केन्द्रीय विद्यालय संगठन
KENDRIYA VIDYALAYA SANGATHAN

शिक्षा एवं प्रशिक्षण का आंचलिक संस्थान, चंडीगढ़
ZONAL INSTITUTE OF EDUCATION AND TRAINING, CHANDIGARH

अध्ययन सामग्री / Study Material

शैक्षिक सत्र / Session - 2022-23

कक्षा / Class – ग्यारहवीं / XII

विषय / Subject - अर्थशास्त्र / ECONOMICS

विषय कोड / Subject Code - 030

तैयारकर्ता - सेवाकालीन प्रशिक्षण कार्यक्रम के प्रतिभागियों
(स्नातकोत्तर शिक्षक, अर्थशास्त्र) द्वारा

Prepared By - PARTICIPANTS OF IN-SERVICE COURSE
(PGT, ECONOMICS)

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निदेशक महोदय का संदेश

विद्यार्थियों की शैक्षिक प्रगति को ध्यान में रखते हुए उपयोगी अध्ययन सामग्री उपलब्ध कराना हमारा महत्त्वपूर्ण उद्देश्य है। इससे न केवल उन्हें अपने लक्ष्य को प्राप्त करने में सरलता एवं सुविधा होगी बल्कि वे अपने आंतरिक गुणों एवं अभिरुचियों को पहचानने में सक्षम होंगे। बोर्ड परीक्षा में अधिकतम अंक प्राप्त करना हर एक विद्यार्थी का सपना होता है। इस संबंध में तीन प्रमुख आधार स्तंभों को एक कड़ी के रूप में देखा जाना चाहिए- अवधारणात्मक स्पष्टता, प्रासंगिक परिचितता एवं आनुप्रयोगिक विशेषज्ञता।

राष्ट्रीय शिक्षा नीति 2020 के उद्देश्यों की मूलभूत बातों को गौर करने पर यह तथ्य स्पष्ट है कि विद्यार्थियों की सोच को सकारात्मक दिशा देने के लिए उन्हें तकनीकी आधारित समेकित शिक्षा के समान अवसर उपलब्ध कराए जाएँ। बोर्ड की परीक्षाओं के तनाव और दबाव को कम करने के उद्देश्य को प्रमुखता देना अति आवश्यक है।

यह सर्वमान्य है कि छात्र-छात्राओं का भविष्य उनके द्वारा वर्तमान कक्षा में किए गए प्रदर्शन पर ही निर्भर करता है। इस तथ्य को समझते हुए यह अध्ययन सामग्री तैयार की गई है। उम्मीद है कि प्रस्तुत अध्ययन सामग्री के माध्यम से वे अपनी विषय संबंधी जानकारी को समृद्ध करने में अवश्य सफल होंगे।

शुभकामनाओं सहित।

मुकेश कुमार
(उपायुक्त एवं निदेशक)

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ECONOMICS (Code No. 030) (2022-23)

Rationale

Economics is one of the social sciences, which has great influence on every human being. As economic life and the economy go through changes, the need to ground education in children's own experience becomes essential. While doing so, it is imperative to provide them opportunities to acquire analytical skills to observe and understand the economic realities.

At senior secondary stage, the learners are in a position to understand abstract ideas, exercise the power of thinking and to develop their own perception. It is at this stage, the learners are exposed to the rigour of the discipline of economics in a systematic way.

The economics courses are introduced in such a way that in the initial stage, the learners are introduced to the economic realities that the nation is facing today along with some basic statistical tools to understand these broader economic realities. In the later stage, the learners are introduced to economics as a theory of abstraction.

The economics courses also contain many projects and activities. These will provide opportunities for the learners to explore various economic issues both from their day-to-day lifeand also from issues, which are broader and invisible in nature. The academic skills that they learn in these courses would help to develop the projects and activities. The syllabus is also expected to provide opportunities to use information and communication technologies tofacilitate their learning process.

Objectives:

- Understanding of some basic economic concepts and development of economic reasoning which the learners can apply in their day-to-day life as citizens, workers and consumers.
- Realisation of learners' role in nation building and sensitivity to the economic issues that the nation is facing today.
- Equipment with basic tools of economics and statistics to analyse economic issues. This is pertinent for even those who may not pursue this course beyond senior secondary stage.
- Development of understanding that there can be more than one view on any economic issue and necessary skills to argue logically with reasoning.

ECONOMICS (030)
CLASS – XI (2022-23)

Theory: 80 Marks *3 Hours*

Project: 20 Marks

Units		Marks	Periods
Part A	**Statistics for Economics**		
	Introduction	15	10
	Collection, Organisation and Presentation of Data		30
	Statistical Tools and Interpretation	25	50
		40	
Part B	**Introductory Microeconomics**		
	Introduction	04	10
	Consumer's Equilibrium and Demand	15	40
	Producer Behaviour and Supply	15	35
	Forms of Market and Price Determination underperfect competition with simple applications	06	25
		40	
			200
Part C	**Project Work**	**20**	**20**

Part A: Statistics for Economics

In this course, the learners are expected to acquire skills in collection, organisation and presentation of quantitative and qualitative information pertaining to various simple economic aspects systematically. It also intends to provide some basic statistical tools to analyse, and interpret any economic information and draw appropriate inferences. Inthis process, the learners are also expected to understand the behaviour of various economic data.

Unit 1: Introduction *10 Periods*

What is Economics?

Meaning, scope, functions and importance of statistics in Economics

Unit 2: Collection, Organisation and Presentation of data 30 Periods

Collection of data - sources of data - primary and secondary; how basic data is collected with concepts of Sampling; methods of collecting data; some importantsources of secondary data: Census of India and National Sample Survey Organisation.

Organisation of Data: Meaning and types of variables; Frequency Distribution.

Presentation of Data: Tabular Presentation and Diagrammatic Presentation of Data:

(i) Geometric forms (bar diagrams and pie diagrams), (ii) Frequency diagrams (histogram, polygon and Ogive) and (iii) Arithmetic line graphs (time series graph).

Unit 3: Statistical Tools and Interpretation **50 Periods** For all the numerical problems and solutions, the appropriate economic interpretation may be attempted. This means, the students need to solve the problems and provide interpretation forthe results derived.

Measures of Central Tendency- Arithmetic mean, median and mode

Correlation – meaning and properties, scatter diagram; Measures of correlation - KarlPearson's method (two variables ungrouped data) Spearman's rank correlation.

Introduction to Index Numbers - meaning, types - wholesale price index, consumer price index and index of industrial production, uses of index numbers; Inflation and index numbers.

Part B: Introductory Microeconomics

Unit 4: Introduction ***10 Periods***

Meaning of microeconomics and macroeconomics; positive and normative economics

What is an economy? Central problems of an economy: what, how and for whom to produce; concepts of production possibility frontier and opportunity cost.

Unit 5: Consumer's Equilibrium and Demand **40 Periods**

Consumer's equilibrium - meaning of utility, marginal utility, law of diminishing marginal utility, conditions of consumer's equilibrium using marginal utility analysis.

Indifference curve analysis of consumer's equilibrium-the consumer's budget (budget set and budget line), preferences of the consumer (indifference curve, indifference map) and conditions of consumer's equilibrium.

Demand, market demand, determinants of demand, demand schedule, demand curve and its slope, movement along and shifts in the demand curve; price elasticity of demand - factors affecting price elasticity of demand; measurement of price elasticity ofdemand – percentage-change method and total expenditure method.

Unit 6: Producer Behaviour and Supply ***35 Periods***

Meaning of Production Function – Short-Run and Long-Run

Total Product, Average Product and Marginal Product.

Returns to a Factor

Cost: Short run costs - total cost, total fixed cost, total variable cost; Average cost; Average fixed cost, average variable cost and marginal cost-meaning and their relationships.

Revenue - total, average and marginal revenue - meaning and their relationship. Producer's equilibrium-meaning and its conditions in terms of marginal revenue-marginal cost. Supply, market supply, determinants of supply, supply schedule, supplycurve and its slope, movements along and shifts in supply curve, price elasticity ofsupply; measurement of price elasticity of supply - percentage-change method.

Unit 7: Forms of Market and Price Determination under Perfect Competition with simple applications. ***25 Periods***

Perfect competition - Features; Determination of market equilibrium and effects ofshifts in demand and supply.

Simple Applications of Demand and Supply: Price ceiling, price floor.

Part C: Project in Economics 20 Periods

Guidelines as given in class XII curriculum

Suggested Question Paper DesignEconomics (Code No. 030)

Class XI (2022-23)

March 2023 Examination

Marks: 80 **Duration: 3 hrs.**

SN	Typology of Questions	Marks	Percentage
1	**Remembering and Understanding**: Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, givingdescriptions, and stating main ideas	44	55%
2	**Applying**: Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in adifferent way.	18	22.5%
3	**Analysing, Evaluating and Creating:** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations. Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. Compile information together in a different way by combining elements in a new pattern or proposingalternative solutions.	18	22.5%
	Total	**80**	**100%**

Guidelines for Project Work in Economics (Class XI and XII)

The **objectives** of the project work are to enable learners to:

- probe deeper into theoretical concepts learnt in classes XI and XII
- analyse and evaluate real world economic scenarios using theoretical constructs andarguments
- demonstrate the learning of economic theory
- follow up aspects of economics in which learners have interest
- develop the communication skills to argue logicallyThe **expectations** of the project work are that:
- learners will complete only **ONE** project in each academic session
- project should be of 3,500-4,000 words (excluding diagrams & graphs), preferablyhand-written
- it will be an independent, self-directed piece of study

Role of the teacher:

The teacher plays a critical role in developing thinking skills of the learners. A teacher should:

- help each learner select the topic based on recently published extracts from the news media, government policies, RBI bulletin, NITI Aayog reports, IMF/World Bank reports etc., after detailed discussions and deliberations of the topic
- play the role of a facilitator and supervisor to monitor the project work of the learnerthrough periodic discussions
- guide the research work in terms of sources for the relevant data
- educate learner about plagiarism and the importance of quoting the source of theinformation to ensure authenticity of research work
- prepare the learner for the presentation of the project work
- arrange a presentation of the project file

Scope of the project:

Learners may work upon the following lines as a suggested flow chart:

Choose a title/topic

↓

Collection of the research material/data

↓

Organization of material/dataPresent

↓

material/data

↓

Analysing the material/data for conclusion

↓

Draw the relevant conclusion

↓

Presentation of the Project Work

Expected Checklist:

- Introduction of topic/title
- Identifying the causes, consequences and/or remedies
- Various stakeholders and effect on each of them
- Advantages and disadvantages of situations or issues identified
- Short-term and long-term implications of economic strategies suggested in the course ofresearch
- Validity, reliability, appropriateness and relevance of data used for research work andfor presentation in the project file
- Presentation and writing that is succinct and coherent in project file
- *Citation of the materials referred to, in the file in footnotes, resources section, bibliography etc.*

Mode of presentation/submission of the Project:

At the end of the stipulated term, each learner will present the research work in the Project Fileto the External and Internal examiner. **The questions should be asked from the Research Work/ Project File of the learner. The Internal Examiner should ensure that the study submitted by the learner is his/her own original work.** In case of any doubt, authenticity should be checked and verified.

Marking Scheme :

Marks are suggested to be given as –

S. No.	Heading	Marks Allotted
1.	Relevance of the topic	3
2.	Knowledge Content/Research Work	6
3.	Presentation Technique	3
4.	Viva-voce	8
	Total	20 Marks

Suggestive List of Projects:

Class XI	
• Effect on PPC due to various governmentpolicies	• Invisible Hand (Adam Smith)
• Opportunity Cost as an Economic Tool(taking real life situations)	• Effect of Price Change on a Substitute Good (taking prices from real life visiting localmarket)
• Effect on equilibrium Prices in Local Market(taking real life situation or recent news)	• Effect of Price Change on a ComplementaryGood (taking prices from real life visiting local market)
• Solar Energy, a Cost Effective Comparisonwith Conventional Energy Sources	• Bumper Production- Boon or Bane for theFarmer
• Any other newspaper article and its evaluation on basis of economic principles	• **Any other topic**

STATISTICS FOR ECONOMICS-

'*Study of mankind in the ordinary business of life' -Prof.* Marshall.

- Economics is a social science that studies the production, distribution and consumption of goods and services. Economics focuses on the behaviour and interaction of economic agents and how economies work.
- Adam Smith is considered as 'the father of economics' and the name of his book is ' An inquiry *into the nature and causes of the wealth of nations'*.

STATISTICS

- The word 'Statistics' is used in both its singular as well as its plural senses
- In the singular sense, statistics may be defined as the science of collection, presentation, analysis and interpretation of numerical data.
- In the plural sense, statistics means numerical facts or observations collected with a definite purpose. For example, the income and expenditure of a person in a particular locality, number of males and females in a particular town, are statistics.

Statistics in Economics

Statistics play a major role in economics. Statistics helps in the study of market structure and understanding the different economic problems.

After a better understanding of the economic problems, statistics also help in solving those issues by formulating appropriate economic policies.

Every economics branch takes the help of statistics to prove different economic theories. One can also establish a mathematical relationship with the help of statistics.

Economists can present the facts of economics precisely. They can also determine the cause and effect relationship between different data sets.

Functions of Statistics

- Simplification of complex facts:
- Presentation of facts in the definite form:
- Comparisons of facts:
- Forecasting:
- Formulation and hypothesis testing
- Enlarging individual knowledge and experience:
- Importance of Statistics in Business

- Statistics provide different guidelines and tools to know the feasibility, location, inputs availability, taxes, size of output, turnover, market size, etc., before establishing a business.
- A businessman can estimate the demand for their service or product with the help of different statistical methods such as trend analysis, etc.
- Statistics also help a business in the production planning process to ensure a proper balance between the supply and demand for a good or service offered by the firm.
- Different statistical techniques help a business in the analysis of purchasing power, consumer wants, pricing, population, etc., to understand the potential of the target market for their service or product.

Limitations of Statistics

- It ignores the qualitative aspect:
- It does not deal with individual terms:
- It requires only uniform and homogeneous data:
- It can be misused:
- Its results are true only on average

COLLECTION OF DATA

Sources of Data :There are two sources of data

Primary Source of Data: It implies collection of data from its source of origin.

Secondary Source of Data: It implies collection of data from some agency or institution which already happens to have collected the data through statistical survey.

Types of Data

There are two types of data

- Primary Data: Primary Data collected by the investigator for his own purpose for the first time, from beginning to end are called primary data.
- Secondary Data: These data have already been collected by somebody else; these are available in the form of published or unpublished reports.

Principal Differences between Primary and Secondary Data

- Primary data are original and secondary data are already in existence and therefore, are not original.
- Primary data do not need any adjustment, secondary data need to be adjusted to suit the objective of study in hand.
- Primary data is expensive and secondary data is less expensive.

Statistical Methods of Data Collection

(i) Direct Personal Investigation

It is the method by which data is personally collected by the investigator from the information. Merits and demerits of this method are as follows.

Merits:

- Originality
- Reliability
- Uniformity
- Accuracy
- Related information
- Elastic

Demerits:

- Difficult to cover wide areas
- Costly
- Personal bias
- Limited coverage

(ii) Indirect Oral Investigation

It is the method by which information is obtained not from the persons regarding whom the information is needed. It is collected orally from other persons who are expected to possess the necessary information. Merits and demerits of this method are given below:

Merits:

- Wide coverage
- Expert opinion
- Simple
- Less expensive
- Free from bias

Demerits:

- Less accurate
- Doubtful conclusions
- Biased

(iii) Information from Local Sources or Correspondents

Under this method, the investigator appoints local persons or correspondents at different places. Merits and demerits of this method are given below.

Merits:

- Economical
- Wide coverage
- Continuity
- Suitable for special purpose

Demerits:

- Loss of originality
- Lack of uniformity
- Personal bias
- Less accurate
- Delay in collection

(iv) Information Through Questionnaires and Schedules

PROPERTIES OF GOOD QUESTIONNAIRE

- **Limited Number of questions,**
- **Proper sequence of questions,**
- **Simplicity, Instructions,**
- **No undesirable questions,**
- **Non-controversial question,**
- **Avoid Calculations ,**
- **Objective-type questions ,**

There are two ways of collecting information on the basis of questionnaire:

(a) Mailing Method: Under this method questionnaires are mailed to the informants. The method is most suited when

- The area of the study is very wide.
- The informants are educated.

(b) Enumerator's Methods: Under this Method enumerator himself fills the schedules after seeking information from the informants. This method is mostly used when

- The field of investigation is large.
- The investigation needs specialised and skilled investigation.
- The investigators are well versed in the local language and cultural norms of the informants.

Collection of Secondary Data

There are two main sources of secondary data:

- Published sources
- Unpublished sources

Published Sources :Some of the published source of secondary data are:

- Government publication
- Semi-government publication
- Reports of committees and commissions
- Publications of trade associations
- Publication of research institutions
- Journals and papers
- Publication of research scholars
- International publication

Unpublished Sources: These data are collected by the government organisations and others, generally for their self-use or office record.

Reliability, Suitability and Adequacy of the data

In order to assess the reliability, suitability and adequacy of the data, the following points must be kept in mind,

- Ability of the collecting organisation
- Objective and scope
- Method of collection
- Time and condition of organisation
- Definition of the unit
- Accuracy

Census 'Method

Census method is that method in which data are collected covering every item of the universe or population relating to the problem under investigation. Merits and demerits of this method are given follows:
Merits:

- Reliable and accurate
- Less biased
- Extensive information
- Study of diverse characteristic
- Study of complex investigation
- Indirect investigation

Demerits:

- Costly
- Large manpower
- Not suitable for large investigation

Sample Method

It is that method in which data is collected about the sample on a group of items taken from the populations for examination and conclusions are drawn on their basis. Merits and demerits of this method are given below:

Merits:

- Economical
- Time saving
- Identification of error
- Large investigation
- Administrative convenience
- More scientific

Demerits:

- Partial
- Wrong conclusions
- Difficulty in selecting representative sample
- Difficulty in framing a sample
- Specialised knowledge

Methods of Sampling:

(i) Random Sampling: Random sampling is that method of sampling in which each and every item of the universe has an equal chance of being selected in the sample. Random sampling may be done in any of the following ways:

- Lottery method
- Tables of random number

(ii) Purposive or Deliberate Sampling: It is that method in which the investigator himself makes the choice of the samples items which in his opinion are the best representative of the universe.

(iii) Stratified or Mixed Sampling: According to this method of sampling, the population is divided into different strata having different characteristics and some of the items are selected from each strata, so the entire population gets represented.

(iv) Systematic Sampling: According to these methods, units of the population are numerically, geographically and alphabetically arranged. Every nth item of the numbered is selected as a sample item.

(v) Quota Sampling: In this method, the population is divided into different groups or classes according to different characteristics of the population.

(vi) Convenience Sampling: In this method, sampling is done by the investigator in such a manner that suits his convenience.

Reliability of Sampling Data

It depends mainly on the following factors:

- Size of the sample
- Method of sampling
- Bias of correspondents and enumerators
- Training of enumerators

Census of India

It is an important source of secondary data in India. Every 10 years, a house to house survey is carried out, covering all households in India and demographic data on birth rate, literacy, workforce, life expectancy, size and composition of population etc. are collected. This is known as the Census of India. The data collected is published by the Registrar General & Census Commissioner of India. The last Census of India was held in February, 2011.

National Sample Survey Organisation (NSSO)

National Sample Survey Organisation (NSSO): Reports and publications of NSSO are another source of secondary data in India. The NSSO was established by the Government of India to conduct regular sample surveys on socio-economic issues. They provide periodic estimates of literacy, school enrolment, employment & unemployment, manufacturing and service sector enterprises, maternity, child care, utilisation of public distribution system, to name of few.

(EXERCISE)

Q1. Define economics.

Ans. Economics is a social science that studies the production, distribution and consumption of goods and services. Economics focuses on the behaviour and interaction of economic agents and how economies work

.

Q2. Who is known as the ‘father of economics’?

Ans. Adam Smith is considered as ‘the father of economics’.

Q3. Define Statistics in singular sense as well as plural sense.

Ans. In the singular sense, statistics may be defined as the science of collection, presentation, analysis and interpretation of numerical data.

In the plural sense, statistics means numerical facts or observations collected with a definite purpose. For example, the income and expenditure of a person in a particular locality, number of males and females in a particular town, are statistics.

Q4. Explain any three points of importance of statistics in economics.

Ans.

- Statistics play a major role in economics. Statistics helps in the study of market structure and understanding the different economic problems.
- After a better understanding of the economic problems, statistics also help in solving those issues by formulating appropriate economic policies.
- Every economics branch takes the help of statistics to prove different economic theories. One can also establish a mathematical relationship with the help of statistics.
- Economists can present the facts of economics precisely. They can also determine the cause and effect relationship between different data sets.

Q5. Write any three properties of a good questionnaire.

Ans.

- Limited Number of questions,
- Proper sequence of questions,
- Simplicity, Instructions,
- No undesirable questions,
- Non-controversial question,
- Avoid Calculations ,
- Objective-type questions ,

Q6. Distinguish between primary data and secondary data.

Ans.

- Primary data are original and secondary data are already in existence and therefore, are not original.
- Primary data do not need any adjustment, secondary data need to be adjusted to suit the objective of study in hand.
- Primary data is expensive and secondary data is less expensive.

Q7. Distinguish between census method and sample method.

Ans.

Census method is that method in which data are collected covering every item of the universe or population relating to the problem under investigation. This method is :- Reliable and accurate, Less biased, Extensive information, Study of diverse characteristics, Study of complex investigation.

Sample method is that method in which data is collected about the sample on a group of items taken from the populations for examination and conclusions are drawn on their basis. This method is:- Economical, Time saving, Large investigation, More scientific.

Q8. Write a note on ‘Census of India’ and ‘NSSO’.

Ans. National Sample Survey Organisation (NSSO): Reports and publications of NSSO are another source of secondary data in India. The NSSO was established by the Government of India to conduct regular sample surveys on socio-economic issues. They provide periodic estimates of literacy, school enrolment, employment & unemployment, manufacturing and service sector enterprises,

maternity, child care, utilisation of public distribution system, to name of few.

Q9. Write the sources of secondary data.

Ans. Published Sources :Some of the published source of secondary data are:

- Government publication
- Semi-government publication
- Reports of committees and commissions
- Publications of trade associations
- Publication of research institutions
- Journals and papers
- Publication of research scholars
- International publication

Unpublished Sources: These data are collected by the government organisations and others, generally for their self-use or office record.

Q10. Write about the way of data collection through questionnaire methods.

Ans. There are two ways of collecting information on the basis of questionnaire:

(a) Mailing Method: Under this method questionnaires are mailed to the informants. The method is most suited when:

- The area of the study is very wide.
- The informants are educated.

(b) Enumerator's Methods: Under this Method enumerator himself fills the schedules after seeking information from the informants. This method is mostly used when:

- The field of investigation is large.
- The investigation needs specialised and skilled investigation.
- The investigators are well versed in the local language and cultural norms of the informants.

Organization of Data

Meaning: Organization of the data refers to the arrangement of figures in such a form that comparison of the mass of similar data maybe facilitated and further analysis may be possible.

Concept of variable

A characteristic which is capable of being measured and changes its value overtime is called a variable

Types of variable

1. Discrete variable
2. Continuous variable

Discrete variables are those variables that increase in jumps or incomplete number for example the number of students in class 11th could be 1, 2,3,10, 11, 15 or 20 etc.

Continuous variable: Variables that assume a range of values or increase not in jumps but continuously or infractions are called continuous variable for

example height of the boys in a school is expressed as 5'1", 5’2", 5’3", and so on.

Frequency distribution

It is that series in which items cannot be exactly measured. The items assume a range of values and preplaced within the range of limit. In other words, data are classified into different classes with a range the range is called class intervals.

Types of frequency distribution

1. Exclusive series exclusive series is that series in which every class interval excludes items corresponding to its upper limit.
2. Inclusive series is that series which includes all items up to its upper limit.
3. Open end series: An open and series is that series in which lower limit of the first class interval and the upper limit of last class interval is missing.
4. Cumulative frequency series: we frequency series is that series in which the frequencies are continuously added corresponding to each class interval in the series.
5. Mid value frequency series: Mid value frequency series are those series in which we have only mid values of the class intervals and the corresponding frequencies.

Presentation of data: Tabular presentation

A statistical table is a systematic organisation of data in columns and rows.

Components of a table

1. Table number: first of all, a table must be number different table must have different number for example 1, 2, 3 etc.
2. Title: A table must have a title. Title must be written in bold letters.
3. Head note: If the title of the table does not give complete information it is supplemented with a head note.
4 Stubs: Stubs are the titles of the rows of a table these titles indicate information contained in the rows of the table.
5. Caption: Caption is the title given to the columns of a table. A caption indicates information contained in the columns of the table.
6. Body or field body of a table means some total of the items in the table does body is the most important part of a table.
7. Footnotes: Footnotes are given for the clarification of the reader these are generally given when information in the table needs to be supplemented.
8. Source: When tables are based on secondary data source of the data is to be given source of the data is specified below the footnote.

Format of a Table

Table Number: …….

Title: …….

[Head note]

Stub	Caption				Total [Rows]
	Sub-head				
	Column Head	Column Head	Column Head	Column Head	
Stub entries	←	BODY	→		
Total [colums]					

7. Footnote
8. Source

Merits of tabular presentation:

1 Tabular presentation is perhaps the simplest form of data presentation.

2. The tabulation facilitates comparison of data by presenting the data in different classes.

3. It is very easy to analysis the data from table.

4. Tabulation highlights characteristics of data.

5. Tabular presentation is a very economical mod of data presentation.

Diagrammatic Presentation Of Data

Bar Diagrams and Pie Diagrams.

Bar diagrams: Bar diagrams are those diagrams in which data are presented in the form of bars or rectangles. Bars are also called columns.

Types of Bar diagrams

1. **Simple Bar Diagram**: Simple bar diagrams are those diagrams which are based on a single set of numerical data.

2. **Multiple Bar Diagram**: Multiple Bar diagrams are those diagrams which show two or more sets of data simultaneously.

3. **Components Bar Diagram**: Component Bar diagrams are those diagrams which simultaneously present, total values as well as part values of a set of data.

4. **Percentage Bar Diagram**: Percentage Bar diagrams are those diagrams which show simultaneously different parts of the values of a set of data in terms of percentage.

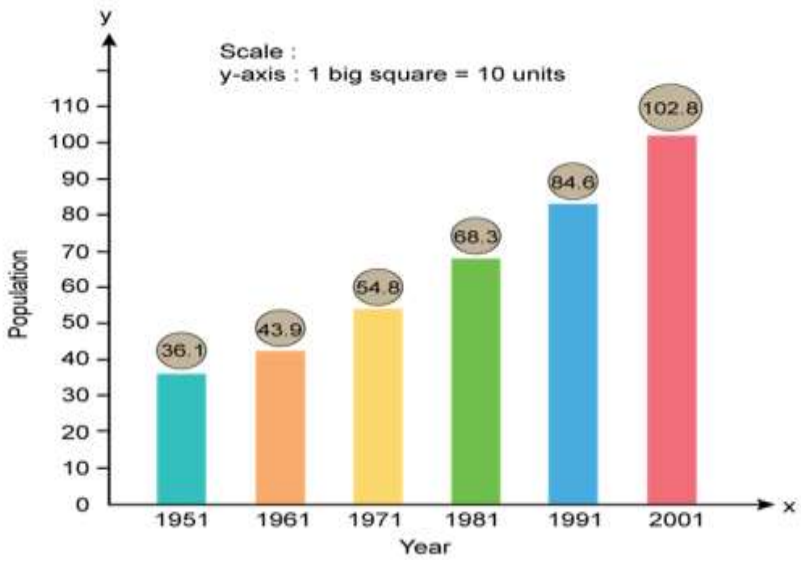
5. **Deviation Bar Diagrams**: Deviation Bar diagrams are used to compare the net deviation of related variables with respect to time and location.

Prepare a Bar Diagram using following information's.

Population of India (In crores)

Year	1951	1961	1971	1981	1991	2001
Population	36.1	43.9	54.8	68.3	84.6	102.8

Population of India (In crores)



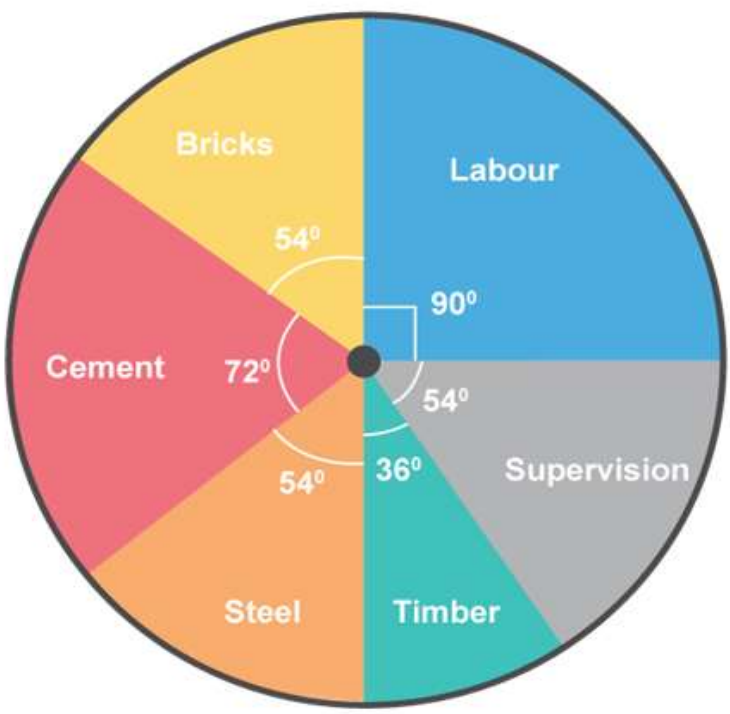
Pie or Circular Diagrams:

Pie diagram is a circle divided into various segments showing the percentage value of a series this diagram does not show absolute value.

Prepare a Pie diagram using following information

Item	Percentage Share	Share in terms of degree
Labour	25	Degree share of Labour = $\frac{25}{100} \times 360 = 90°$
Bricks	15	Degree share of Bricks = $\frac{15}{100} \times 360 = 54°$
Cement	20	Degree share of Cement = $\frac{20}{100} \times 360 = 72°$
Steel	15	Degree share of Steel = $\frac{15}{100} \times 360 = 54°$
Timber	10	Degree share of Timber = $\frac{10}{100} \times 360 = 36°$
Supervision	15	Degree share of Supervision = $\frac{15}{100} \times 360 = 54°$

Pie diagram



Frequency Diagrams- Histogram, Polygon and Ogive.

Frequency diagrams related to diagrammatic presentation of frequency distribution. In such series values of a variable repeat themselves number of items.

Histogram: Histogram is a graphical presentation of a frequency distribution of a continuous series. While constructing histogram values of the variable are shown on the X-axis and their frequencies on the Y- axis.

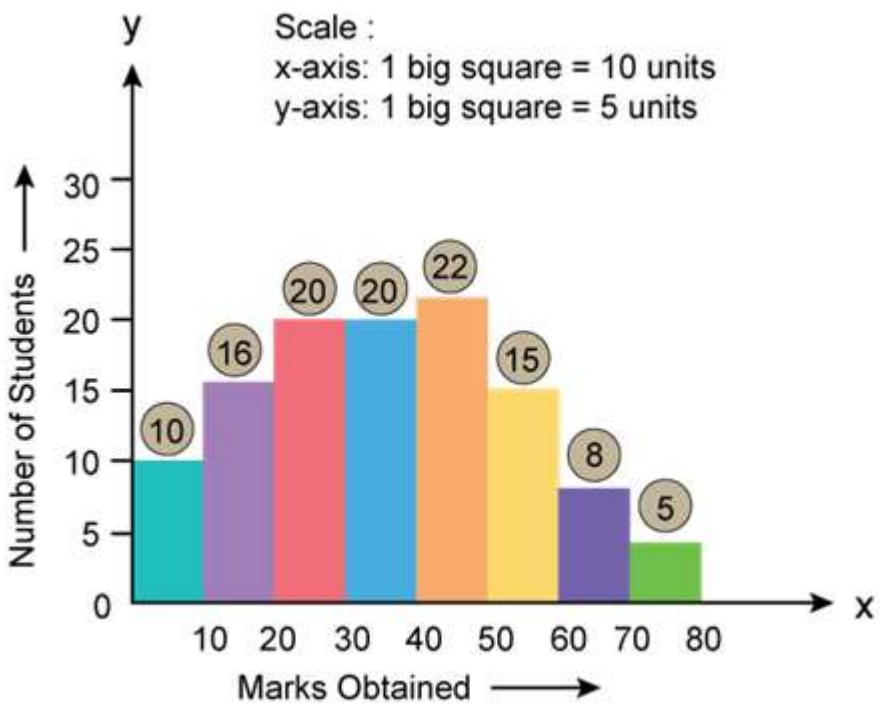
Types of Histograms:

1. Histograms of equal class intervals: Histograms of equal class intervals are those which are based on the data with equal class intervals.

2. Histograms of unequal class interval: A histogram of unequal class interval is the one which is based on the data with unequal class intervals.

Prepare a Histogram using following information's.

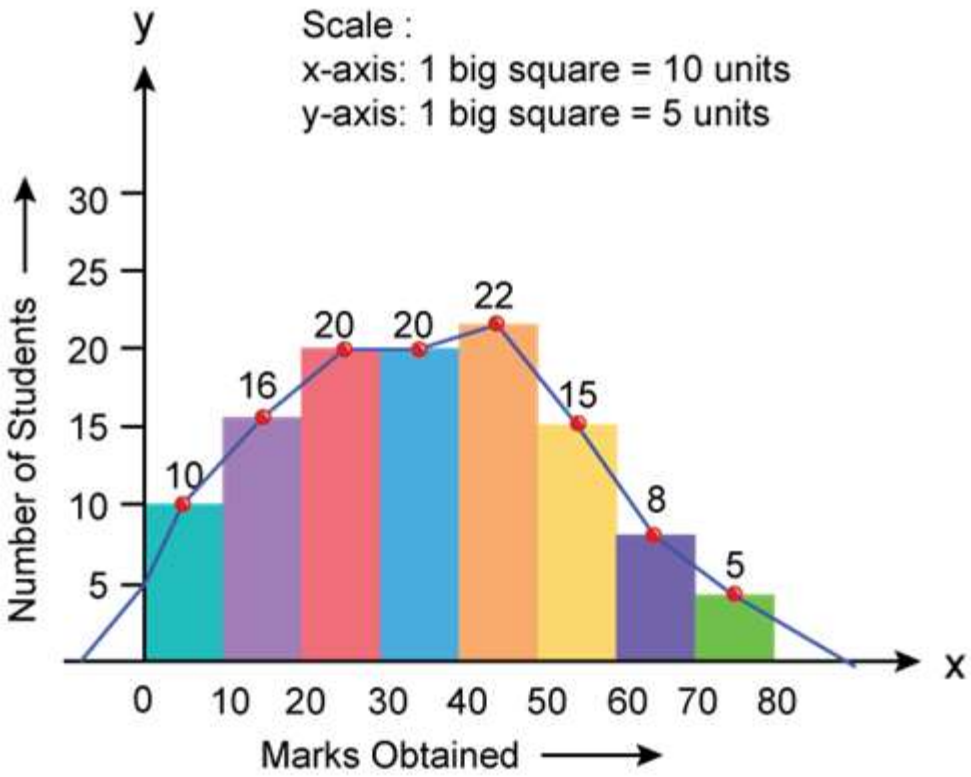
Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	10	16	20	20	22	15	8	5



Frequency Polygon: Frequency polygon is another form of diagrammatic presentation of data. It is formed by joining mid-points of the tops of all rectangles in a histogram. However a polygon can be drawn even without constructing a histogram.

Prepare a Frequency Polygon using following information's.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	10	16	20	20	22	15	8	5



Ogive Curve:

Ogive or cumulative frequency curve is the curve which is constructed by plotting cumulative frequency data on the graph paper, in the form of a smooth curve.

A cumulative frequency curve may be constructed in two ways:

1. **Less Than Method**: In this method, beginning from upper limit of the first class interval we go on adding the frequencies corresponding to every next upper limit of the series.

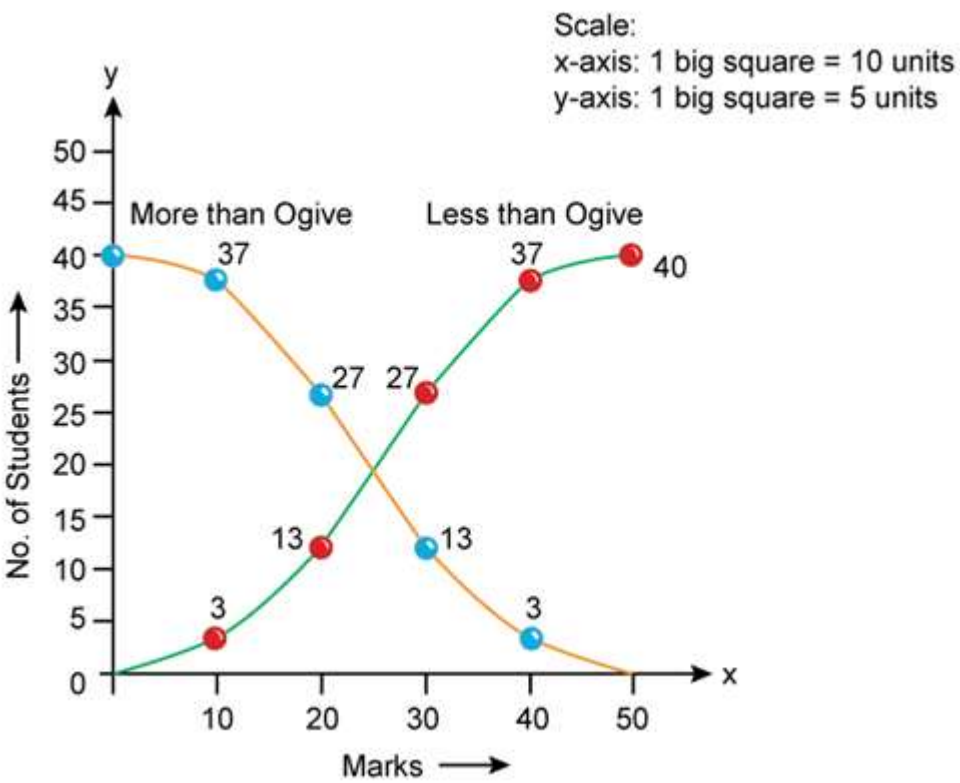
2. **More Than Method**: In this method, we take cumulative total of the frequencies beginning with lower limit of the first class interval.

Prepare a Ogive curve using following information's.

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	3	10	14	10	3

Marks	Cumulative Frequency
Less than 10	**3**
Less than 20	**3 + 10 = 13**
Less than 30	**13 + 14 = 27**
Less than 40	**27 + 10 = 37**
Less than 50	**37 + 3 =40**

Marks	Cumulative Frequency
More than 0	40
More than 10	40 - 3 = 37
More than 20	37 + 10 = 27
More than 30	27 + 14 = 13
More than 40	13 + 10 = 3



Arithmetic line- Graphs or Time series graphs

When is set of statistical data are presented on a graph paper, it is called a graph.

Rules for constructing a graph:

1. Every graph must have a suitable and precise heading.
2. One should fix an appropriate scale on which data should be presented.
3. As far as possible, length of x-axis on the graph paper should be one and a half times the length of y-axis.
4. It would be useful to give the table of data along with the graph of the data.
5. The construction of diagrams should flow from left to right or from bottom to the top.
6. Diagrams or graphs must suit the size of the paper.

Merits of Diagrammatic And Graphic Presentation

1. No need of training or specialized knowledge.
2. Attractive and effective means of presentation of data.
3. A quick comparative glands possible.
4. Diagrammatic or graphic presentation leaves a lasting impact on the reader's mind.
5. Graphs make information simple and understandable.

Prepare one variable graph using following information's.

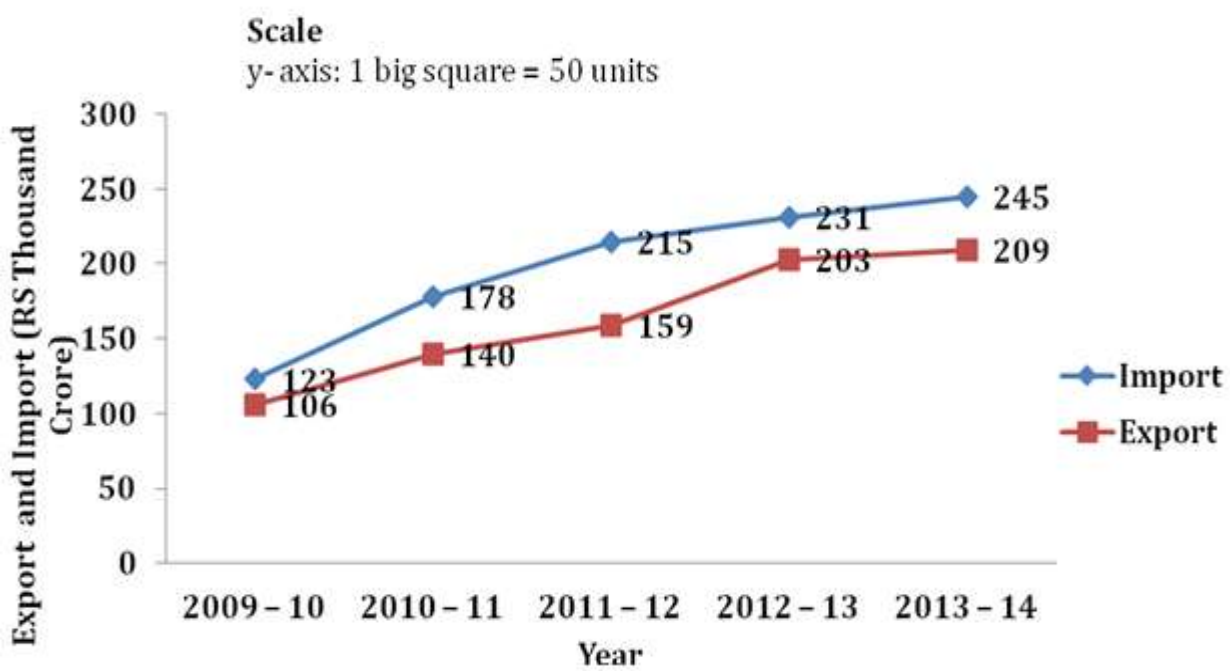
Profit of firm	60	72	75	65	80	95
Year	2009	2010	2011	2012	2013	2014

Annual Profit of a Firm (In crores)

Prepare two variable graphs using following information's.

Imports	123	178	215	231	245
Exports	106	140	159	203	209
Year	2009-10	2010-11	2011-12	2012-13	2013-14

Export and Import



Section-A (One marks questions)

1. What do you mean by classification of data?

Ans. Classification is grouping of data according to their identity, similarity or resemblances.

2. Assertion (A): Classification is the process of arranging data into sequence and groups. Reason (R): Data are classified according to their common characteristics for separating them into different but related parts.

(a)Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A)

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true

Answer: (A)

3. The class midpoint is equal to:

a) The average of the upper class limit and the lower class limit

b) The product of upper class limit and the lower class limit

c) The ratio of the upper class limit and the lower class limit

d) None of these

Answer: (A)

4. The characteristic of fact that can be measured in the form of numbers is called:

a)Frequency b) variable

c) Attribute d) none of these

Answer: (d)

5. Which statistical measures can be determined with the help of ogives?

(a)Mean (b) median

(c) Mode (d) Mean Deviation

Answer: (b)

6. The graph of a cumulative frequency distribution is called?

(a) Ogive (b) frequency curve

(c) Arithmetic line graph (d) Histogram

Answer: (a)

7. Which of the following Diagrams can be Made with the help of Histogram?

(a) Ogive (b) Bar Diagram

(c) Frequency Polygon (d) pie chart

Answer: (c)

State whether the following statements are True or False from questions 8-10

8. Graphic presentation helps to identify correlation between the variables

9. Horizontal line from left to right on a graph is called ordinate

10. One variable graph does not necessarily show the values of only one variable with respect to some time period.

Answer from 8-10 8 True 9 False 10 False.

11.The most attractive method of data presentation is:

(a) Diagrammatic (b) Textual

(c) Tabular (d) Either (a) or (b)

12. In a bar diagram, the bars are:

(a) Horizontal (b) Vertical

(c) Either (a) or (b) (d) None of the above

13. Diagrammatic representation of data is done by:

(a) Pictures (b) Charts

(c) Diagrams (d) All these

14. Sub-divided bar diagram is used to:

(a) Study relation between different components

(b) Compare different components of a variable

(c) Either (a) or (b)

(d) Both (a) and (b)

15. The most appropriate diagram to represent the data relating to the monthly expenditure on different items by a family is:

(a) Histogram (b) Pie diagram

(c) Angular Circle Diagram (d) Line graph

16. When for some countries, the magnitudes are small and for other, the magnitudes are very large, to portray the data, it is preferred to construct:

(a) Deviation bar diagram

(b) Duo-directional bar diagram

(c) Broken-Scale bar diagram

(d) Any of the above

17. In case of……all the bars are of equal height and width.

(a) Multiple Bar Diagram (b) Percentage Bar Diagram

(c) Sub-divided Bar Diagram (d) Simple Bar Diagram

18. In a Pie Diagram, 1% value of data is represented by an angle at the center equal to:

(a) 3.6° (b) 36° (c) 360° (d) 0.36°

19. The diagram which represents data in a circle is known as:

(a) Pie Diagram (b) Multiple Diagram

(c) Bar Diagram (d) Sub-divided bar Diagram

20. If a household spends 70% of his income on food, then degree measure of an angle in the pie diagram will be:

(a) 200° (b) 210° (c) 252° (d) 70°

Answers from 11-20 : 11 (a) 12 (c) 13 (d) 14 (d) 15 (b) 16 (c) 17 (b) 18 (a) 19 (a) 20 (c)

Section-B (Three marks questions)

1. Can there be any advantage in classifying things? Explain with examples

Ans- Yes, there are many advantages of classifying thing

1.It saves our time and energy by making easy to locate a specific data.

2.It facilitates the analysis, tabulation and interpretation.

3. It is also easy to summarize.

2. What are the main types of one-dimensional diagrams?

Ans. (1) Simple Bar Diagram; (ii) Multiple Bar Diagram; (i) Sub-Divided Bar Diagram; (iv) Percentage Diagram; (v) Broken-Scale Bar Diagram; (vi) Deviation Bar Diagram.

3.Fill in the blanks

(i) In a simple table, data is presented according to …….. characteristic only.

(ii) Heading and sub headings given to column of a table are called……

(iii) In case of tabulation, ……refer to the headings of horizontal rows.

Ans: (i) one (ii) captions (iii) title

4.Write the general rules for constructing of a graph. (any three)

Ans: 1. Every graph must have a suitable and precise heading.

2. One should fix an appropriate scale on which data should be presented.

3. As far as possible, length of x-axis on the graph paper should be one and a half times the length of y-axis.

Section-C (Four marks questions)

1.What is a variable? Distinguish between a discrete variable and a continuous variable.

Ans. A characteristic, number or quantity whose value changes overtime is called variable. For eg. weight, income etc. It can be either discrete or continuous

Discrete Variable	Continuous Variable
A variable that takes only whole number as its value is called discrete variable	A variable that can take any value, within a reasonable limit is called a continuous variable
These variables increases in jumps or in complete numbers	These variables assume a range of values or increase in fractions and not in jumps.
For example number of people in a family, number of students in a class	For example-age, height, weight etc

2. Case Based Questions-

50 students were asked to choose their Favourite sport these are the results.

SPORT	CRICKET	FOOTBALL	HOCKEY	BASKETBALL	TENNIS
NO.OF STUDENTS	12	10	11	9	8

The data is to be illustrated in a pie chart.

Q.1 what angle should be used for football. (a) 36° (b) 72° (c) 90° (d) 10°

Q.2 In which form a data presented in a pie diagram? (a) Percentage (b) Degrees (C) Absolute values (d) table

Q.3 In a pie diagram/circle 1% is equal to..... (a) 1 (b) 3.6 (c) 36 (d) 10

Q.4 what angle should be used for tennis. (a) 8° (b) 57.6° (c) 28.8° (d) 64°

Case study Answers: Q.1-b,Q.2-a,Q.3-b,Q.4-b

3. Identify the correct sequence of alternatives given in Column II by matching them with respective items in Column 1:

Column 1	Column II
(i) Exclusive series	(a) Upper limit of the last class interval is missing
(ii) Discrete variables	(b) Frequency values are expressed as percentages of the total frequency
(iii) Open-end series	(c) Qualitative dimension
(iv) Relative frequency	(d) Assume values in complete numbers
(v) Attribute	(e) Value of the upper limit of a class interval is not included in that class

Answers: (i)-(e), (ii)-(d), (iii)-(a), (iv)-(b), (v)-(c)

4.What is statistical classification? What is the importance of such a classification?

5. The strength of a school from 2015-2019 are given below. Represent the data by a simple bar diagram.

Year	2015	2016	2017	2018	2019
Strength of school	500	600	500	700	750

6. Draw the graph of interest on deposits for a year:

Deposits	10000	20000	30000	40000	50000
Interest	750	1500	2350	3300	4400

Section-D (Six marks questions)

1. Briefly explain the components of a statistical table with a suitable format.
2. Explain how a time series graph is prepared? Also distinguish between one variable and two variable time series graph.
3. Prepare histogram and frequency polygon from the following data:

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	5	8	15	11	6	4

4. Draw the 'less than' and 'more than' ogive curve on the basis of following information.

Wages	0-20	20-40	40-60	60-80	80-100
No. of workers	10	20	40	20	10

MEASURES OF CENTRAL TENDENCY

Important Term and Concepts:

1. Average: It is a value which is typical or representative of a set of data. Averages are also called Measures of Central Tendency.
2. Functions of Average:
   - i] Presents complex data in a simple form.
   - ii] Facilitates comparison.
   - iii] Helps government to form policies.
   - iv] Useful in Economic analysis.
3. Essentials of a good Average:
   - i. Simple to calculate.
   - ii. It should be easy to understand.
   - iii. Rigidly defined.
   - iv. Based on all items of observation.
   - v. Least affected by extreme values.
   - vi. Capable of further algebraic treatment.
   - vii. Least affected by sampling fluctuation.
   - viii. Graphic measurement possible.
4. **Types of Averages:**
   - i. Arithmetic Mean
   - ii. Median
   - iii. Mode
   - iv. Quartiles
5. **Arithmetic Mean (X)**

   It is the most common type of measures of central tendency.

   It is obtained by dividing the sum of all observation in a series by the total number of observation.
6. **Calculation of Arithmetic Mean:**

	Individual Series	Continuous Series
Direct Method	$X = \frac{\sum X}{N}$	$X = \sum fx / \sum f$
Assumed Mean Method	$X = A + \sum X / N$	$X = A + \sum fd / \sum f$
Step Deviation Method	$X = A + \frac{\sum d' \mathbf{x\ i}}{N}$	$X = A + \frac{\sum fd'}{\sum f} \times i$

7. **Merits of Arithmetic Mean:**

1]Easy to calculate

2]Simple to understand

3]Based on all observations

4]Capable of further mathematical calculations.

Demerits:

1]Affected by extreme values.

2] Cannot be calculated in open-end series. 3] Cannot be graphically ascertained.

4]Sometimes misleading or absurd result.

8. Weighted Arithmetic Mean:

Values to be arranged are given varying importance.

$$XW = \frac{\sum WX}{\sum W}$$

Where Xw = Weighted Arithmetic Mean

W = Weight

X = Values of the variables

9. **Median (M)**

It is defined as the middle value of the series, when the data is arranged in ascending or descending order.

Calculation of Median

For Individual & Discrete Series

M = Size of $\frac{(N+1)}{2}^{th}$ item

Continuous series

Median Item = size of $(N/2)^{th}$ item. $M = L_1 + \frac{N/2 - c.f}{f} \times i$

Merits

1. Easy to understand and easy to compute.
2. Not underlay affected by extreme observation.
3. It can be located graphically.
4. Appropriate average in case of open end classes.

Demerits:

1. Not based on all observations.
2. It requires arrangement of data.
3. Not capable o further algebraic treatment.

11. Mode (Z)

It is the value which occurs the most frequently in a series.

Calculation of Mode

i. Individual Series :

ii. By observation identify the value that occurs most frequently in a series.

iii. By conversion into discrete series and then identify the value corresponding to which there is highest frequency.

Discrete Series:

i. By Inspection Method.

ii. Grouping Method: By preparing Grouping Table and then preparing Analysis table.

Continuous Series:

i. Determination of Modal class by Inspection Method or Grouping table and Analysis table.

ii. Applying the formula

$$Z = L_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i$$

OR

$$Z = L1 + \frac{D_1}{D_1 + D_2} \times i$$

Merits of Mode

i. It is easy to understand and simple to calculate.

ii. Not affected by extreme values.

iii. Can be located graphically.

iv. Easily calculated in case of open-end classes.

Demerits of Mode

i. Not rigidly defined.

ii. If mode is ill defined, mathematical calculation is complicated.

iii. Not based on all items.

iv. Not suited to algebraic treatment.

12. Relationship between Mean Median and Mode

i. In case of symmetrical distribution

Mean = Median = Mode

ii. In case of asymmetrical distribution

Mode = 3 Median – 2 Mean

MCQ/1 mark conceptual questions

1. The single value which represents the entire universe is called

(a.) Central tendency (b.) Range

(c.) Index Number (d.) Histogram

2. In calculation of _____, all items are given equal importance.

(a.) Simple arithmetic means (b.) Weighted arithmetic mean

(c.) Median (d.) Mode

3. To calculate arithmetic mean by direct method in individual series, we use _____ formula.

(a.) $\Sigma X / N$ (b.) $\Sigma fX / N$

(c.) $\Sigma fm / N$ (d.) $A + \Sigma fd / N$

4.Total of given variables is given by _____.

(a.) ΣfX (b.)$\Sigma X / N$ (c.) Σfd (d.) Σfm

5. Which average is the most suitable in the case of calculating average Intelligence of students in a class?

(a.) Mode (b.) Mean

(c.) Median (d.) Median and Mode

6. Which average is affected by extreme values?

(a.) Mean (b.) Mode

(c.) Median (d.) None of the above

7. The values which has the greatest frequency in a series is called

(a.) Quartile (b.)Median (c.)Mode (d.) Mean

8. The value which divides a series into 4 equal parts

(a.) Median (b.) Quartile

(c.) Decile (d.) Percentile

9. The following values can be located through graph:

(a.) Mode (b.) Mean

(c.) Weighted mean (d.) Combined mean

Answers:

1. (a) 2. (a) 3. (a) 4. (b) 5. (c) 6. (a) 7. (c) 8. (b) 9. (a)

Conceptual Questions:

1. Give the meaning of central tendency.

Ans. It is the single value which represents the characteristics of the entire Universe.

2. Define arithmetic mean.

Ans. It is defined as the sum of the values of all observations divided by the number of observations

3. Name three most commonly used averages

Ans. These are: Arithmetic mean, median and mode

4. Name two positional mesures of central tendency.

Ans.(a) Median (b) Mode

5. Define median.

Ans. It is the values which divides a series into more than two equal parts. The partition values are : quartiles, deciles and percentiles.

6. Define quartiles, deciles and percentiles.

Ans.Quartiles. These divide the series into 4 equal parts. There are three quartiles; Q1, Q2 and Q3.Q2 are same as median.

Deciles. These divide the series into 10 equal parts. There are 9 deciles; D_1, D_2 and D_9.$D_5$are same as median.

Percentiles. These divide the series into 100 equal parts. There are 99 percentiles; P_1, P_2 and P_{99}.$P_{50}$are same as median.

7. Define mode.

Ans. Mode is defined as that value which occurs most frequently in the distribution.

8. What is the relationship between Mean, median and mode?

Ans. Mode = 3Median – 2Median

3/4 marks questions (FAQ)/VALUE BASED

1. *Two companies using arithmetic mean give their average profits as Rs. 3 Lakh for the same year. A statistical expert intends to rate their performance. Which qualitative values will help him in his task?*

   Ans. Though statistically correct, only qualitative data may not be sufficient to rate a company‟s performance. Qualitative aspects such as **honesty, cleverness, enterprising nature, business ethics**etc. cannot be measured quantitatively using arithmetic mean. Hence he should also consider the above qualitative aspects as well as to rate the performance.

2. *Following table give distribution of income in a factory:*

Income (Rs.)	0-1000	1000-2000	2000-3000	3000-4000	4000-5000
No. of workers	10	20	45	22	3

   Which average do you suggest to study the data given on income distribution? Which values does the average exhibit?

   Ans. In such cases, where income distribution is unequal, middle value or median is the most **trusted average**. Median is the most representative figure as half the income earners must be **earning at least the median income**. Values which are exhibited by median are exhibited by median are justice, study of qualitative aspects like **equality, inclusiveness** etc.

HOTS questions

1. **How is arithmetic mean calculated in specific cases?**

   Ans. Other than regular class – intervals (continuous series), there are specific cases in which arithmetic mean is calculated as discussed under:

1. ***When mid values are given.*** There is no need to convert the mid-values in continuous series. We will calculate arithmetic mean as usual.

2. ***When inclusive class intervals are given.*** We may/may not convert inclusive series into exclusive series, to calculate mean.(However it is advisable to convert into exclusive series, to be in practice).
3. ***When Cumulative series are given.*** When values of the variables are given in

   „Less than‟ or „More than‟ types, we need to convert these into a simple frequency series.

4. *When unequal class-intervals are given.* In such cases, arithmetic mean is calculated in the usual manner after finding mid-values of each class-interval.

5. *When open-end class intervals are given.* Mean can be calculated after finding missing class limits which are assumed after studying the pattern of class intervals.

2. What is the meaning of term "Central tendency"? How is it useful?

Ans. It is a value around which values of a variable concentrate. It is the value which is capable to represent the series. Central tendency is very useful in statistical analysis because:

1. It represents the entire group.
2. It can be used to facilitate statistical analysis.
3. It helps in comparing one set of data with another set of data.
4. It helps in decision making and formulating plans in various areas of business activities, economic planning etc.

Q-3 "Mode is the most commonly used measure" why?

Ans. Mode has practical utility. It is very useful to traders as it helps them in decision making regarding modal wage, size etc. When we need to use average income, average wages, average size of shoes, average per capita expenditure, we refer to most frequently used item i.e. mode. Now a days, modal output, imports, exports etc. are determined by mode. Mode is also used to forecast rainfall, temperature etc. That is why we say that mode is the most commonly used measure.

Measures of Dispersion is not included in 2022-23 Syllabus. This topic is included in study material for Knowledge purpose only

MEASURES OF DISPERSION

1. Dispersion refers to the variation of the items around an average.
2. Objectives of Dispersion
   a) To determine the reliability of an average.
   b) To compare the variability of two or more series.
   c) It serves the basis of other statistical measures such as correlation etc.
   d) It serves the basis of statistical quality control.

   Properties of good measure of Dispersion
   a) It should be easy to understand.
   b) Easy to calculate.
   c) Rigidly defined
   d) Based on all observations.
   e) Should not be unduly affected by extreme values.

Measures of Dispersion may be either absolute measures or relative measure.

Absolute Measures of Dispersion are

a) Range
b) Quartile Deviation
c) Mean Deviation
d) Standard Deviation

Relative Measures of Dispersion are

a) Coefficient of Range
b) Coefficient of Quartile Deviation
c) Coefficient of Mean Deviation
d) Coefficient of Variation

Graphical method of dispersion

Lorenz Curve

Range

It is the difference between the largest and smallest value of distribution.

Computation of Range

Range = L – S

Coefficient of Range = $\frac{L - S}{L + S}$

Merits of Range

1.It is simple to understand and easy to calculate.

2.It is widely used in statistical quality control.

Demerits of Range

1.It is affected by extreme values in the series.

2.It cannot be calculated in case of open end series. 3.It is not based on all items.

Inter quartile range and quartile deviation

Inter quartile range is the difference between Upper Quartile (Q_3) and Lower Quartile Q_1. Quartile deviation is half of inter quartile range.

Computation of Inter quartile range and quartile deviation Inter quartile Range = $Q3 - Q_1$

Quartile Deviation Q.D = $\frac{Q_3 - Q_1}{2}$

Coefficient of Q.D = $\frac{Q_3 - Q_1}{Q_3 + Q_1}$

Merits of Q.D

1.Easy to compute

2.Less affected by extreme values.

3.Can be computed in open ended series.

Demerits of Q.D

1.Not based on all observations

2.It is influenced by change in sample and suffers from instability.

Mean Deviation

Mean Deviation is defined as the arithmetic average of the absolute deviations [ignoring signs] of various items from Mean or Median.

Computation of Mean Deviation Individual Series

$$M.D = \frac{\Sigma|D|}{N}$$

Discrete/Continuous Series

$$M.D = \frac{\Sigma f|D|}{\Sigma f}$$

Coefficient of M.D = $\frac{M.D}{\bar{X} \text{ or Median}}$

Merits of Mean Deviation

1. Based on all observations.

2. It is less affected by extreme values.

3. Simple to understand and easy to calculate.

Demerits of Mean Deviation

1. It ignores ± signs in deviations.

2. It is difficult to compute when deviations comes in fractions. Standard Deviation: (σ)

It is defined as the root mean square deviation. Features of Standard Deviation:

1. Value of its deviation is taken from Arithmetic Mean.

2. + and – signs of deviations taken from mean are not ignored. Related Measures of Standard Deviation

Standard deviation = σ

Coefficient of standard deviation: $\frac{\sigma}{\bar{X}}$

Variance = σ^2

Coefficient of variation = $\frac{\sigma}{\bar{X}} \times 100$

Computation of σ

Individual Series

1. $\sigma = \sqrt{\frac{\Sigma x^2}{N}}$ Actual Mean Method

$x = X - \bar{X}$

2. $\sigma = \sqrt{\frac{\Sigma d^2}{N} - \left(\frac{\Sigma d}{N}\right)^2}$ Assumed Mean Method

Discrete / Continuous Series:

i. $\sigma = \sqrt{\frac{\Sigma fx^2}{\Sigma f}}$ Actual Mean Method

$x = X - \bar{X}$

ii. $\sigma = \sqrt{\frac{\Sigma fd^2}{\Sigma f} - \left(\frac{\Sigma fd}{\Sigma f}\right)^2}$ Assumed Mean Method

iii. $\sigma = \sqrt{\frac{\Sigma fd^{12}}{\Sigma f} - \left(\frac{\Sigma fd^{1}}{\Sigma f}\right)^2}$ Step Deviation Method

Merits of Standard Deviation

i. Rigidly defined

ii. Based on all observations

iii. Takes Algebraic signs in consideration

iv. Amenable to further Algebraic treatment

Demerits

i. Difficult to understand and compute.

ii. Affected by extreme items.

Lorenz Curve

It is a graphical method of studying dispersion.

Lorenz curve is a cumulative percentage curve in which the percentage of frequency is combined with percentage of other items such as profit, income etc.

MCQ/1 mark conceptual questions

1.Variance is square of:

(b.) Mean deviation (b.) Standard deviation

(c.) Mode (d.) All the above

2. Inter-Quartile range is the difference between

(a.) Median and Mode (b.)Mean and Mode

(c.) Upper quartile and lower quartile (d.) None of the above

3.Graphic method to find dispersion is

(a.) Mode (b.) Median (c.) Ogive(d.) lorenze Curve

Answers:

1. (b) 2. (c) 3. (d)

Conceptual Questions:

1. What is dispersion? Why it is measured?

Ans. Dispersion measures the extent to which different items tend to disperse away from an average (measure of central tendency). The basic objective related to the measurement of dispersion is to know the variation between the actual values of the items and an average value of the items of a series.

2. Differentiate between absolute measures of dispersion and relative measures of dispersion.

Ans. Absolute measures of dispersion are measured in terms of the original units of a series whereas relative measures of dispersion are measured as a ratio or percentage of the average.

3/4 marks questions (FAQ)/VALUE BASED

1. *A batsman is to be selected for a cricket team. The choice is between X And Y on the basis of their five previous scores, which are as follows:*

X	25	85	40	80	120
Y	50	70	65	45	80

Which batsman should be selected if we want: (a) a higher run scorer (b) a more reliable batsman? Which value makes him reliable?

Ans. (Students can refer illustration 38 of chapter 11)

a. Batsman X is a higher run scorer as his average score is more that of Y.

b. Batsman Y is **more reliable** as his performance shows **less variation**. He is reliable because he is more **consistent or focused**.

HOTS questions

1. Mention Characteristics of mean deviation

Ans. We should note the following characteristics of the mean deviation:

(i.) It is rigidly defined.

(ii.) It depends on the values of the variable.

(iii.) It is based on absolute deviations from a central value

(iv.) It is easy to understand.

(v.) It involves harder calculations than the range and quartile deviation.

(vi.) It is amenable to algebraic treatment.

(vii.) The units of measurement of the mean deviation are the same as those of the variable (X).

2. Mention characteristics of standard deviation

Ans. The characteristics of standard deviation are :

(i.) It is rigidly defined

(ii.) It is based on all observations of the series.

(iii.) It is capable of further algebraic treatment.

(iv.) It has sampling stability

(v.) It gives more weightage to extreme values.

CORRELATION

Important terms and concepts

Correlation studies the relationship between tow variables in which change in the value of one variable causes change in the other variable. **It is denoted by letter „r".**

Kinds of correlation:-

1. Positive and Negative correlation.
2. Linear and non – linear correlation.
3. Simple and multiple correlations.

Positive correlation: When both variables move in the same direction. If one increases other also increases and vice-versa.

Negative correlation: -When two variables move in the opposite direction, they are negatively correlated.

Linear Correlation: -When two variables change in a constant proportion.

Non- linear correlation: -When two variables do not change in the same proportion.

Simple correlation – Relationship between two variables are studied.

Multiple Correction – Relationship between three or more than three variables are studied.

Degrees of Correlation:

1. **Perfect Correlation -** When values of both variables changes at a constant rate Types – (a) Perfect positive correlation – when values of both variables changes at a constant ratio in the same direction correlation coefficient value (r) is + 1

   (b) Perfect negative correlation – When values of both the variables change at a constant ratio in opposite direction. Value of coefficient of correlation is -1
2. **Absence of correlation :** When there is no relation between the variables r = 0
3. **Limited degree correlation :** The value of r varies between more than O and less than 1

Types - a) High : r his between ± 0.7 & 0.999

b) Moderate = r lies between ± 0.5 and + 0.699

c) Low: r < ± 0.5

Different methods of finding correlation

a) Karl Pearson"s coefficient method

b) Rank method / Spearman"s coefficient method

c) Scatter Diagram

(A) **Karl Pearson"s Method**

$$r = \frac{\Sigma xy}{N\sigma \times \sigma y}$$

Where X = X – X, Y = Y – Y

N = number of observations

σ X = Standard deviation of series X

σ Y = Standard deviation of series Y

OR

Actual Mean Method

$$R = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \times \Sigma y^2}}$$

Where x = X – X, y = Y – Y

Assumed Mean Method

$$r = \frac{\Sigma dxdy - \left(\frac{\Sigma dx \times \Sigma dy}{N} \right)}{\sqrt{\Sigma dx^2 - \frac{(\Sigma dx^2)}{N}} \sqrt{\Sigma dy^2 - \frac{(\Sigma dy^2)}{N}}}$$

Where dx = X – A

dy = Y – A

A = assumed mean

Merits of Karl Pearson"s Method

1. Helps to find direction of correlation
2. Most widely used method

Demerits of Karl Pearson"s method

1. Based on large number of assumptions
2. Affected by extreme values

(B) **Spearmans"s Rank Correlation Method**

Formula

In case of non-repeatedranks :-

$$r_s = 1 - \frac{6\Sigma D^2}{N^3 - N}$$

r_s = Spearman"s rank correlation

ΣD^2 = Sum of squares of difference of ranks N = Number of observation

In case of repeated ranks:-

$$r_S = 1 - \frac{6\Sigma D^2 + \frac{1}{12}(m^3 - m) + \frac{1}{12}(m^3 - m)}{N^3 - N}$$

M = number of items with repeated ranks.

Merits of Spearman"s Rank Correlation

1. Simple and easy to calculate
2. Not affected by extreme values

Demerits of Spearman"s Rank Correlation

1. Not Suitable for grouped data
2. Not based on original values of observations.

(C) Scatter Diagram – Given data are plotted on a graph paper. By looking at the scatter of points on the graph, degree and direction of two variables can be found.

Merits of Scatter Diagram

1. Most simplest method.
2. Not affected by size of extreme values.

Demerits

1. Exact degree of correlation cannot be found.

MCQ/1 mark conceptual questions

1. When we study correlation between only two variables, it is called:

(c.) Partial (b.) Simple(c.) Multiple (d.) Double

2. The degree of perfect positive correlation is

(a.) Zero (b.) +1 (c.) -1 (d.) 0 to 1

3. The range of simple correlation coefficient is

(a.) 0 to infinity (b.) o to minus one

(c.) Minus one to plus one (d.) Plus one to infinity

Answers:

1. (b) 2. (b) 3. (c)

Conceptual Questions:

1. What is correlation?

Ans. Correlation analysis studies the relation between two variables

2. Name the methods used to measure Correlation, also define them briefly

Ans. There are *three* methods:

(i.) Scatter diagrams: Scatter diagrams give a visual presentation of the nature of relationship between two variables.

(ii.) *Karl Pearson's coefficient of correlation (r)*: It measures numerically only linear relationship between two variables. Coefficient of correlation (r) lies between -1 and +1.

(iii.) *Spearman's rank correlation coefficient* : When the variable cannot be measured precisely, this method can be used to measure the linear relationship numerically by assigning ranks to the values of the variables

3/4 marks questions (FAQ)/VALUE BASED

1. *An economist finds negative relation between price of petrol and its demand. Which value from such study is brought to front, which will guide the economy to find solution?*

Ans. If this study of correlation shows inverse relation between price and demand of petrol, it will reveal to the economist the connection by which the disturbance (-ve relation) happen and may guide him the path through which **stabilizing forces may become effective** so that the corrective measures can be taken.

INDEX NUMBERS

1. **Meaning**: Index numbers is a statistical tool for measuring relative change in a group of related variables over two or more different times.
2. **Features of an Index Number**
   a. They are expressed in percentages.
   b. They are special types of averages.
   c. They measure the effect of change over a period of time.
3. **Problems in construction of Index Numbers**
   a. Defining the purpose of index numbers
   b. Selection of items
   c. Selection of base period
   d. Selection of prices
   e. Selection of weights
   f. Choice of an average
   g. Choice of the formulae
4. **Price index are of two types**
   a. Simple Index Number
   b. Weighted price Index numbers
5. **Construction of simple Index Numbers:-**
   There are two methods
   a. Simple aggregate Method

$$P_{01} = \frac{\sum P_1}{\sum P_0} \times 100$$

   b. Simple Average of price relative method

$$P_{01} = \frac{\sum (P_1 / P_0 \times 100)}{N}$$

6. **Weighted Index Numbers**
   There are two methods:-
   a. Weighted Aggregate method:- In this method commodities are assigned weights on the basis of quantities purchased.

$$P_{01} = \frac{\sum P_1 Q_0}{\sum P_0 Q_0}$$ (Base year quantities as weight)

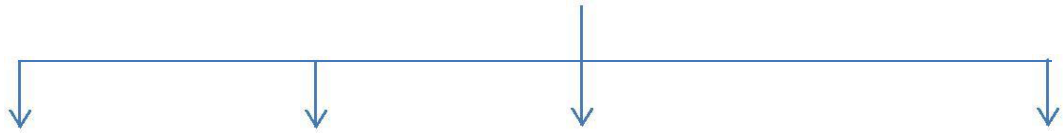
   b. Weighted Average of Price Relative Method:-
   Under this method commodities are assigned weight or the basis of base‟s year value ($W = P_0 Q_0$) or fixed weights (W) are used.

$$P_{01} = \frac{\sum RW}{\sum W}$$

Where $R = \frac{P_1 \times 100}{P_0}$

W = value in the base year ($P_0 Q_0$) or fixed weights

7. Types of Index Numbers



Consumer Price Index (CPI) | Whole Sale Production (WPI) | Index of Industrial (IIP) | SENSEX Price Index

a. **Consumer Price Index:- (CPI)** The methods of constructing CPI are

- **Aggregate Expenditure Method** $P_{01} = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100$

- **Family Budget Method** $P_{01} = \frac{\sum RW}{\sum W}$

Where $R = \frac{P_1 \times 100}{P_0}$

$W = P_0 Q_0$ or fixed weights

8. Uses of Consumer Price Index:- (CPI)

a. It is used in calculating purchasing power of money
b. It is used for grant of Dearness Allowance.
c. It is used by government for framing wage policy, price policy etc.
d. CPI is used as price deflator of income
e. CPI is used as indicator of price movements in retail market.

9. Wholesale Price Index (WPI):-

a. It measures the relative change in the price of commodities traded in wholesale market.
b. It indicates the change in the general price level.
c. It does not include services

Uses of WPI

a. Basis of Dearness Allowance
b. Indicator of changes in economy
c. Measures the rate of inflation

10. Index Number of Industrial Production (IIP)

It indicates the changes in level of Industrial production or a percentage change in physical volume of output of commodities in following industries

a. Mining
b. Quarrying

c. Manufacturing
d. Electricity etc.,

Formula IIP= $\frac{\sum (q_1 / q_0).\ W}{\sum W}$

W = relative importance of different output. q_0 = Base year quantity.
q_1= Current Year Quantity.

11. Uses of Index Numbers.

a. Helps us to measure changes in price level
b. Help us to know changes in cost of living
c. Help government in adjustment of salaries and allowances
d. Useful to Business Community
e. Information to Politicians
f. Information regarding foreign trade

12. SENSEX

SENSEX is the short form of Stock Exchange Sensitive Index with 1978-79 as base. It is a useful guide for the investors in the stock market. It deals with 30 stocks represented by 13 sectors of the economy.

List of formulae and Abbrivations used in the Construction of Index Numbers:

List of Formulae

1.) Unwighted Index Numbers

a. Simple aggregative method

$\mathbf{P_{01}} = \Sigma p_1 / \Sigma p_0 \times 100$

b. Simple average of Price Relatives Method

$\mathbf{P_{01}} = (\Sigma p_1 / \Sigma p_0 \times 100) / N$

2.) Weighted Index Numbers

a. Weighted aggregative method

i. *Laspeyre's Method* $p01 = (\Sigma p_1 q_0 / \Sigma p_0 q_0) \times 100$

ii. *Paasche's Method* $p01 = (\Sigma p_1 q_1 / \Sigma p_0 q_1) \times 100$

iii. *Laspeyre's Method* $p01 = \sqrt{((\Sigma p_1 q_0 / \Sigma p_0 q_0) \times (\Sigma p_1 q_1 / \Sigma p_0 q_1))} \times 100$

iv.

b. Weighted Average of Price Relatives Method

$p01 = (\Sigma RW / \Sigma W)$ Where $R = p_1 / p_0 \times 100$

3.) Consumer Price Index (CPI)

a. Aggregate Expenditure Method

$$CPI = (\Sigma p_1 q_0 / \Sigma p_0 q_0) X$$

100 **b. Family Budget Method**

$$CPI = p01 = (\Sigma RW / \Sigma W) \text{ Where } R = p_1 / p_0 \times 100 \text{ and } W = p_0 q_0$$

4.) Index of Industrial Production

IIP_{01}(Index number of industrial production)

$$= (\Sigma W(q_1/q_0) / \Sigma W)$$

MCQ/1 mark conceptual questions

1. The technique of measuring relative changes in the variables Related to base year

(a.) Index Numbers (b.) Standard deviation

(c.) Correlation (d.) Dispersion

2.Consumer price index is also known as:

(a.) Family Budget (b.) Cost living index

(c.) Wholesale price index (d.) Dispersion

3.Index number is

(a.) expressed in percentage (b.) expressed in fractions

(c.) expressed in decimals (d.) expressed in square

Answers:

1.(a) 2. (b) 3. (a)

Conceptual Questions:

1. Define Index number.

Ans. An index number is a statistical device for measuring relative change in a large number of items

2. Name the widely used index numbers.

Ans. Widely used index numbers are:

(i.) Wholesale price index
(ii.) Consumer price index
(iii.) Index of industrial production
(iv.) Agricultural production index
(v.) Sensex

3. Mention characteristics of index numbers

Ans. Widely used index numbers are:

(i.) These are special averages
(ii.) These are the measures of relative changes
(iii.) These measure changes in composite and complex phenomenon
(iv.) These form the basis for making comparisons

3/4 marks questions (FAQ)/VALUE BASED

1. *A state government, while formulating policy for compensation to poor to help them bear the cost of inflation does not study Consumer Price Index. It announces compensation as a matter of routine functioning. Can this policy have meaningful implications?*

Ans. No, CPI cannot be ignored.

It determines purchasing power of money and real wages. Without assessing CPI, compensation can‟t be determined.

It will either be an extra **wasteful expenditure** for government or **injustice** to poor people.

HOTS questions

1. **Why is Fisher"s method considered as an ideal method?**

   Ans. Fisher"s method is an ideal method. It is because:

   (i.) The formula used in this method is based on geometric mean and mean is considered to be the best average to construct index numbers.

   (ii.) It is based on variable weights *i.e.,* it gives weightage to quantities of the base year and current year.

   (iii.) It satisfies time reversal test and factor reversal test.

2. "Index numbers are economic barometers". Explain

   Ans. Barometers are used to measure atmospheric pressure. In same the way, index numbers are used to measure the level of economic activities.

   ➔ Consumer price index number shows the impact of change in the price level in cost of living of specific class of consumer.

   ➔ The index number of industrial production measures changes in the level of industrial production

   ➔ The index number of agricultural production measures changes in the level of industrial production.

Interpretation of data

Introduction

Data interpretation refers to the process of using diverse analytical methods to review data and arrive at relevant conclusions. The interpretation of data helps researchers to categorize, manipulate, and summarize the information in order to answer critical questions.

The importance of data interpretation is evident and this is why it needs to be done properly. Data is very likely to arrive from multiple sources and has a tendency to enter the analysis process with haphazard ordering. Data analysis tends to be extremely subjective. That is to say, the nature and goal of interpretation will vary from business to business, likely correlating to the type of data being analysed.

Statistical Tools and Interpretation

Topics	Sub-topics
Measures of Central Tendency	Mean, Median, Mode
Correlation	Karl's Pearson method, meaning etc.
Measures of Dispersion	Standard deviation, range, quartile deviation etc.
Introduction to Index Numbers	Use of index numbers.

Measures of Central Tendency

Meaning	A central tendency refers to a central value or a representative value of a statistical series. According to Clark, “An average is a figure that represents the whole group”.
Types of Statistical Averages	Averages are broadly classified into two categories • Mathematical Averages • Positional Averages
Arithmetic Mean	Arithmetic Mean is the number which is obtained by adding the values of all the items of a series and dividing the total by the number of items. Arithmetic Mean is generally written as X. It may be expressed in the form of following formula Arithmetic Mean Formula $= \frac{x_1 + x_2 + x_3 + \ldots\ldots + x_n}{n}$ **AM = Sum of all Observations/Total Number of Observations**.
Types of Arithmetic Mean	• Simple Arithmetic Mean • Weighted Arithmetic Mean

Methods of Calculating Simple Arithmetic Mean	**Individual Series** **1. Direct Method** $\text{Mean}=\sum X \div N$ **2. Assumed Mean Method** $\text{Mean}= A + (\sum d \div N)$ **Discrete Series** **1. Direct Method** $\text{Mean}= \sum fX/\sum f$ **2. Assumed Mean Method** $\text{Mean}= A + \sum fd/\sum f$ **3. Step Deviation Method** $\text{Mean} = A + (\sum fd'/\sum f)\times C$ $d'=(X-A)/C$ **Frequency Distribution** **1. Direct Method** $\text{Mean} = \sum fX_i/\sum f$ **OR** $\text{Mean} = \sum fm/\sum f$ **2. Assumed Mean Method** $\text{Mean} = A + \sum fd/\sum f$ **3. Step Deviation Method** $\text{Mean} = A + (\sum fd'/\sum f)\times C$
Calculation of Weighted Mean	According to this way, we find weighted mean from the following information $\text{Mean} = \sum WX/\sum W$

Median	The Median is that value of the variable which divides the group into two equal parts, one part comprising all values greater than the Median value and the other part comprising all the values smaller than the Median value".
Calculation of Median	**(a) Individual Series** 1. If the value of **N is odd** then simply the value of **(N+1)/2** th item is median for the data. **2.** If the value of **N is even**, then use this formula: **Median = [size of (N+1)/2 term + size of (N/2 + 1)th term]÷2** **(b) Discrete Series** The first step for calculation of median here also involves arranging the data in ascending or descending order. This is followed by conversion of simple frequencies into cumulative frequencies. Hence another column for cumulative frequency needs to be constructed, wherein the last value is labelled as the value of **N (i.e ∑f).** Next, we need to find the value of (**N+1)/2.** Lastly, the value corresponding to the cumulative frequency just greater than (N+1)/2 is termed as the median for the data. **(c) Frequency Distribution** **Median = l/2 + h/f [N/2 – C]** Here, l = The lower limit of the median class h = size of the class, f = Frequency corresponding to the median class N = Summation of frequencies C = The cumulative frequency corresponding to the class just before the median class

Mode	The value of the variable which occurs most frequently in a distribution is called the mode. According to Croxton and Cowden, " The mode may be regarded as the most typical of a series of value".
Calculation Of Mode	**Mode for Individual Series** In case of individual series, we just have to inspect the item that occurs most frequently in the distribution. Further, this item is the mode of the series. **Mode for Discrete Series** In discrete series, we have values of items with their corresponding frequencies. In essence, here the value of the item with the highest frequency will be the mode for the distribution. **Mode for Frequency Distribution** Lastly, for frequency distribution, the method for mode calculation is somewhat different. Here we have to find a modal class. The modal class is the one with the highest frequency value. The class just before the modal class is called the pre-modal class. Whereas, the class just after the modal class is known as the post-modal class. Lastly, the following formula is applied for calculation of mode: $\textbf{Mode} = l + h\,[(f_1-f_0)/(2f_1-f_0-f_2)]$ Here, l= The lower limit of the modal class f_1 = Frequency corresponding to the modal class, f_2 = Frequency corresponding to the post-modal class, and f_0 = Frequency corresponding to the pre-modal class

Measures of Dispersion

Meaning	"It is the measure of the variation of the item". According to Spiegel, 'The degree to which numerical data tend to spread about an average value is called the variation or dispersion of the data".
Different methods of measuring dispersion are	•Range •Quartile déviation •Mean déviation •Standard déviation
1) Range	Range is the difference between the highest value and the lowest value in a series. **R = H – L or L – S** H or L = Highest or Largest value of series L or S = Lowest or Smallest value of series **Coefficient of range =** $\frac{L-S}{L+S}$
2) Quartile Deviation	Quartile deviation is half of inter quartile range. $Q.D. = \frac{Q_3 - Q_1}{2}$ Where Q.D. = Quartile deviation Q_3 = Third quartile or upper quartile. Q_1 = First quartile of lower quartile Coefficient of quartile deviation= $\frac{Q_3 - Q_1}{Q_3 - Q_1}$

Mean

Mean deviation/average deviation is the arithmetic mean of the deviations of various items from their average (mean, median or mode) generally from the median.

Calculation of mean deviation

Individual Series $$M.D. = \frac{\Sigma |D|}{N}$$

Discrete Series $$M.D. = \frac{\Sigma f |D|}{N}$$

$$\frac{\Sigma f |D|}{N}$$ Continuous Series

Where,
MD = Mean deviation
| D | = Deviations from mean or median ignoring + Signs
N = Number of item (Individual Series)
N = Total number of Frequencies (Discrete and continuous series)
F = Number of frequencies.
Coefficient of mean deviation

Coefficient of Mean Deviation

- Coefficient of mean deviation from Mean
- Coefficient of MD from Median
- Coefficient of MD from Mode

Standard Deviation:

Standard deviation is the best and widely used measure of dispersion. Standard deviation is the square root of the arithmetic mean of the squares of deviation of its items from their arithmetic mean.

Calculation of Standard deviation

1) Actual mean method.

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2}$$

2) Shortcut Method or assumed mean method:

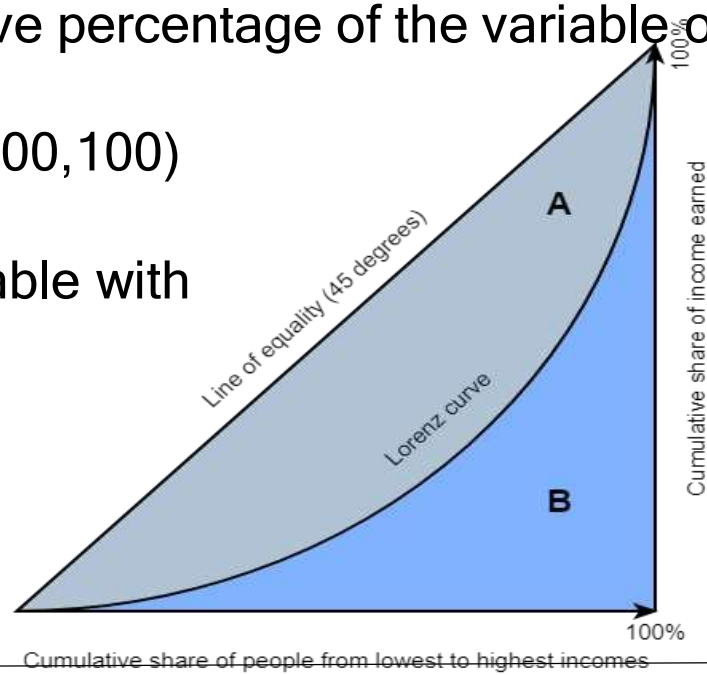
$$\sigma = \sqrt{\frac{\Sigma fd^2}{\Sigma f} - \left(\frac{\Sigma fd}{\Sigma f}\right)^2}$$

Coefficient of variation:

When two or more groups of similar data are to be compared with respect to stability (or uniformly or consistency or homogeneity). Coefficient of variation is the most appropriate measures. It is the ratio of the standard deviation to the mean.

$$CV = \frac{\sigma}{\bar{X}} \times 100$$

Lorenz Curve	It is a curve that shows deviation of actual distribution from the showing equal distribution.
Construction of the Lorenz curve	• Calculate class mid-points • Calculate cumulative frequencies as in column 6 • Express the grand total of column 3 and 6 as 100 and convert the cumulative totals in these columns in to percentage. • Now, on the graph paper, take the cumulative percentage of the variable on Y-axis and cumulative percentages of X-axis. • Draw a line joining co-ordinate (0, 0) with (100,100) • this is called the line of equal distribution. • Plot the cumulative percentages of the variable with • cumulative percentages of frequency. •

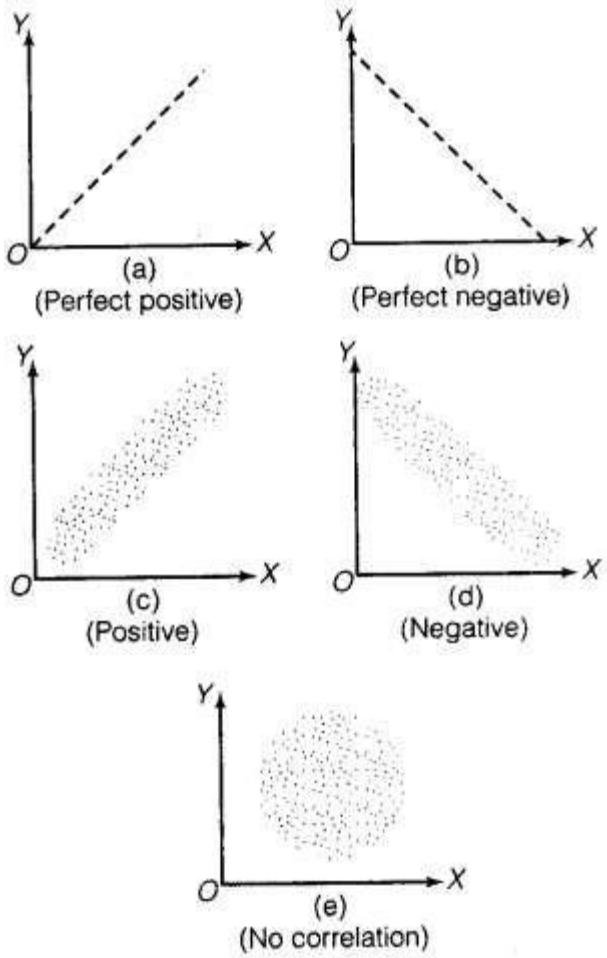


Correlation

Introduction	It is a statistical method or a statistical technique that measures quantitative relationship between different variables, like between price and demand. According to Croxton and Cowden, "When the relationship is of a quantitative nature, the appropriate statistical tool for discovering and measuring the relationship and expressing it in a brief formula is known as correlation."
Types of Correlation	Correlation is commonly classified into negative and positive correlation. • **Positive Correlation-** When two variables move in the same direction, such a relation is called positive correlation, e.g., Relationship between price and supply • **Negative Correlation-** When two variables changes in different directions, it is called negative correlation. Relationship between price and demand.
Degree of Correlation	Degree of correlation refers to the coefficient of correlation (i) Perfect Correlation → Perfect positive (+ 1); Perfect negative (– 1) (i) Absence of Correlation (iii) Limited Degree of correlation The degree of correlation between 0 and 1 may be rated as • High (0.75 and 1) • Moderate (0.25 and 0.75) • Low (0 and 0.25)

Methods of Estimating Correlation

(i) Scatter Diagram- Scattered diagram offers a graphic expression of the direction and degree of correlation.



(2) Karl Pearson's Coefficient of Correlation

This is also known as product moment correlation and simple correlation coefficient.

Karl Pearson has given a quantitative method of calculating correlation Karl Pearson's coefficient correlation is generally written as V.

Formula According to Karl Pearson's method, the coefficient of correlation is measured as

$$r = \frac{\Sigma XY}{N\sigma X \times \sigma Y}$$

σX = S.D. of X series

σY = S.D. of Y series

Where,

r = Coefficient of correlation;

x = x – mean x

y = y- mean y

σ_x = Standard deviation of x series

σ_y = Standard deviation of y series

N= Number of observations

Short-cut Method

This method is used when mean value is not in whole number but in fractions. In this method, deviation is calculated by taking the assumed mean both the series. Coefficient of correlation is calculated using the following formula

$$r = \frac{\Sigma\, dxdy - \frac{(\Sigma\, dx) \times (\Sigma\, dy)}{N}}{\sqrt{\Sigma\, d^2x - \frac{(\Sigma\, dx)^2}{N}} \times \sqrt{\Sigma\, dy^2 - \frac{(\Sigma\, dy)^2}{N}}}$$

Here, d_x = deviation of x series from the assumed mean = (x – A)

d_y = deviation of y series from the assumed mean = (y – A)

Σ dxdy – sum of the multiple of dx and dy

Σ dx^2 = sum of square of dx

Σ dy^2 = sum of square of dy

Σdx= sum of deviation of x-series

Σdy = sum of deviation of y-series

N = Total number of items

Step Deviation Method

Coefficient of correlation is calculated using the following formula

$$r = \frac{dX'\,dY' - \frac{\Sigma d'X \Sigma dY'}{N}}{\sqrt{\left(\Sigma dx^1\right)^2 - \frac{\left(\Sigma dx^1\right)^2}{N} \cdot (\Sigma dy')^2 \frac{(\Sigma dy')^2}{N}}}$$

(3) Spearman's Rank Correlation Coefficient

In 1904, 'Charles Edwards Spearman' developed a formula to calculate coefficient correlation of qualitative variables. It is popularly known as Spearman's rank. Difference formula or method.

Formula

$$r_k = 1 - \frac{6\Sigma D^2}{N^3 - N}$$

Coefficient of Rank Correlation when Ranks are Equal formula

$$r_k = 1 - \frac{6\left[\Sigma D^2 + \frac{1}{12}(m_1^3 - m_1) + \frac{1}{12}(m_2^3 - m_2) + \ldots\right]}{N^3 - N}$$

Here, m = number of items of equal ranks.

Importance or Significance of Correlation

- The study of correlation shows the direction and degree of relationship between the variables.
- Correlation coefficient some times suggests cause and effect relationship.
- Correlation analysis facilitates business decisions because the trend path of one variable may suggest the expected changes in the other.
- Correlation analysis also helps policy formulation.

Index Number

Introduction to index number:	An index number is a statistical device for measuring changes in the magnitude of a group of related variables. It represents the general trend of diverging ratios from which it is calculated. According to Croxton and Cowden, “Index numbers are devices for measuring difference in the magnitude of a group of related variables.”
Features of Index Number	• Index numbers are expressed in terms of percentages. However, percentage sign (%) is never used. • Index numbers are relative measurement of group of data. • Index numbers offer a precise measurement of the quantitative change in the concerned variables over time. • Index number show changes in terms of averages. • They are expressed in numbers. • Index number facilitates the comparative study over different time period.
Importance of Index number	1. It serves as a barometer for measuring the value of money. 2. Gives knowledge about change in standard of living. 3. It helps the business community in planning their decision. 4. Helpful to determine the rate of premium.

Limitation of Index Number	1. Limited applicability 2. International comparison is not possible 3. Limited coverage 4. Difficulty in the construction of index number
Types of Index numbers	(i) Wholesale price index (WPI) (ii) Consumer price index (CPI) or Cost of living index (iii) Index of industrial production (IIP) (iv) Index of Agricultural production (IAP) (v) Sensex
Methods of constructing index numbers	a. Simple Aggregative Method b. Simple Average of Price Relatives Method 2. Construction of weighted Index numbers a. weighted Average of Price Relative Method b. Weighted Aggregative Method
Simple Aggregative Method	$P_{01} = \frac{\Sigma P_1}{\Sigma P_0} \times 100$ Here, P_{01} = Price index of the current year. ΣP_1 = Sum of the prices of the commodities in the current year ΣP_0 = Sum of the prices of the commodities in the base year

	Current year: Current year is the year for which average change is to be measured or index of index number is to be calculated. **Base year:** Base year is the year of reference from which we want measure extent of change in the current year. The index number of base year is generally assumed to be 100.
Simple average of price Relatives method:	$P_{01} = \frac{\Sigma\left(\frac{P_1}{P_0}\times 100\right)}{N}$ Here, P_{01} Price index of the current year $\frac{P_1}{P_0}\times 100$ = Price relatives N = Number of commodities
Weighted average of price relative method:	$P_{01} = \frac{\Sigma RW}{\Sigma W}$ Here, P_{01} = Index number for the current year in relation to base year W = Weight, R = Price relatives i.e. $\frac{P_1}{P_0}\times 100$

Weighted Aggregative method:	(a) Laspeyre's Method $(L)\ P_{01} = \frac{\Sigma P_1 q_0}{\Sigma P_0 q_0} \times 100$ (b) Paasche's Methods $(P)\ P_{01} = \frac{\Sigma P_1 q_1}{\Sigma P_0 q_1} \times 100$ (c) Fisher's Method $P_{01} = \sqrt{\frac{\Sigma P_1 q_0}{\Sigma P_0 q_1} \times \frac{\Sigma P_1 q_1}{\Sigma P_0 q_1}} \times 100$ or $\frac{L+P}{2}$
Fisher's Method is considered as 'Ideal' because	• It is based on variable weights. • It takes into consideration the price and quantities of both the base year and current year. • It is based on Geometric Mean (GM) which is regarded as the best mean for calculating index number. • Fisher's index number satisfies both the Time Reversal Test and Factor Reversal Test.
Consumer Price Index Or Cost of Living Index Number (CPI)	The consumer price index is the index number which measures the averages change in prices paid by the specific class of consumers for goods and services consumed by them in the current year in comparison with base year. $CPI = \frac{\Sigma WR}{\Sigma W}$ $R = \frac{P_1}{P_0} \times 100$
Wholesale price index (WPI):	The Wholesale Price Index (WPI) measures the relative changes in the prices of commodities traded in the wholesale markets. In India, the wholesale price index numbers are constructed on weekly basis.

Industrial Production Index	The index number of industrial production measures changes in the level of industrial production comprising many industries. It includes the production of the public and the private sector. It is a weighted average of quantity relatives. The formula for the index is $\frac{\sum \left[\frac{q_1}{q_0} \times 100\right] W}{\sum W}$
Agricultural Production Index	Index number of agricultural production is weighted average of quantity relatives.
Sensex	Sensex is the index showing changes in the Indian stock market. It is a short form of a Bombay Stock Exchange sensitive index. It is constructed with 1978-79 as the reference year or the base year. It consists of 30 stocks of leading companies in the country.
Purpose of Constructing Index Number	• Purpose of constructing index number of prices is to know the relative change or percentage in the price level over time. A rising general price level over time is a pointer towards inflation, while a falling general price level over time is a pointer towards deflation. • Purpose of constructing index number of quantity is to know relative change or percentage change in the quantum or volume of output of different goods and services. A rising index of quantity suggests a rising level of economic activity and vice-versa.

INRODUCTION

ECONOMY : Economy is a system which provides people, the means to work and earn a living. It provides living to the people by making use of available resources to produce required goods and services through the essential processes of Production, consumption and capital formation.

DIFFERENT TYPES OF ECONOMIES:

1. **Market or capitalist economy**–-- It is a free economy in which economic activities are controlled by the market forces of demand and supply. Economic decisions are taken mainly for profits. Private sector dominates the economic activity. Consumer is sovereign.

2. **Centrally planned economy**---Economic activities are controlled by a central authority or the government. Economic decisions are taken mainly for social welfare. Public sector dominates the economic activity. Consumer is not sovereign.

3. **Mixed economy**---Economic activities are governed by the market forces of demand and supply but they are regulated by the government. Economic decisions are taken for both profits as well as social welfare. Both public and private sector function in the economy. Though consumer is sovereign but supply of essential goods is ensured to all the sections through PDS.

ECONOMICS: It is a science of human behaviour concerned with the allocation of scarce means to satisfy unlimited human wants. The consumer can maximize satisfaction while the producer can maximize profits. Society can maximize the social welfare.

SCARCITY: It refers to the situation When Supply of resources is less than the demand for resources.

CHOICE: Choice is the process of selecting from limited resources which have alternative uses.

DIFFERENCE BETWEEN MICROECONOMICS AND MACROECONOMICS:

Microeconomics	Macroeconomics
1. Studies the behaviour of individual units of an economy. For example, Individual income, individual output, etc.	1.It studies the behaviour of aggregates of the economy . For example, national income, national output, etc.
2. Demand and supply are the tools used.	2.Aggregate demand and aggregate supply are the tools used.
3. It aims to determine price of a commodity or factors of production.	3. It aims to determine income and employment level of the economy.
4. It involves limited degree of aggregation.	4. It involves a high degree of aggregation.
5. It assumes that all macro variables remain constant	5. It assumes that all micro variables remain constant.
6. It's also known as **the Price theory.**	6. It's also known as **Income and employment theory.**

POSITIVE ECONOMICS	NORMATIVE ECONOMICS
1. Deals with economic behaviour based on facts. For example Mr. A says that prices are rising in India & Mr B says that prices are under control in India.	1. Deals with opinions related to economic issues. For example, Income inequalities should be reduced OR Unemployment is not good for an economy.
2. It can be verified with actual data.	2. It cannot be verified with actual data.
3. Does not give any value judgments.	3. It gives value judgments.
4. Relates to 'what was' , 'What is' and 'what would be'?	4. Relates to what ought to be.
5. May not be necessarily statements of truth.	5. These statements cannot be termed as true or false.

ECONOMIC PROBLEM : It is essentially the problem of Choice which arises due to Unlimited human wants, Limited Resources & these limited resources having alternative uses.

CENTRAL PROBLEMS OF AN ECONOMY: Every economy faces three central problems which are related to allocation of resources:

1. **What to produce---** Economy has to decide what goods and services are to be produced since means are scarce in relation to their wants. Also, it has to be decided in what quantity are these goods and services to be produced? For example, whether consumer goods or capital goods; War time goods or peacetime goods are to be produced and in what quantity?

2. **How to produce**---This problem is concerned with the choice of Technique of production. It has to be decided whether Labour-intensive technique is to be used or Capital- intensive technique. The choice of technique also depends upon raising productivity and lowering costs.

3. **For whom to produce**---Due to limited resources, goods and services cannot be produced for all. In every section of the society if more goods are produced for poor, social justice is promoted but profits remain low for the producers. On the other hand, if more goods are produced for producers then social equality may take a back seat.
   This problem can be categorized into:
   - ✓ Personal distribution---National income is distributed among different groups of people.
   - ✓ Functional distribution---Deciding the share of different factors of production in the total national product of the economy.

CONCEPT OF PRODUCTION POSSIBILITY FRONTIER/CURVE/ PRODUCTION BOUNDARY/PRODUCTION POSSIBILITY FRONTIER/ TRANSFORMATION LINE/TRANSFORMATION CURVE.

It is a graphical presentation of different combinations of two goods which can be produced with the given resources and technology. This concept is based on the assumptions that:

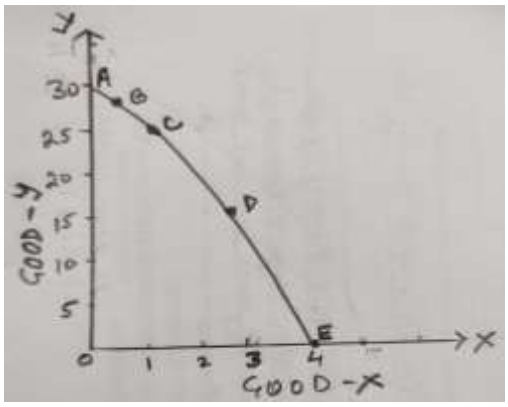
- Resources are given.
- Given a, resources are fully and efficiently utilized.
- Technology remains constant.

PRODUCTION POSSIBILITY SCHEDULE

Possibilities	Good X(Units)	Good Y(Units)
A	0	30
B	1	29
C	2	25
D	3	15
E	4	0

When all the resources are used for production of Good Y then 30 units of good Y can be produced but no unit of Good X can be produced as shown in possibility A. Similarly, when all the resources are used for producing good X, then 4 units of Good X can be produced but no units of good Y as shown in possibility E.

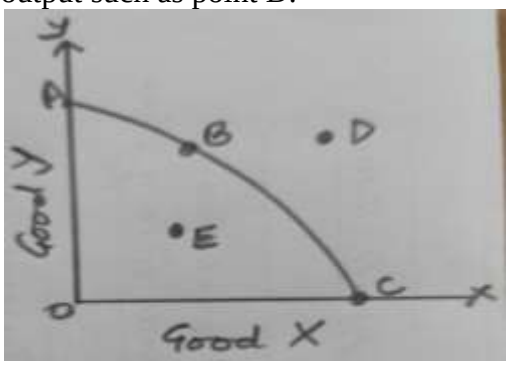
PRODUCTION POSSIBILITY CURVE: Representing the various production possibilities on the graph we get the PPC.



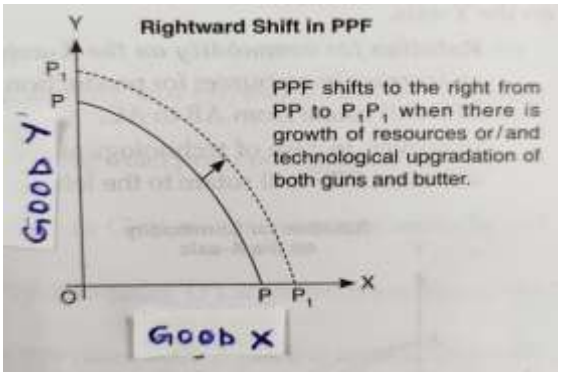
While point A shows resources & technology being used for production of Good Y only, point E shows resources & technology being used for production of Good X only. Points B, C &D show various possible combinations of X & Y being produced with the given resources & technology.

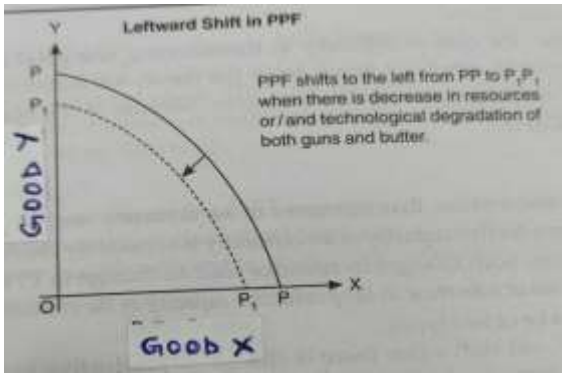
ATTAINABLE & NON-ATTAINABLE COMBINATIONS OF GOODS

All the points which either fall on the PPC curve such as points A, B & C or inside the PPF such as point E are attainable combinations of good X & Y, with given resources and technology. On the other hand, any point which falls outside the PPF shows unattainable/ non-attainable combinations of output such as point D.

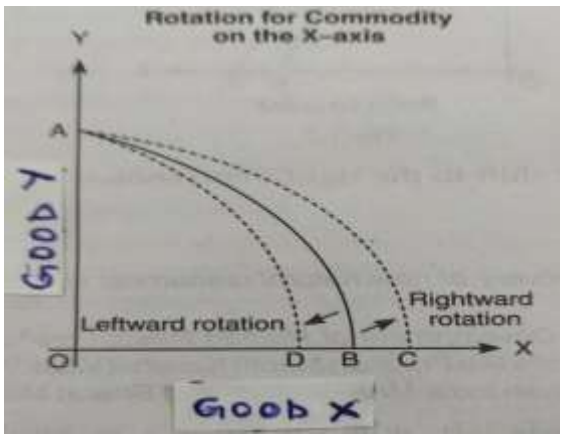


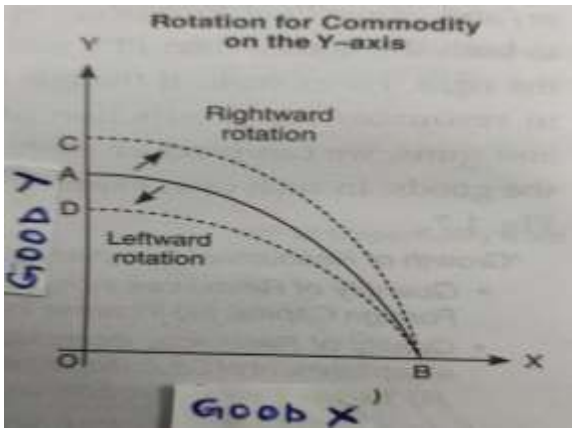
SHIFTING OF PPC: PPC shifts when it either moves to the right or to the left of the original PPC. This may happen when resources increase or decrease for both the goods X &Y or when technology becomes efficient for the production of both the goods.





ROTATION OF PPC: PPC rotates when one end of the curve is on the same point on a given axis while the other end moves either left or right on the other axis. This may happen when efficient technology is used for production of only one good.



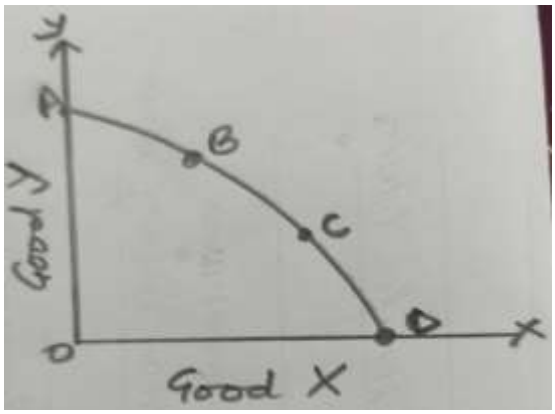


CHARACTERISTICS OF PPC:

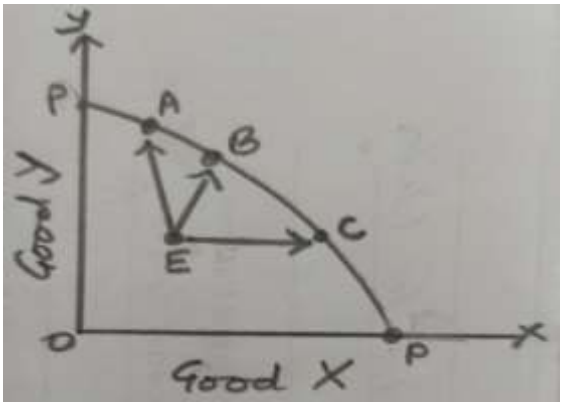
1. **PPC slopes downward----**PPC slopes downwards from left to right because, given the resources, production of both the goods cannot be increased at the same time. If more of good X is produced less of good Y will have to be produced.
2. **PPC is concave to the point of origin**-----This means, to produce every additional unit of Good X more and more units of good Y have to be sacrificed, that is, Opportunity cost of producing every additional unit of Good X tends to increase in terms of loss of production of good Y.

CENTRAL PROBLEMS EXPLAINED USING PPC:

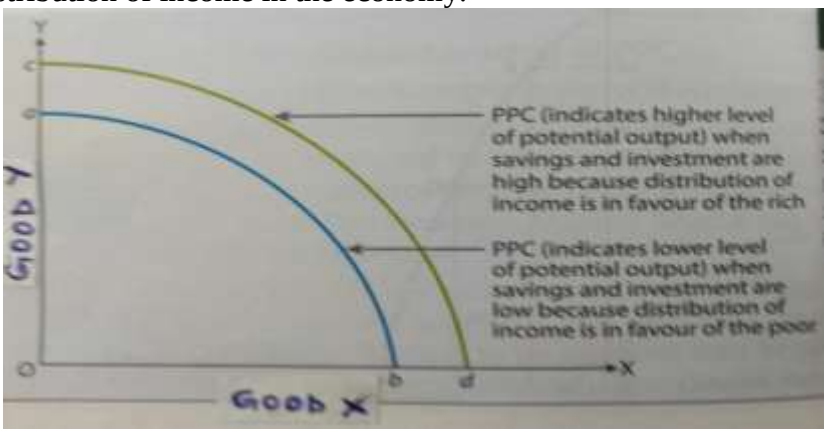
1. **What to produce**— Given the resources and technology either of the two goods X/Y can be produced if all resources are diverted towards one of them. Different combinations may be produced in which case, if more of one good is produced, we can obtain only less of the other. In the given diagram, Point A shows production of only good Y and Point D shows production only good X. Stretch between points A &D shows different possible combinations of goods X & Y(points B & C), that can be produced given the resources and technology.



2. **How to produce**---To enable optimum use of resources, economy chooses a relevant technique. Point E which is inside the PPC shows inefficient technique because if efficient technique is used there will be more production of one good without sacrificing the production of the other as shown by points A & C. Or, there will be greater production of both X & Y as shown by point B in relation to point E.



3. **For whom to produce**---Relates to the distribution of income. If an economy has more focus on Growth, in place of Equitable distribution of income, there will be greater savings & investment. PPC, then will shift from ab to cd. However, this will lead to unequal distribution of income in the economy.

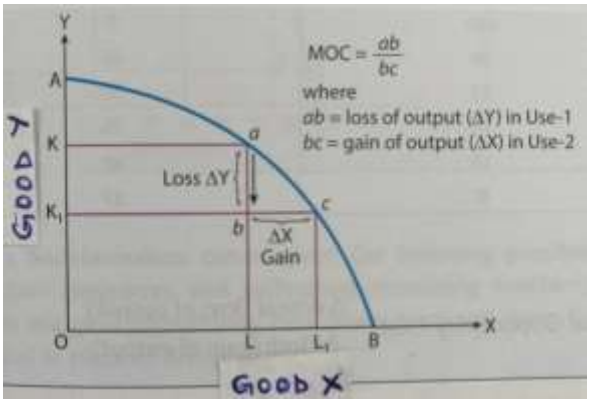


CONCEPT OF OPPORTUNITY COST: It is the total loss of output when some resources are shifted from one use to the other. It indicates the cost of all the units produced. Resources are shifted from one use to the other.

CONCEPT OF MARGINAL OPPORTUNITY COST/MARGINAL RATE OF TRANSFORMATION: It is The ratio between loss of output and gain in output when some resources are shifted from one use to the other. It indicates the cost of additional unit of output when some resources are shifted from use-1 to use-2.

PPC AND MOC/MRT: In case of Production Possibility Curve, the MOC is always increasing. This means more and more units of a good have to be sacrificed to gain an additional unit of another good. This explains the Concavity of PPC. Increasing MOC operates because productivity and efficiency of factors of production decreases as they are shifted from one use to the other.

$$\textbf{MOC} = \frac{\Delta Y \text{ (loss in output of good Y)}}{\Delta X \text{ (gain in output of good X)}}$$



MOC = $\frac{\Delta Y \text{ (loss in output of good Y)}}{\Delta X \text{ (gain in output of good X)}}$

MOC = KK_1/LL_1 = ab/ bc = SLOPE OF PPC

MOC/MRT SCHEDULE:

Possibilities.	Good X(Units)	Good Y(Units)	MOC/MRT
A	0	30	—
B	1	28	2Y:1X
C	2	24	4Y:1X
D	3	18	6Y:1X
E	4	10	8Y:1X
F	5	0	10Y:1X

CAN PPC BE A STRAIGHT LINE CURVE?

It is possible only if we assume MOC to be constant, that is, same amount of good Y is sacrificed to gain an additional unit of Good X. This is possible only when all resources are assumed to be equally efficient in production of all the goods. However, practically this situation will not arise because MOC always increases.

CAN PPC BE CONVEX TO ORIGIN?

It is possible only if MOC decreases, that is, less and less units of good Y are sacrificed to gain an additional unit of Good X. However, practically this situation will not arise because MOC always increases.

CONSUMER'S EQUIULIBRIUM AND DEMAND

KEY CONCEPTS

1) Utility
   A) Total Utlity
   B) Marginal Utility
   C) Law of Diminishing Marginal Utility
   2) Consumer's Equilibrium-Conditions of Consumer's Equilibrium (Utlity Approach)
   3) The Consumer's Budget
      a) Budget Set
      b) Budget Line
   4) Preferences of the Consumer
      a) Monotonic Preference
      b) Indifference Curve
      c) Indifference Map
   5) Conditions of Consumer's Equilibrium (Indifference Curve Approach)
   6) Demand
      a) Individual Demand
      b) Market Demand
      c) Demand Schedule
      d) Demand Curve
   7) Determinants of Demand
   8) Movement along the Demand Curve
      A) Extension
      B) Contraction
   9) Shift in the Demand Curve
      A) Increase in Demand
      B) Decrease in Demand
   10) Price Elasticity of Demand
   11) Measurement of Price Elasticity of Demand
      Proportionate Method or Percentage Method
   12) Factors Affecting Price Elasticity of Demand

Consumer : A Consumer is a person who makes some purchases to fulfill his wants.

Utility: The want satisfy quality of a commodity is called utility.

TOTAL UTILITY:- It is the sum total of utility derived from the consumption of all the units of a commodity. Sum of MU

MARGINAL UTILITY:- It refers to an additional utility made to total utility on account of the consumption of an additional unit of a commodity.

Relationship between TU & MU :

When MU diminishes, TU tends to increase at a diminishing rate.

When MU is zero, TU is maximum

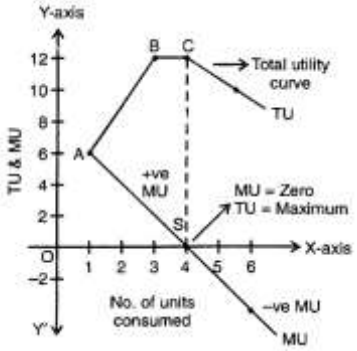
When MU is negative, TU start diminishing.

Difference between Cardinal Utility and Ordinal utility:-

Cardinal Utility	Ordinal utility
The satisfaction that consumer derives from consumption of goods and services are measured in utils	The satisfaction that consumer derives from consumption of goods and services are not measured but ranked
Introduced by Alfread Marshall Analysis	Introduced by J R Hicks Analysis
It is Quantitative method	It is Ranking system or Qualitative method

Law of Diminishing Marginal Utility

According to Law of Diminishing Marginal Utility, As we consume more and more of goods, the marginal utility goes on diminishing.



Conditions of Consumer's Equilibrium :

A) Single Commodity

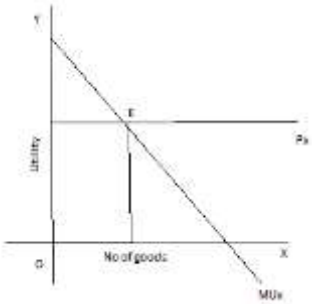
Mu x = P x

B) Two Commodity :

MU x = MU y

CONSUMERS EQUILIBRIUM :-

It means allocation of income by a consumer on goods and services in a such manner that gives him maximum satisfaction. It is a situation when a consumer gets maximum satisfaction with limited income and has no tendency to change his way of existing expenditure to change his consumption pattern is known as Consumer's equilibrium.



Equilibrium :

Equilibrium means state of balance.

Conditions :- Mux is equal to price Px

Table:

No of commodity	MU_m	MU_m / P_x
1	7	18/2=9
2	7	16/2=8
3	7	14/2=7
4	7	12/2=6
5	7	10/2=5

Schedule : Showing price of a good and marginal utility derived from consumption of commodity X due to operation of Law of DMU. Price (Px) is a horizontal and straight price line as price is fixed at Rs. 2 per unit. From the given schedule and diagram, it is clearly states that the consumer will be equilibrium at point ;E' when he consumes 3 units of commodity X, because at point E only Mux / Px=.MU_m

He will not consume 4th unit of commodity of X as MU_m sacrifice amount is 7 > utility gained 6. Similarly , he will not stop consumption of 2 units of X commodity as MU_m sacrifice amount is 7 < utility gained 8. A consumer will continue to purchase the commodity as long as MU>Price. But according to LDMU, MU falls as more is consumed. . At some point price and MU equals that is consumer equilibrium.

Consumer's equilibrium means allocation of income by a consumer on goods and services in a manner that gives him maximum satisfaction.

The two conditions of Consumer's equilibrium are :-

(i) Ratio of marginal utility to price in case of each good is the same i.e. MU_x / P_x ; MU_y / P_y or $\mathbf{MU_x = P_x}$

(ii) MU of a good decreases as more of it is consumed (or)

A consumer will attain equilibrium if he allocates his given income on purchase of goods X and Y in a manner that gives him maximum satisfaction. He will get maximum satisfaction if he buys only that quantity of each good that gives him same utility from the last rupee spent on each good. In other words, **M.U.x / Px must be equal to M.U.y / Py**

If M.U.x / Px is not equal to M.U.y / Py then the consumer is not in equilibrium. If M.U.x / Px > M.U.y / Py then rupee M.U.x > M.U.y . He will buy more Of X and less of Y.

This will reduce M.U.x and increase M.U.y. These changes will continue till M.U.x / Px equal to M.U.y / Py and he will be in equilibrium.

Units	MU of X	MU of Y	The consumer will spend the first rupee on commodity 'X' which will provide him utility of 20 utils. And the second rupee will be spent on commodity 'Y' to get 16 utils. To reach equilibrium, consumer should purchase that combination of both the goods, when i) MU of last rupee spend on each commodity is same and ii) MU falls as consumption increases.. It happen when consumer buys 3 units of 'X' and 2 units of "Y". and the total satisfaction of 74 utils will be obtained by doing so. Other combination getting lesser satisfaction than it.
1	20	16	
2	14	**12**	
3	**12**	8	
4	7	5	
5	5	3	

Consumer Equilibrium through indifference curve:

Monotonic preference : Among two bundles ,a rational consumer prefer that bundle which has more of at least one of the goods and no less of other good as compared to any other bundle.

Budget Set: Set of bundles available to consumer.

Budget Line: It shows all combinations of two goods that a consumer can purchase and the cost of which is exactly equal to his money income.

Equation of Budget line: $P1X1+P2X2=M$

Indifference Curve:

A curve various combinations of two goods which gives consumer same level of satisfaction

Properties of IC:

1. It slopes downwards from left to right.
2. It is always convex to the origin due to decreasing Marginal Rate of Substitution (MRS).
3. Higher IC always IC always gives higher satisfaction
4. Two ICs never intersects each other.

Indifference Map:

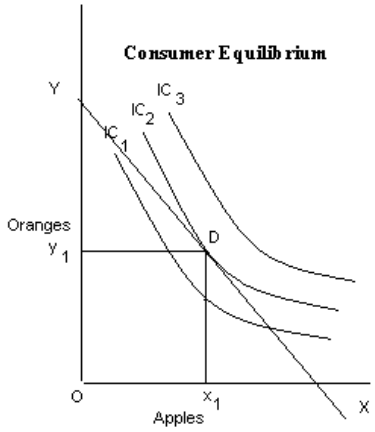
Group of indifference curves that gives different levels of satisfaction to the consumer.

Marginal rate of Substitution (MRS):

It is the rate at which a consumer is willing to give up one good to get one more unit of another good.

Consumer Equilibrium:-

At a point where budget line is tangent/ touches the higher indifference curves.
MRS = P_X / P_Y , i.e., Ratio of prices of two goods.



DEMAND

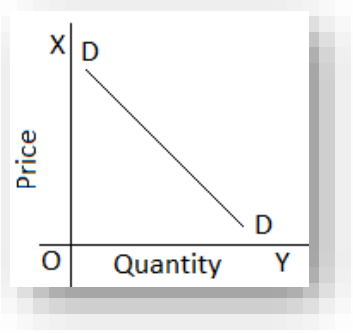
DEMAND:- Demand refers to the quantities of a commodity that the consumers are able and willing to buy at each possible price of a commodity during a given period of time

Other thing remains same, when price increases , demand for a commodity decreases and vice versa,. Hence there is a inverse relation between price and demand.

Schedule : It shows quantity of demand at different price of a good

Price	Demand
1	100
2	80
3	60
4	40
5	20

c) Demand curve :- It is graphical representation of DD schedule. The 'DD' curve slopes downward from left to right.



DETERMINANTS OF DEMAND

(Dx = f(Px,Pr,Y,P,T)

a. Price of a commodity: With the fall in the price of a commodity, its demand increase and vice versa.

b. **Price of other related goods**: Demand for a commodity is also influenced by the change in the price of other related goods.

(i) **Substitute goods**: Increase in the price of one causes increase in demand for the other and decrease in the price of one causes decrease in demand for the other. For e.g., tea and coffee,

(ii) **Complementary goods**: A fall in price of one causes increase in the demand of the other and a rise in the price of one causes decrease in the demand for the other. For e.g Price of petrol and demand for car.

c. **Income of the consumer**: Change in the income of the consumer also influences his demand for different goods. The demand for normal goods tends to increase with increase in income, and vice-versa. On the other hand, the demand for inferior goods like coarse grain tends to decrease with increase in income and vice-versa.

d**. Population**:- There is a direct relation between population and demand for a good.

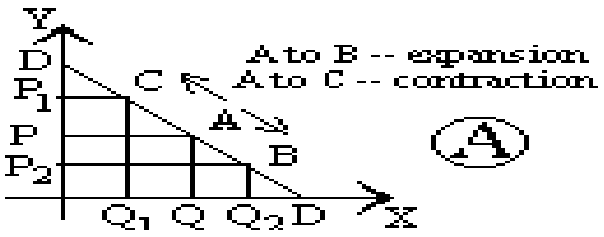
Individual demand:-Quantity demanded of a commodity by a buyer at a given price during a given period is called individual demand.

e. **Tastes** – If the consumer develops favorable taste for the good its demand increases

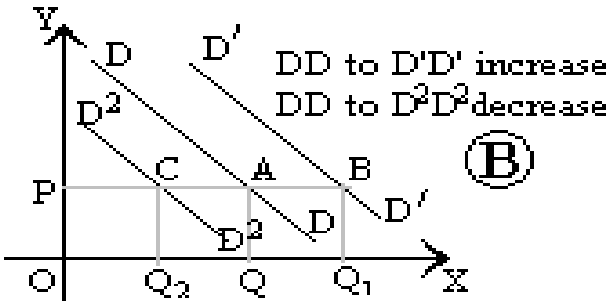
Market demand:- Quantity demanded of a commodity by all the buyers is called market demand

Change in Quantity demand (Movement) vs Change/Shift in demand:

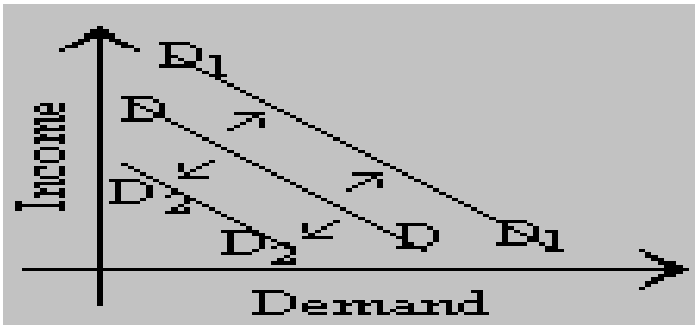
Change in Quantity: The change in the price of commodity leads, there will be change in quantity of demand for the commodity .Expansion due to fall in price, and Contraction due to rise in price. (diagram – A)



Change/Shift in demand: A change or shift of demand curve is due to a change the other factors(Income of the consumer iii) Price of related goods and iv) Tastes and preferences of the individual/ consumer) than price of the commodity. Rightward shift of 'DD'curve means increase quantity, while leftward shift 'DD'curve means decrease quantity.

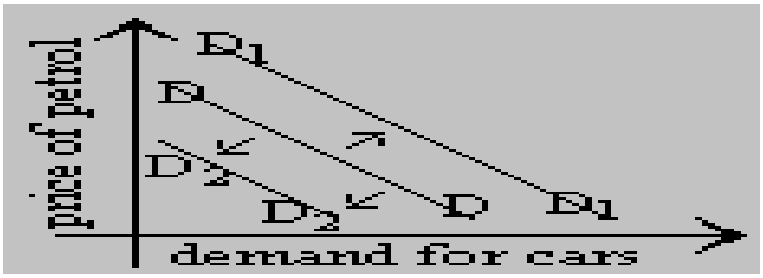


INCOME EFFECT/ GOODS:-Generally as income of a consumer increases, the consumer may buy more or less of a product. If he/she buys more product means it is a **Normal good**, its demand curve shifts right wards and less product means it is **Inferior goods** its demand curve shits left wards.



RELATED GOODS: (Both Substitute goods and Complementary goods)

Substitute goods are those goods, which can be used in place of each other. E.g. coffee and tea, and gur and sugar. An increase in the price of a substitute good (Coffee) causes an increase in the demand for the commodity (Tea) Its demand curve shifts to rightward and vice versa



Complementary goods are those goods, which jointly satisfy a given want. E.g. car and petrol; pen and ink. etc., In case of complementary goods , the demand for a commodity rises with the fall in the price of other commodities. Cars and petrol are Complementary goods. If the price of the petrol falls , the demand for car will rise and vice versa.

Causes of Increase in Demand;-

1. Increase in Income
2. Increase in taste and preference
3. Rise in substitute good's price

Causes of Decrease in Demand:

1. Decrease in Income
2. Decrease in taste and preference
3. Decrease in substitute good's price

Why is the demand Curve Downward Sloping ?

(i**) Law of diminishing marginal utility**, If we go on consuming more and more units of a good , the additional benefit that a person derives from the additional benefits that the additional unit goes on falling. Therefore the consumer buys more of a good at lower price.

ii**) Income effect :-** If the price of the product falls the real income of the consumer increases, so consumer will buy more. And if price of a commodity increases the real income (purchasing power) of consumer decreases therefore quantity demanded for that commodity also decreases.

iii) **Substitution effect** : If the price of the product falls it becomes cheaper in comparison to its substitutes so the consumer will buy more. If price of a commodity increases the substitute of the commodity becomes dearer and quantity demanded for that commodity decreases.

iv) **Uses of commodity** : If a commodity has diverse uses, with the fall in the price of product consumer will buy more. For e.g. milk can be used for drinking, making tea, coffee, curd, butter, sweets, ghee etc.,

ELASTICITY OF DEMAND

Price Elasticity of Demand (Ed):

It refers to the degree of responsiveness of quantity demanded to change in its price.

Ed. = Percentage change in quantity demanded/ Percentage change in price

Ed. = P/q X Δq/Δp

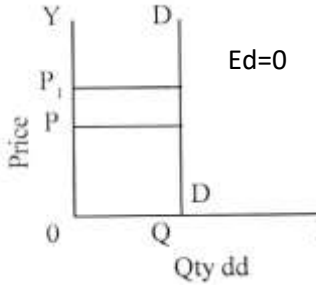
P = Original price

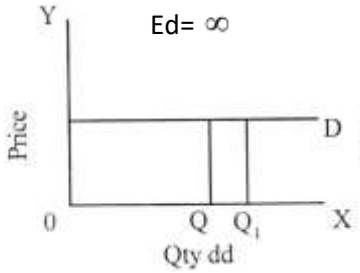
Q = Original quantity

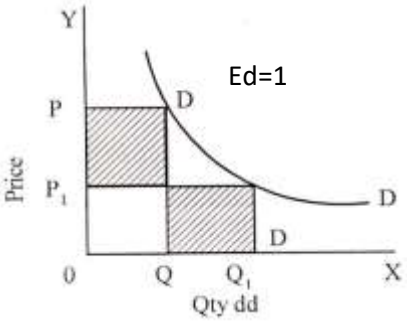
Δ = Change

Types of Elasticity of Demand :

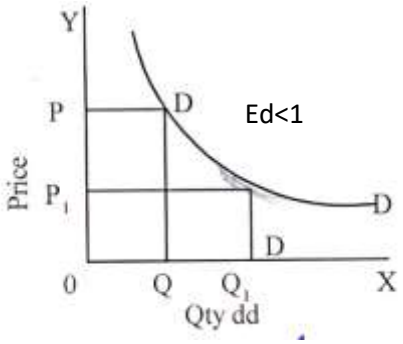
1. **Perfectly inelastic demand: -** Even with the changes in price, there is no change in the quantity demanded, the demand is said to be perfectly inelastic **Ed = O.** The demand curve is parallel to 0X axis
2. **Perfectly elastic demand: -** Even with small change in price there is a great change in qty. Demanded, then the demand is said to be perfectly elastic. The demand curve is parallel to ox axis

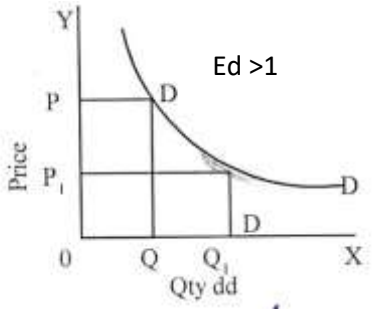






3. **Unitary Elastic Demand**: With a unit increase are decrease in price, there is unit increase or decrease in qty. dd, the demand is said to be unitary elastic. The demand curve is rectangular hyperbola.
4. **Relatively less elastic:** With a unit increase in price, the quantity demanded is proportionately less, then demand is said to be less elastic
5. **Relatively more elastic**: With a unit increase in the price, there is proportionately more increase in the qty. Demanded, the demand is said to be more elastic.





Methods of Measuring Price Elasticity of Demand:-

Total Expenditure	Proportionate Method	Geometric Method

A. Percentage method:-

The demand for a good moves in the opposite direction of its price. But the impact of the price change is always not the same. Sometimes, the demand for a good changes considerably even for small price changes. Price-elasticity of demand for a good.

Ed= percentage change in demand for the good
percentage change in the price of the good

Proportionate / Percentage Method:

$$E_d = \frac{\%\text{ change in Quantity demanded}}{\%\text{ change in price}}$$

or

$$= \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Q. The Price of ice cream is Rs.20 per cup and demand is for 200 cup. If the price of ice cream falls to Rs.15 demand increases to 300 cups. Calculate elasticity of demand.

$P = 20$; $P_1 = 15$; $\Delta P = 5$

$Q = 200$; $Q_1 = 300$; $\Delta Q = 100$

$$= \frac{100}{5} \times \frac{20}{200} = 2$$

B. Total Outlay Method (Expenditure Method)

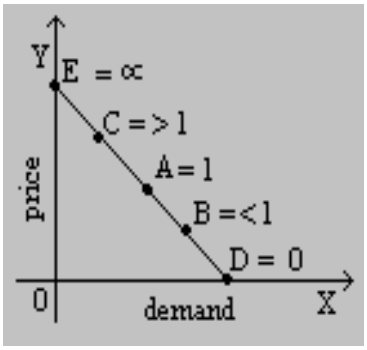
If with the fall in price, total outlay increases elasticity of demand is greater than one, if total outlay remain constant, elasticity is equal to one and if the total outlay decreases elasticity is less than one.

Situa-tion	Price of Commodity (Rs)	Quantity (Kg)	Total Expenditure (Rs)	Effect on Total Expenditures	Elasticity of Demand
A	2 1	4 8	8 8	Same Total Expenditure	Unitary Elastic $E_d=1$
B	2 1	4 10	8 10	Total Expenditure increases	Greater than unitary $E_d > 1$
C	2 1	3 4	6 4	Total Expenditure decreases	Less than unitary $E_d < 1$

C. Geometric / Point Method: -

This measures the elasticity of demand at different points on the same demand Curve.

E_d = lower segment of the demand curve
Upper segment of the demand curve



Factors Affecting Elasticity of Demand

1) **Availability of substitute goods** -Demand of a commodity will be highly elastic if it has many substitutes. And low /less elasticity if it has less substitutes

2) **Nature of commodity** -Demand of necessary and essential goods are always inelastic because consumers are restricted to buy those goods, where as luxuries are having less elastic.

3) **Different uses of the commodity**: If the commodity has different uses, its demand will be elastic and if it is a few or less uses the commodity has less elastic.

4) Taste & preferences -If the consumer is bound to use particular brand of a commodity then its demand will be inelastic because consumer will buy that particular commodity even at higher price.

5) **Level of Income** -If consumer belongs to richer section then his demand will not be affected by change in price, hence demand will be inelastic. In the case of middle section it is inelastic.

6) **Time period**:- Long period it is elastic otherwise inelastic.

7) **Habit :-** The habitual goods do not have elastic as they are bound to be purchased.

Multiple Choice Questions :

1. Total utility is maximum when:
i. MU is increasing
ii. MU is decreasing
iii. MU is zero
iv. MU is negative

2. ------refers to additional utility derived from consumption of an additional unit of a commodity.
i. Marginal utility
ii. Total utility
iii. Initial utility
iv. Satisfaction

3. When utility is expressed in_____, it is called ordinal utility.

i. Utils
ii. Rupees
iii. Ranks
iv. Total Utility

4. If consumption of an additional unit of a commodity causes no change in TU, then MU is:

i. positive
ii. negative
iii. Constant
iv. Zero

5. An indifference curve is:

i. straight line passing through origin
ii. convex to the origin
iii. concave to the origin
iv. none of these

6. As we consume more and more units of a commodity, utility derived from successive units

i. Deceases
ii. Increases
iii. remains constant
iv. none of these .

7. Which of the following is the condition of consumer's equilibrium in case of a single commodity?

i. $\frac{\text{MU of Product}}{\text{MU of a rupee (money)}} = \text{Price of Product}$

ii. $\frac{\text{Price of Product}}{\text{MU of Product}} = \text{MU of money}$

iii. $\frac{\text{MU of money}}{\text{Price of product}} = \text{MU of Product}$

iv. None of these

8. The consumer attains equilibrium at a point where budget line

i. is tangent to an indifference curve
ii. intersects the indifference curve
iii. is above the indifference curve
iv. is below the indifference curve

9. Demand for a commodity refers to

i. price of the commodity
ii. quantity of the commodity
iii. given period of time
iv. quantity and price of commodity in given period of time

10. The demand curve is usually
i. downward sloping
ii. horizontal parallel to x-axis
iii. upward sloping
iv. vertical parallel to y-axis

11. It is called 'change in quantity demanded' when
i. change (rise or fall) in demand for a good is caused by change in its own price
ii. change in demand is caused by change in income
iii. change in demand is caused by change in price of substitute good
iv. change in demand is caused by change in price of complementary good

12. The law of demand states, the relationship between quantity demanded of a good and its price.
i. positive
ii. inverse
iii. Proportional
iv. none of these

13. When the demand curve of a product shifts leftward, it indicates a situation of
i. contraction in demand
ii. decrease in demand
iii. increase in demand
iv. expansion in demand

14. With decrease in price of petrol, demand curve of cars will make
i. leftward shift
ii. rightward shift
iii. upward movement
iv. downward movement

15. When close substitute of a good are available, e_D of the good will be
i. equal to one
ii. greater than one
iii. less than one
iv. infinite

16. If an increase in price of a good X leads to rise in demand for good y, then
i. good x is a complement of good y
ii. good x is a substitute of good y
iii. neither (i) nor (ii)
iv. both (i) and (ii)

17. Price elasticity of demand (e) at mid-point of a straight line demand curve is
i. $e_D=1$
ii. $e_D=0$
iii. $e_D<1$
iv. $e_D > 1$

18. A fall in price of a good from 10 to 8 increases demand from 80 units to 100 units, Ed by total expenditure method is
i. Inelastic
ii. unitary elastic
iii. perfectly elastic
iv. elastic

19. A good is called normal if fall in income of the consumer causes in demand of the good.
i. Decrease
ii. increase
iii. no change
iv. more than proportionate change

20. Which of the following is a determinant of market demand?
i. Distribution of income
ii. Tastes and preference of consumers
iii. Price of related goods
iv. All of these

21. Consuming two goods, a consumer attains equilibrium when:
i. $\frac{MU}{P_2} > \frac{MU_2}{P_2}$
ii. $\frac{MU_1}{P_1} = \frac{MU_2}{P_2}$
iii. $\frac{MU_1}{P_1} < \frac{MU_2}{P_2}$
iv. $\frac{TU_1}{P_1} = \frac{MU_2}{P_2}$

22. The shape of MU curve is:
i. upward sloping concave to the origin
ii. downward sloping
iii. concave to the origin
iv. straight line

23. MRS is determined by:
i. satisfaction level of the consumer
ii. income of the consumer
iii. preferences of the consumer
iv. taste of the consumer

24. A set of indifference curves drawn in a graph is called:
i. indifference curve
ii. budget set
iii. budget line
iv. indifference map

25. Substitution effect takes place when price of a commodity becomes.
i. relatively cheaper
ii. relatively dearer
iii. Stable
iv. both (i) and (i)

26. If MRS is increasing throughout, the indifference curve will be:
i. Downward sloping convex
ii. Downward sloping concave
iii. Downward sloping straight line
iv. Upward sloping convex

27. When income of a consumer falls, the impact on price-demand curve of an inferior good is
i. Shifts to the right.
ii. Shifts to the left.
iii. There is upward movement along the curve.
iv. There is downward movement along the curve.

28. If Marginal Rate of Substitution is constant throughout, the Indifference curve will be
i. Parallel to the x-axis
ii. Downward sloping concave
iii. Downward sloping convex
iv. Downward sloping straight line
29. If due to fall in price of good x, demand for good Y rises, the two goods are
i. Substitutes
ii. Complements
iii. Not related
iv. Competitive
30. If MRS is increasing throughout, the indifference curve will be
i. Downward sloping convex
ii. Downward sloping concave
iii. Downward sloping straight line
iv. Upward sloping convex.
31. There is inverse relationship between price and demand for the product of a firm under
i. Monopoly only
ii. Monopolistic competition only
iii. Both under monopoly and monopolistic competition
iv. Perfect competition only
32. Demand curve of a firm is perfectly elastic under
i. Perfect competition
ii. Monopoly
iii. Monopolistic competition
iv. Oligopoly

ANSWERS

1.iii	2.i	3.iii	4.iv	5.iii	6.i	7.i	8.i	9.iv	10.i	11.i	12.ii	13.ii	14.ii	15.ii	16.ii	17.i	18.ii	19.i
20 iv	21.ii	22.ii	23.iii	24.iv	25.i	26.iii	27.i	28.iv	29.ii	30.ii	31.iii	32.i						

Assertion-Reasoning Type MCQs

A statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A)

(c) Assertion (A) is true but Reason (R) is false

(d) Assertion (A) is false but Reason (R) is true

1) Assertion (A): Total utility increases at a decreasing rate, when marginal utility falls but remains positive.

Reason (R): Total utility is the sum of marginal utility.

2) Assertion (A): Price demand curve is negatively sloped.
Reason (R): Law of demand states inverse relation between price and demand, keeping other factors constant.

3) Assertion (A): Budget line is also known as consumption possibility curve.
Reason (R): Budget line is a negatively sloped straight line.

4) Assertion (A): A consumer attains equilibrium at a point where the budget line is tangent to indifference curve.
Reason (R): At the point of tangency indifference curve is convex to origin.

5) Assertion (A): Change in quantity demanded of one commodity due to a change in price of other commodity is cross demand.
Reason (R): Changes in consumer income leads to a change in demand.

6) Assertion (A): Complementary goods have joint demand.
Reason (R): Complementary goods are demanded simultaneously to satisfy a particular want.

7) Assertion (A): An indifference curve is always convex to the origin.
Reason (R): MRS is always diminishing because of law of diminishing marginal utility.

8) Assertion (A): Marginal utility can never be zero.
Reason (R): TU is maximum when MU is zero.

9) Assertion (A): Degree of price elasticity is less than one in case of inelastic demand.
Reason (R): Proportionate change in demand is less than proportionate change in price.

10) Assertion (A): In ordinal utility analysis, equilibrium strikes where
$MRS > \frac{P_x}{P_y}$
Reason (R): A consumer reaches his optimum choice when IC is convex to the origin.

Answers :

1) a) 2) a) 3) b) 4) a) 5) b) 6) a) 7) a) 8) d) 9) a) 10) d)

Read the given case carefully and answer the following questions on the basis of the same.

1) The word demand, desire and want are often used interchangeably to express what an individual needs and what he would like to acquire. However, in economics, the term demand has a specific meaning and content. Demand is different from mere desire in economics. The demand is with reference to a particular price as well as to a given period of time. Demand of a commodity can be affected from number of factors but in economics, we study the relation between two variables assuming other factors as constant. Demand function is a relationship between the quantity demanded of a commodity and the variables that determine it.

(a) The word demand and effective desire have economics.

(i) different

(ii) close

(iii) **same**

(iv) None of these

(b) Which of the following is not an element of effective desire?

(i) Ability to purchase

(ii) Wish to purchase

(iii) Availability of good

(iv) **None of these**

(c) Which of the following factors is not a factor that affects the demand?

(i) Price of a good

(ii) **Price of factor input**

(iii) Price of related goods

(iv) None of these

(d) Which of the following leads to rightward shift in demand curve?

(i) Decrease in price of given good

(ii) **Increase in price of substitute goods**

(iii) Increase in price of complementary goods

(iv) All of these

2) Read the given case carefully and answer the following questions on the basis of the same.

Utility means wants satisfying power of a commodity. Even a harmful commodity has utility since it satisfy human wants. Utility is different for the same commodity at different places, different time and for different individuals. The concept of utility was given by Prof. Marshal. It is also helpful in finding optimum level of satisfaction of a consumer.

1) According to Marshal, Utility is

(i) **Cardinal**

(ii) Ordinal

(iii) Both (i) and (ii)

(iv) Neither (i) nor (ii)

2) If Total Utility from consuming 5 units is 20 whereas Total Utility from consuming 6 units is 22, what will be the Marginal Utility of 6th unit?

(i**) 2**

(ii) 42

(iii) (-)2

(v) None of these

3) When Total Utility is constant Marginal Utility is:

(i) **zero**

(ii) constant

(iii) minimum

(iv) Both (i) and (iii)

4) Who gave the concept of utility in economics?

(1) **Prof. Alfred Marshal**

(ii) Prof. Adam Marshal

(iii) Prof. Paul Marshal

(iv) Prof. Robbins

Read the given case carefully and answer the following questions on the basis of the same.

Marginal Utility theory and derivation of demand curve through marginal utility theory was criticised for its assumptions. So, many economists tried to find a new theory without these assumptions. Ultimately JR Hicks and RG(D) Allen presented a scientific treatment to the consumer theory on the basis of ordinal utility, graphically represented by indifference curves.

An indifference curve shows a set of different combinations of quantities of two goods that yield same satisfaction to the consumer. This theory was based upon the assumption of rationality, ordinality, consistency and transitivity of choices.

1) Ordinal utility can be:

(i) measured

(ii) **ranked**

(iii) Both (i) and (ii)

(iv) None of these

2) A curve that shows various combinations of two goods giving same level of satisfaction to the consumer is

(i) **Indifference Curve**

(ii) Production Possibility Curve

(iii) Both (i) and (ii)

(iv) Budget Line

3) Which of the following is not a property of indifference curve?

(i) It is negatively sloped.

(ii) **Two indifference curves can interest each other**.

(iii) Higher the indifference curve, higher the level of satisfaction

(iv) None of these

4) Which of the following is not a condition for a consumer to be in equilibrium with indifference curve analysis?

(i) Indifference curve must be tangent to budget line

(ii) Indifference curve must intersect budget line

(iii) Indifference curve must be concave to origin

(iv) **Both (ii) and (iii)**

FREQUENTLY ASKED QUESTIONS – CBSE BOARD EXAMINATIONS

1. Define Microeconomics
2. Why an economic problem does arise?
3. What are the central problems of an economy?
4. Define opportunity cost.
5. Distinguish between Normative and Positive economics.

6. Define marginal opportunity cost.
7. Distinguish between 'micro' and' macro' economics.
8. Why PPC is Concave from the origin.
9. Define Marginal Rate of Transformation (MRT)
10. Explain the problem, of 'what to produce' and ' how to produce'
11. What is an indifference curve?
12. Define Utility.
13. What is budget set?
14. Define budget line.
15. Define MRS.
16. A consumer consumes only two goods. Explain the conditions of consumer's equilibrium with the help of IC analysis.
17. For a consumer to be in equilibrium, why must MRS be equal to the ratio of price of two goods?
18. What is an indifference map?
19. Explain the law of demand with the help of diagram and schedule.
20. Write three causes of increase / decrease in demand
21. Distinguish between the change in quantity demand and change in demand.
22. Explain any three factors or determinants of demand.
23. Explain any three factors affecting elasticity of demand
24. Explain the price elasticity of demand through geometric method.
25. Explain the price elasticity of demand through expenditure method

PRODUCER BEHAVIOUR AND SUPPLY

Production: Combining inputs in order to get the output is production.

Production Function: It is the functional relationship between inputs and output in the given state of technology.

Q= f(L , K)

Q is the output, L:Labour, K: Capital

Fixed factor: the factor whose quantity remains fixed with the level of output.

Variable factor: those inputs which change with the level of output.

Capital	Labour	Output
10	1	50
10	2	70
10	3	82
10	4	92
10	5	100

Here units of capital used remain the same for all levels of output. Hence it is a fixed factor.

Amount of labour increases as output increases. Hence it is a variable factor.

PRODUCTION FUNCTION AND TIME PERIOD

1.Production function is a long period production function if all the inputs are varied.

2. Production function is a short period function if few variable factors are combined with few fixed factors.

CONCEPTS:

Time period, can be classified as:

1. Very short period or market period

2. Short period / short run

3. Long period / long run

Market period: is that period where supply / output cannot be altered or changed.

Short period/ run: is the period that supply/output can be altered /changed by changing only variable factors of production. In other words fixed factors of production remain fixed.

Long period :is that period where all factors of production are changed to bring about changes in output/ supply. No factor is fixed.

Difference between short run and long run:

Basis	**Short run**	**Long run**
Meaning	Only variable factors are changed	All factors are changed
Price determination	Demand is active	Both demand and supply play an important role
Classification	Factors are classified as fixed and variable.	All factors are variable.

CONCEPT OF PRODUCT: Refers to volume of goods produced by a firm or an industry during a specific period of time.

TOTAL PRODUCT: Total quantity of goods produced by a firm /industry during a given period of time with given number of inputs.

.Average product =output per unit of variable input.

.APP= TPP/ units of variable factor.

.Average product is also known as average physical product.

MARGINAL PRODUCT(MP): refers to addition to the total product, when one more unit of variable factor is employed.

MPn=TPn - TPn-1

MPn=Marginal product of n'th Unit of variable factor.

TPn=Total product of n units of variable factor.

TPn-1=Total product of (n-1)Unit of variable factor.

n= number of units of variable factor.

MP= ΔTP/ Δn

We derive TP by summing up MP.

TP= $\sum$MP.

LAW OF VARIABLE PROPORTION OR RETURNS TO A VARIABLE FACTOR:

Statement of law of variable proportion: In Short period, when only one variable factor is increased ,keeping other factors constant ,the total product (TP) initially increases at an increasing rate, then increases at a decreasing rate and finally TP decreases.

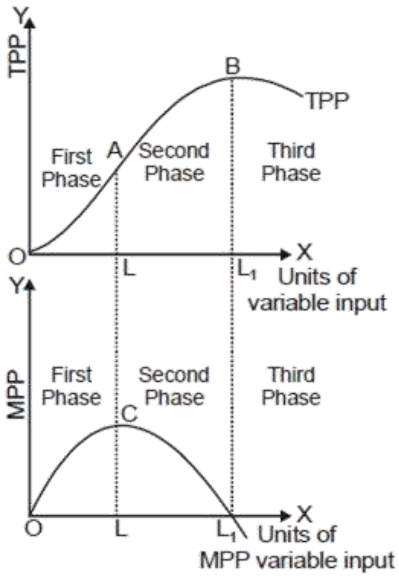
MPP Initially increases then Falls but remains positive then 3rd phase becomes negative.

Explanation of law of variable proportion with a schedule and a diagram.

Schedule of law of variable proportion

Fixed factor	Variable factor	Total product	Marginal product	Phase
Land In acres	Labour	units	Units	
1	0	0	-	I-Increasing returns to a factor
1	1	5	5	
1	2	15	10	
1	3	30	15	
1	4	40	10	II- Diminishing returns to a factor
1	5	45	5	
1	6	45	0	
1	7	40	-5	III- Negative returns to a factor

Diagram:



Phase I / Stage I / Increasing returns to a factor.

I. TPP Increases at an increasing rate.

II.MPP Also increases.

Phase II / Stage II/ Diminishing returns to a factor.

I. TPP increases at decreasing rate

II. MPP decreases/ Falls

III. This phase ends when MPP is zero and TPP is maximum.

Phase III / Stage III / Negative returns to a factor

I. TPP diminishes / decreases

II. MPP becomes negative.

Reasons for increasing returns to a factor.

I. Better utilisation of fixed factors.

II. Increase in efficiency of variable factor.

III. Optimum combination of factor.

Reasons for diminishing returns to a factor

I.Indivisibility of factor.

II. Imperfect substitutes.

Reason for negative returns to a factor

I.Limitation of fixed factors.

II.Poor coordination between variable and fixed factors.

III.Decrease in efficiency of variable factors.

Relation between MPP and TPP

I.As long as MPP increases, TPP increase at an increasing rate.

II.When MPP decreases, TPP increases diminishing rate.

III.When MPP is Zero , TPP is maximum.

IV.When MPP is negative , TPP starts decreasing.

SHORT ANSWERS QUESTIONS AND LONG ANSWER QUESTIONS

1. What is meant by production?

Ans. Transformation of Input into Output.

2. What will be MP when TP is maximum?

Ans. MP will be zero.

3. Define market period, Short run and Long run?

Ans. Refer time period.

HOTS

Giving reasons, state whether the following statements are true or false:

1)When there are diminishing returns to a factor, total product always decreases.

Ans. False, when there is diminishing returns to a factor, TPP increases at a decreasing rate.

2)TPP increases only when MPP increases.

Ans. False. TPP also increases when MPP decreases but remains positive.

3)Increase in TPP always indicates that there are increase in returns to a factor.

Ans. False. TPP increases even when there are diminishing returns to a factor

4)When there are diminishing returns to a factor marginal and total products always fall

Ans. False. Only MPP falses , not TPP. In case of diminishing returns to a factor, TPP increases at diminishing rate.

5)Calculate MP for the following

Variable factor unit	0	1	2	3	4	5	6
TP (unit)	0	5	13	23	28	28	24

Ans: MP: 0 5 8 10 5 0 -4

COST

Cost of production: Expenditure incurred on various inputs to produce goods and services.

Cost function: Functional relationship between cost and output.

C=f(q)

Where,

f=functional relationship

c=cost of production.

q= quantity of product.

Money cost: Money expenses incurred by a firm for producing a commodity or service.

Explicit Cost: Actual payment made on hired factors of production. For example wages paid to the hired labourers, rent paid for hired accommodation, cost of raw material etc.

Implicit Cost: Cost incurred on the self-owned factors of production.

For example, interest on owners capital, Rent of own building, Salary for the services of entrepreneur etc.

Opportunity cost: is the cost of next best alternative foregone/sacrificed.

Fixed Cost: are the cost which are incurred on the fixed factors of production.

These cost remain fixed whatever may be the scale of output. These cost are present even when the output is zero.

These costs are present in short run but disappeared in long run.

Numerical example of fixed cost

Output	0	1	2	3	4
5TFC Rs	20	20	20	20	20

TFC= Total fixed cost

Diagrammatic presentation of TFC

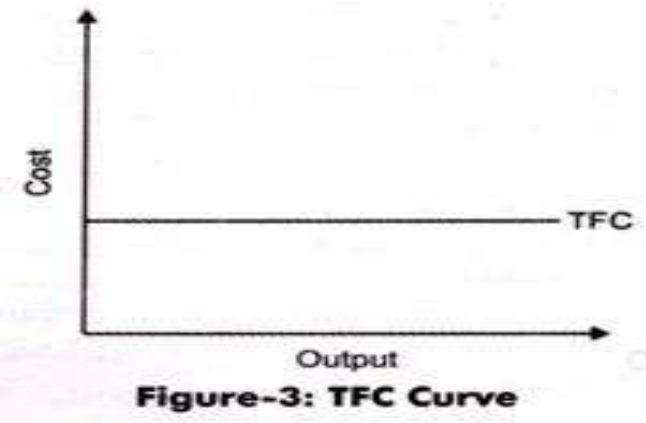


Figure-3: TFC Curve

TFC is also called “overhead cost” , “supplementary cost” , and “unavoidable cost”.

Total Variable Cost: TVC or variable cost - are those cost which vary directly with the variations in the output. These costs are incurred on the variable factors of production.

These costs are also called “prime costs”, “Direct cost” or “avoidable cost”.

These costs are zero when output is zero.

Numerical example,

Output	0	1	2	3	4	5
TVC	0	10	16	25	38	55

Diagrammatic presentation of TVC

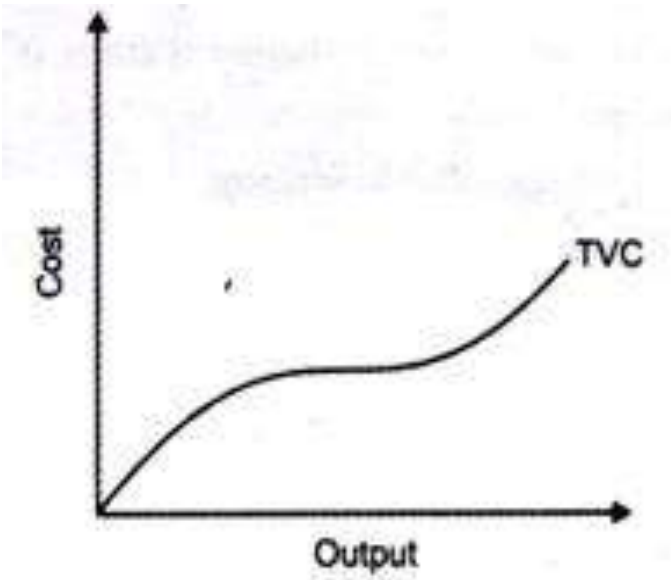


Figure-4: TVC Curve

Difference between TVC and TFC

Basis	**TVC**	**TFC**
Meaning	Vary with the level of output	Do not vary with the level of output
Time period	Can be change in short period	Remain fixed in short period
Cost at zero output	Zero	Can never be zero
Factors of production	Cost incurred on all variable factors	Cost incurred on fixed factors of production
Shape of the cost curve	Upward sloping	Parallel to x-axis

Total Cost: is the total expenditure incurred on the factors and non-factor inputs in the production of goods and services.

It is obtained by summing TFC and TVC at various levels of output.

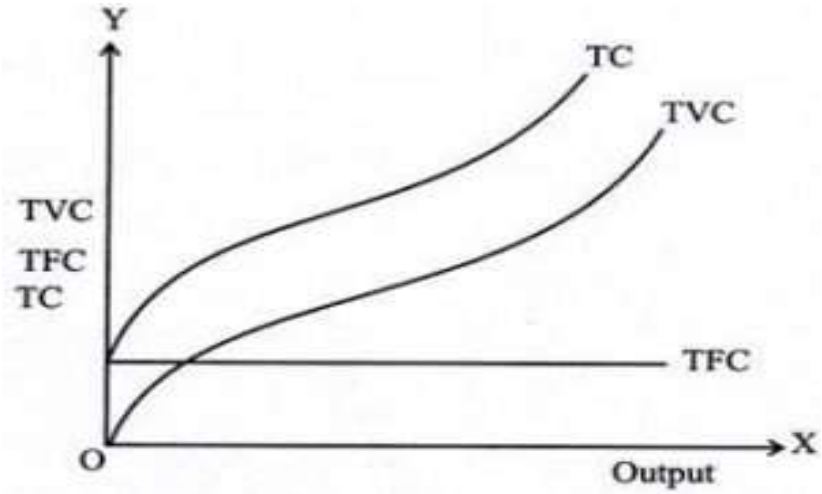
Relation Between TC,TFC and TVC

1.TFC is horizontal to x-axis

2.Tc and TVC are S shaped (they rise initially at a decreasing rate, then at a constant rate and finally at an increasing rate) due to law of variable proportions.

3.At zero level of output TC is equal to TFC.

4.TC and TVC curves parallel to each other.



.TC=TFC+TVC

.TFC=TC-TVC

.TVC=TC-TFC

Average Cost: are the "cost per unit" of output produced.

Average Fixed Cost: is the per unit fixed cost of production.

AFC= TFC/Q or output

AFC declines with every increase in output. It's a rectangular hyperbola. It goes very close to x-axis but never touches the x-axis as TFC can never be zero.

Average variable cost: is the cost per unit of the variable cost of production.

AVC = TVC / output.

AVC falls with every increase in output initially. Once the optimum level of output is reached AVC starts raising.

Average total cost (ATC) or Average cost (AC) :refers to the per unit total cost of production.

ATC = TC / Output

AC = AFC + AVC

Phases of AC

I phase : When both AFC and AVC fall, AC also fall

II phase : When AFC continue to fall, AVC remaining constant AC falls till it reaches minimum.

III phase : AC rises when rise in AVC is more than fall in AVC.

IMPORTANT OBSERVATIONS OF AC, AVC & AFC

1.AC curve always lie above AVC (because AC includes AVC & AFC at all levels of output).

2.AVC reaches its minimum point at an output level lower than that of AC because when AVC is at its minimum AC is still falling because of fall in AFC.

3.As output increases, the gap between AC and AVC curves decreases but they never intersect.

Marginal cost: refers to the addition made to total cost when an additional unit of output is produced.

MCn = TCn - TCn-1

MC = $\Delta TC/\Delta Q$

Note: MC is not affected by TFC.

RELATIONSHIP BETWEEN AC AND MC

.Both AC & MC are derived from TC

.Both AC & MC are "U" shaped (Law of variable proportion)

.When AC is falling MC also falls & lies below AC curve.

.When AC is rising MC also rises & lies above AC

.MC cuts AC at its minimum where MC= AC

Important formulae at a glance

1.TFC = TC - TVC or TFC = AFC x output or TFC = TC at 0 output.

2.TVC = TC - TFC or TVC = AVC x output or TVC = $\sum$MC

3.TC = TVC + TFC or TC = AC x output or TC = $\sum$MC + TFC

4.MCn =TCn - TCn-1 or MCn = TVCn - TVCn-1

5.AFC = TFC / Output or AFC =AC-AVC or ATC - AVC

6.AVC = TVC/ Output or AVC = AC - AFC

7.AC = TC / Output or AC = AVC + AFC

Short answers and Long answer questions:

1.What is cost of production?

2.Define cost of function.

3.What are money costs?

4.Distinguish between explicit and implicit costs.

5.How do you define an opportunity cost?

6.What difference you find between fixed and variable costs?

7.Why the fixed cost curve is a horizontal straight line to the X axis?

8.Why variable costs are variable?

9.What is average cost? How do you derive it?

10.Explain AVC, AFC & ATC and explain the relationship between these costs.

11.Explain the relationship TC, TFC & TVC.

12.With a diagram describe the various phases of AC.

13.Bring out the relationship between AC & MC

HOTS

1.Why AFC curve never touches 'x' axis though it lies very close to x axis ?

Ans:- Because TFC can never be zero.

2.Why AVC and AFC always lie below AC?

Ans:- AC is the summation of AVC & AFC so AC always lies above AVC & AFC.

3.Why TVC curve start from origin?

Ans:- TVC is zero at zero level of output.

4.When TVC is zero at zero level of output, what happens to TFC or Why TFC is not zero at zero level of output?

Ans:- Fixed cost are to be incurred even at zero level of output.

REVENUE

Revenue :- Money received by a firm from the sale of a given output in the market.

Total Revenue: Total sale receipts or receipts from the sale of given output.

TR = Quantity sold x price (or) output sold x price

Average Revenue: Revenue or receipt received per unit of output sold.

AR = TR/Output sold

AR and price are the same.

TR = Quantity sold x price or output sold x price

AR = (output / quantity x price) / Output / quantity

AR = price

AR and demand curve are the same. Shows the various quantities demanded at various prices.

Marginal Revenue : Additional revenue earned buy the seller by selling an additional unit of output.

$MR_n = TR_n - TR_{n-1}$

$MR_n = \Delta TR_n / \Delta Q$

$TR = \sum MR$

Relationship between AR and MR (when price remains constant or perfect competition)

Under perfect competition, the sellers are price takers. Single price prevails in the market. Since all the goods are homogeneous and are sold at the same price AR = MR. As a result AR and MR curve will be horizontal straight line parallel to OX axis. (When price is constant or perfect competition)

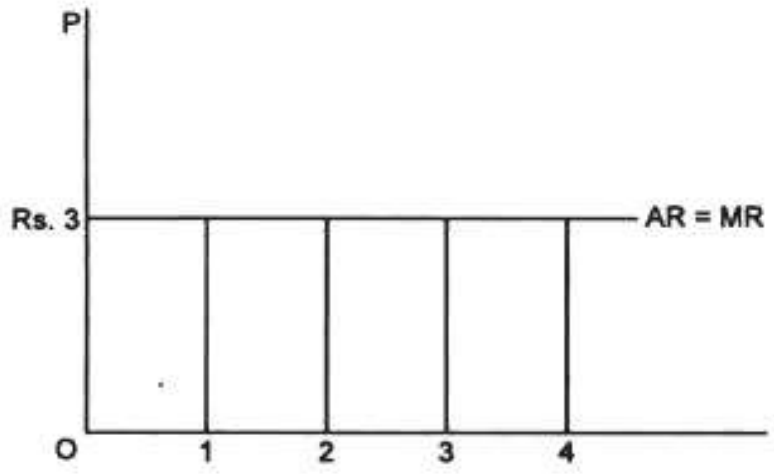


Fig. 7 : Horizontal AR curve & MR curve

Relation between TR and MR (When price remains constant or in perfect competition)

When there exists single price, the seller can sell any quantity at that price, the total revenue increases at a constant rate (MR is horizontal to X axis)

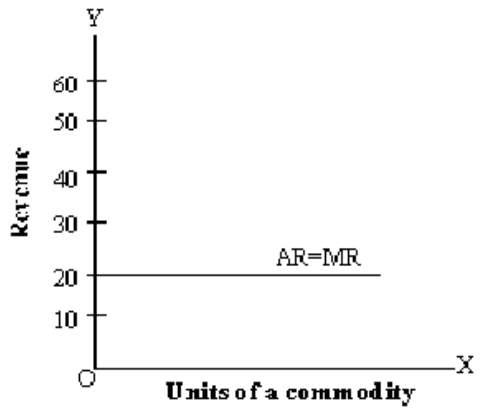
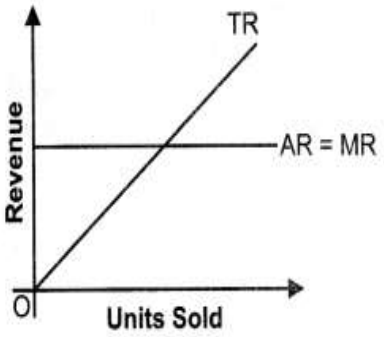


Fig. 4.12



Relationships between AR and MR under monopoly and monopolistic competition (Price changes or under imperfect competition)

.AR and MR curves will be downward sloping in both the market forms.

.AR lies above MR.

.AR can never be negative.

.AR curve is less elastic in monopoly market form because of no substitutes.

.AR curve is more elastic in monopolistic market because of the presence of substitutes.

Relationship between TR and MR .(When price falls with the increase in sale of output)

.Under imperfect market AR will be downward sloping – which shows that more units can be sold only at a less price.

.MR falls with every fall in AR / price and lies below AR curve.

.TR increases as long as MR is positive.

.TR falls when MR is negative.

.TR will be maximum when MR is zero.

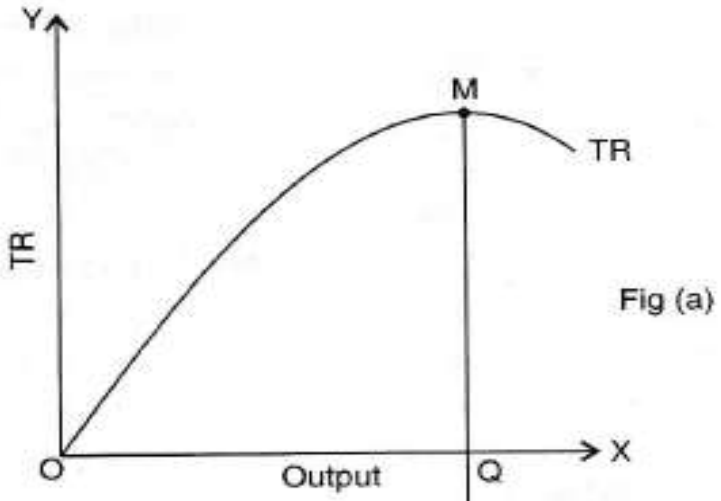


Fig (a)

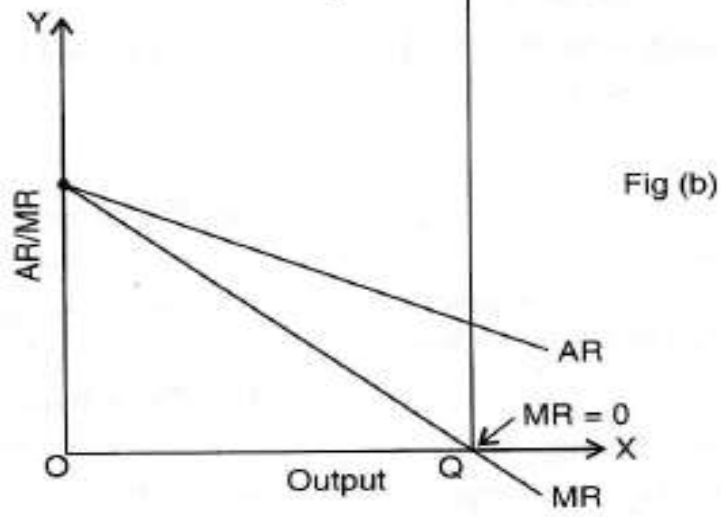


Fig (b)

FORMULAE AT A GLANCE:

TR=Price or AR x output sold or TR=∑MR

AR(price)=TR÷units sold

MRn=MRn-MRn-1

HOTS

1. Can MR be negative or zero?

Ans. Yes,MR can be zero or negative.

2.If all units are sold at same price how will it affect AR and MR?

Ans. AR and MR will be equal at levels of output.

3.What is price line?

Ans. Price line is the same as AR line and is horizontal to X-axis in perfect competition.

4.Can TR be a horizontal Straight line?

Ans. Yes, when MR is zero.

5.What do you mean by revenue?

6.Explain the concept of revenue(TR,AR and MR).

7.Define AR.

8.Prove that AR = price.

9.Prove that AR is nothing but demand curve.

10.Explain the relationships between AR and MR when price is constant and when price falls.

11.Explain the relationships between TR and MR when price is constant.

12.What is break-even point? Explain with a diagram.

13.When the situation of 'shut-down' point arises for a firm?

14.What happens to TR when

a)MR is increasing ,

b)Decreasing but remains positive and

c)MR is negative?

Ans. a) TR increases at an increasing rate.

b) TR increases at diminishing rate.

c) TR decreases

15. Why AR is more elastic in monopolistic competition than monopoly?

Ans. Monopolistic competition market has close substitutes. Monopoly market does not have close substitutes.

16. Why TR is 45 degree angle in perfect competition market?

Ans. In perfect competition market the goods are sold at the same price so AR = MR and the TR increases at a constant rate.

17. Can there be break-even point with AR = AC.

Ans. Yes there can be breakeven point with AR=AC.

CONCEPT OF SUPPLY

1.Individual supply refers to quantity of a commodity that an individual firm is willing and able to offer for sale at each possible price during a given period of time.

2.Market supply: It refers to quantity of a commodity that all the firms are willing and able to offer for sale at each possible price during a given period of time.

3.The supply curve of a firm shows the quantity of commodity (Plotted on the X-axis)that the firm chooses to produce corresponding to two different prices in the market (Plotted on the Y-axis)

4.Supply schedule refers to a table which shows various quantity of a commodity that a producer is willing to sell at different prices during a given period of time.

5.Determinants of supply are a) state of technology b) inpuyt prices c) Government taxation policy.

6.Law of supply: It states direct relationship between price and quantity supplied keeping other factors constant.

7.Movement along the supply curve: It occurs when quantity supplied changes due to change in its price, keeping other factors constant.

8.Shift in supply curve: It occurs when supply changes due to factor other than price.

9.Reasons for shift in supply curves: Change in price of other goods, change in price of factors of production, change in state of technology, change in taxation policy.

10.Expansion in supply: It occurs when quantity supplied rises due to increase in price keeping other factors constant.

11.Contraction of supply: It means fall in the quantity supplied due to fall in price keeping other factors constant .

12.Increase in supply refers to rise in the supply of a commodity due to favourable changes in other factors at the same price.

13.Decrease in supply: It refers to fall in the supply of a commodity due to unfavourable change in other factors at the same price.

14.Price elasticity of supply: The price elasticity of supply of a good measures the responsiveness of quantity supplied to changes in the price of a good.

15.Price elasticity of supply = % change in quantity supplied / % change in price.

16.Geometric method:

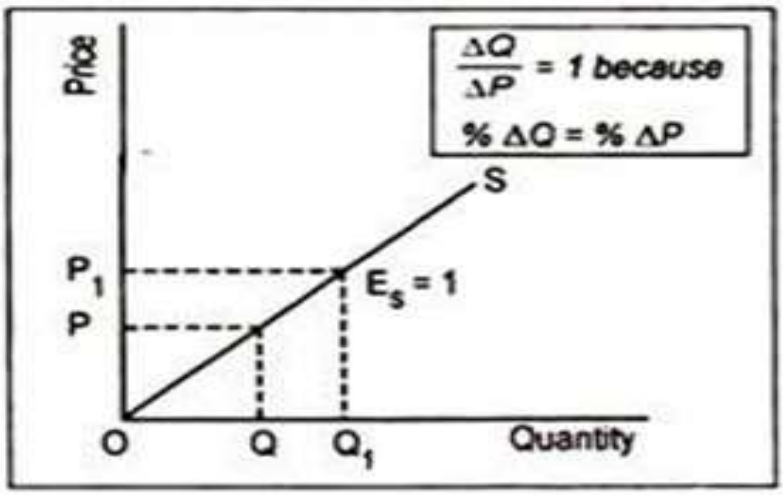


Fig. 4.19: $E_S = 1$

Es at a point on the supply curve = Horizontal segment of the supply curve / Quantity supplied

Fig.1:BC/OC>1 Fig.2:BC/OC=1 Fig.3: BC/OC<1

FREQUENTLY ASKED QUESTIONS – CBSE BOARD EXAMINATION

One Mark Questions (1M)

1.Define the law of supply.

2.Define market supply.

3.What do you understand by supply curve of a firm?

4.What do you mean by elasticity of supply?

5.Define supply schedule.

6.Define revenue of a firm? OR give meaning of revenue ?

7.Define Marginal Revenue?

8.What is Average revenue?

9.When will the marginal revenue become negative?

10.What happens to total revenue when Marginal revenue is zero?

11.In which market the Average revenue is equal to marginal Revenue?

THREE MARKS QUESTIONS (3M)

1.Give reasons for the rightward shift in supply curve?

2.Give reasons for the leftward shift in supply curve?

3.If the price of the commodity falls by 10% and consequently the quantity supply decreases by 20% what will be elasticity of supply?

FOUR MARKS QUESTIONS (4M)

1.Briefly explain the geometric method of measuring price elasticity of supply?

2.Distinguish between change in supply and change in quantity supplied ?

3.Explain the movement along the supply curve?

THREE OR FOUR MARKS QUESTIONS (3M/4M)

1.What changes will take place in marginal Revenue when:

a)TR increases at an increasing rate ?

b)TR increases at a diminishing rate?

2. Complete the following table:

Units	1	2	3	4	5	6
Total Revenue	20	-	-	56	-	-
Average Revenue	-	18	-	-	-	-
Marginal Revenue	-	-	12	-	4	0

SIX MARKS QUESTIONS (6M)

1.Explain the determinants of supply?

2.Explain the relationship between Total Revenue and marginal Revenue using a Schedule and diagram?

PRODUCER'S EQUILIBRIUM: MC=MR APPROACH

INTRODUCTION: Producer's equilibrium refers to the level of output of a commodity which gives the maximum profit to the producer of that commodity. Profit equals total revenue less total cost. Therefore, the output level at which 'total revenue less total cost' is maximum is called the equilibrium output level.

MC=MR approach:

MC=MR approach is the way of identifying producer's equilibrium. The two conditions of MC=MR approach are:

i) MC=MR

ii) MC is greater than MR after the MC=MR output level.

Let us explain these conditions.

1) MC=MR

When one more unit of output is produced, MR is the benefit in terms of more revenue and MC is the cost to the producer. Clearly, so long as benefit is greater than the cost, or MR is greater than MC, it is profitable to produce more. Therefore, so long as MR is greater than MC, the maximum profit level, or the equilibrium levels is not reached. The equilibrium is not achieved because it is possible to add to profits by producing more.

The producer is also not in equilibrium when MR is less than MC because benefit is less than the cost. By producing less the producer can add to his profits.

When MC is equal to MR, the benefit is equal to cost, the producer is in equilibrium subject to that MC becomes greater than MR beyond this level of output. When MC equals MR (Subject to the supporting condition) the producer's profit would be less if he produces output more than or less than the 'MC=MR' output as explained above. Therefore, for equilibrium to reach it is a necessary condition (but not sufficient) that MC equals MR.

2) MC is greater than MR after MC=MR output level

MC=MR is a necessary condition but not sufficient enough to ensure Equilibrium. It is because the producer may face more than one MC=MR Outputs. But out of this only that output beyond which MC becomes greater than MR Is the equilibrium output. It is because if MC is greater than MR, producing beyond MC = MR out will reduce profits. And when it is no longer possible to add to profits the maximum profit level is reached. on the other hand, if MC is less than MR beyond the MC= MR Output, it is possible to add to profits by producing more. Therefore this MC=MR level is not the equilibrium level.

NOTE: For a producer to be in equilibrium it is necessary that MC equals MR as well MC becomes greater than MR if more output is produced.

Illustrations and graphic presentation.

Illustration 1.

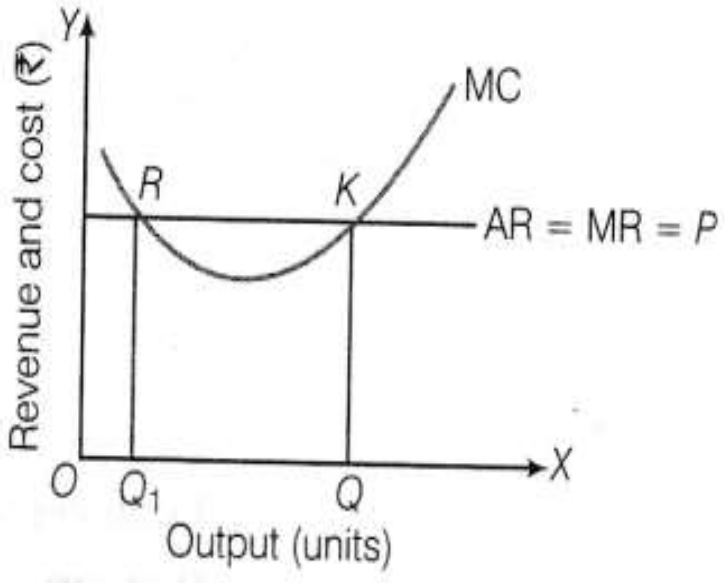
The following illustration relates to the market which allows the producer to sell any quantity he can at the prevailing market price.

Price (Rs.perunit)	output (units)	TR (Rs.)	TC (Rs.)	MR (Rs.)	MC (Rs.)	Profits
8	1	8	8	8	8	0
8	2	16	15	8	7	1
8	3	24	20	8	5	4
8	4	32	28	8	8	4
8	5	40	38	8	10	2

Note that in the above illustration MC = MR condition is satisfied both the output level 2 units and the output level 4 units. But the second condition - MC becomes greater than MR- is satisfied only at 4 unit of output there for equilibrium output level is 4 units.

Graphics presentation.

When a producer is free to sell any quantity at a given price, the MR curve is perfectly elastic and is parallel to the x-axis. A typical MC curve is U- shape curve.



Graphically, the two conditions of equilibrium become;

1. MC curve intersects MR curve.

2. MC curve intersects MR curve from below.

Note that the first condition (MC =MR) is satisfied both at A and B. But the second condition- MC Curve intersects MR from below-is satisfied only at B. After B, MC becomes greater than MR. Then the equilibrium output level is OQ2.

Illustration 2:

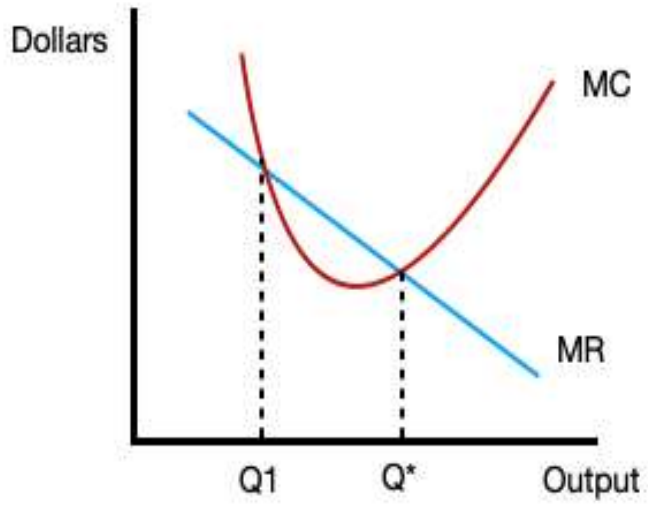
This illustration relates to the market in which a producer can sell more only by lowering the price.

Price (Rs.perunit)	output (units)	TR (Rs.)	TC (Rs.)	MR (Rs.)	MC (Rs.)	Profits
8	1	8	5	8	5	3
7	2	14	8	6	3	6
6	3	18	12	4	4	6
5	4	20	17	2	5	3
4	5	20	23	0	6	-3

In this illustration the two condition of equilibrium are satisfied at 3 units of output. MC equals MR and MC is greater than MR when more output is produced. The producer is in equilibrium when he produces 3 units of output.

Graphic presentation:

When a producer can sell more only by lowering the price, the MR curve is downward sloping. The typical MC curve is U-shaped.



Note that MC equal to Mr condition is satisfied at both A and B. But the second condition-MC is greater than MR or MC curve cuts MR from below-is satisfied only at B. So, the equilibrium level of output is OQ2.

UNIT 7: FORMS OF MARKET & PRICE DETERMINATION UNDER PERFECT COMPETITION WITH SIMPLE APPLICATIONS

MARKET: - It refers to the entire region where buyers and sellers of a good are in contact with each other for the purpose of sale and purchase of the commodity. Market is not related to any particular place. Buyers and sellers need not necessarily be in touch through their physical presence only.

BASIS FOR CLASSIFYING MARKET STRUCTURE: Market structure refers to the number and type of firms operating in the industry. The following factors determine the market structure:

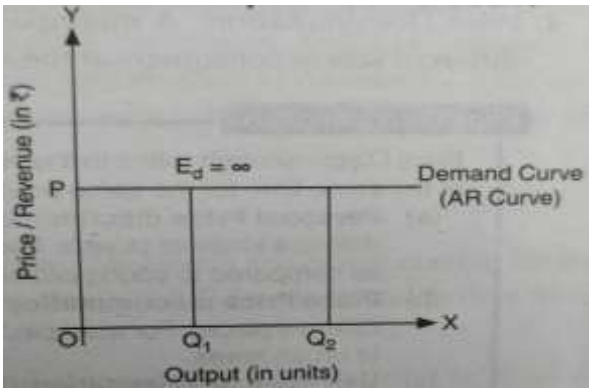
1. **Number of buyers and sellers**: --Larger the number of buyers and sellers lesser is their influence on the price of the goods and services & vice versa.
2. **Nature of the commodity**: ---A homogeneous commodity can be sold at a uniform price but a differentiated commodity may be sold at different prices.
3. **Freedom of movement of firms**: ----When there is freedom of movement for entering and exiting the market, the prices will be stable. However greater the restrictions on entry and exit then, Prices can be influenced.
4. **Knowledge of market conditions**: ---Perfect knowledge about the market conditions among buyers and sellers can help to keep prices uniform. But imperfect knowledge leads to different prices being charged.
5. **Mobility of goods and goods and factors of production**: ---If factors of production can move freely, a uniform price can prevail. But in case of immobility, different prices may prevail in the market.

PERFECT COMPETITION----FEATURES:

- **Very large number of buyers and sellers:** This will imply that the share of each seller is insignificant in the total supply & the share of each buyer is insignificant in the total purchase. Hence, individual buyers or sellers cannot influence the market price. The price of a good, therefore, will be determined by the market forces of demand and supply. Hence a single producer or a consumer will be a price taker.
- **Homogeneous product:** The product in the market is identical in all respects. Hence, no buyer has a specific preference to buy from a particular seller only. This implies that the buyers are willing to pay only the same price for the commodity to all the firms in the industry. This would mean that no individual seller is in a position to charge a higher price for its product. Thus, uniform price prevails in the market.
- **Freedom of entry and exit in the market to the seller:** There are no barriers to the entry of new firms into the industry. This implies that when existing firms are earning abnormal profits, it will attract new firms to enter the industry. The market supply will rise causing the market price to fall. As a result, the Profits will also fall. The entry of new firms will continue, till each firm is earning just the normal profit. When the firms face loss, they are free to exit the market. As firms start leaving the market, the overall supply reduces. This causes the market price to rise. Consequently, there is reduction in losses. The firms continue to leave till losses are erased & each existing firm earns just the normal profit.

- **Perfect knowledge among buyers and sellers**: The consumers and the producers are fully informed about the market price. This implies that no firm is in a position to charge a different price and no consumer will pay a higher price, and hence a uniform price prevails.

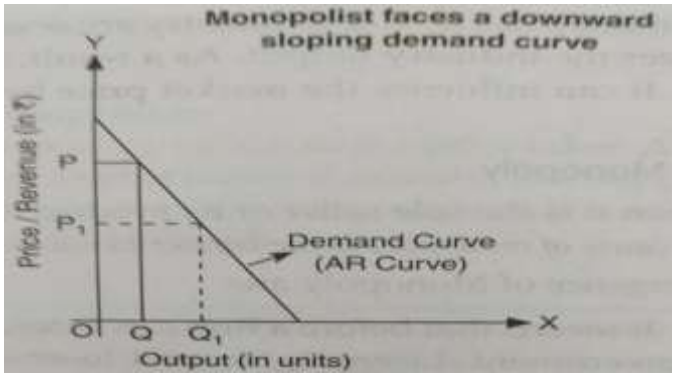
- **Perfect mobility of factors of production**: Land, labour capital, and entrepreneur do not have any geographical or occupational restriction on their movement. They are free to move to the industry in which they get the best price.
- **Absence of selling cost**: Selling cost is the cost of advertisement to promote the sales of the product. Due to perfect knowledge amongst buyers and sellers, there are no selling costs in perfect competition.
- **Absence of transportation cost**: This assumption is made in order to ensure uniform price in the market, and hence, transportation costs are assumed to be zero.
- **Shape of the Demand Curve:** Since each firm is a Price- taker, that is, a very large number of buyers and sellers sell a homogeneous product at a uniform price, hence, the demand curve in perfect competition is perfectly elastic.



MONOPOLY ----FEATURES:

- **Single seller:** There is a single seller. selling the product in this market. Hence, the monopolist has full control over the supply and price of the product. Therefore, the monopolist becomes a price maker. He can fix his own price and influence the market price by changing the supply of the product. However, since there are large number of buyers, no single buyer can influence the price.
- **No close substitutes:** The monopoly firm does not fear competition because there is only one product in the market which does not have any close substitutes.
- **Restrictions on entry and exit:** There are strong barriers to the entry of new firms and existing firms. This implies that a monopoly firm can earn abnormal profits and losses in the long run. The barriers may be due to licensing or patent rights or due to the formation of cartels.
- **Price discrimination:** It is a practice of charging different prices from different buyers at the same time for the same product. A monopolist is in a position to do so.
- **Shape of the Demand Curve:** The single seller constitutes the entire market. However, demand of the product is not in the control of monopoly firm. If a monopolist wants to increase his sales, he will have to reduce the prices. Hence, a monopoly firm faces a downward sloping demand curve. This demand curve is **less elastic** because percentage change in quantity demanded is less than percentage change in prices since the consumer has no choice as there is only a single commodity available in the market.

($E_d < 1$)



EMERGENCE OF MONOPOLY:

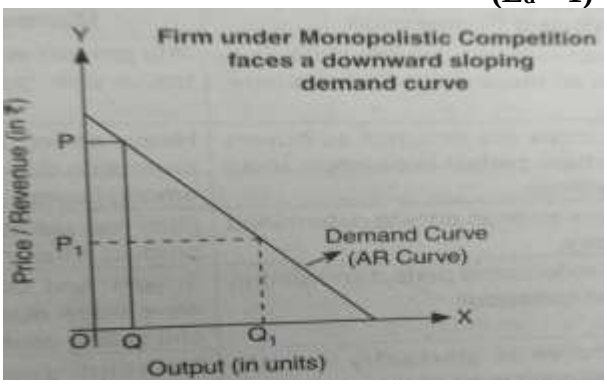
1. **Government licenses:** In case government grants a license to a single producer only for the production of a particular commodity then Monopoly comes into existence.
2. **Patent rights:** They are the official recognition of the innovators of a new product or technology. No one can copy their product without obtaining a license. This gives rise to monopoly market structure. Patent rights are granted mainly to encourage research and development as well as discoveries and innovations for a number of years known as Patent life. This gives rise to Monopoly structure.
3. **Cartels:** It is the collective decision making by a group of firms to avoid competition and secure monopoly control of the market. They reach a broad agreement on the pricing and output policy making it a joint monopoly structure.
4. **Natural occurrence:** If nature provides a particular good to a particular person or producer, full control over its price and output can be exercised.

MONOPOLISTIC COMPETITION----FEATURES:

- **Large number of sellers:** This market has large number of sellers who are selling closely related products, though they are not homogeneous. This implies that each firm has a limited share of the market. Presence of large number of firms leads to competition.
- **Product differentiation:** It refers to differentiating the products on the basis of size, colour, shape, brand, etc. For example, different brands of soaps, shampoos, toothpastes, etc. Since the products are close substitutes, a single firm is in a position to enjoy some degree of Monopoly.
- **Selling costs:** The expenses incurred on sales, promotion and marketing of the product are a very important feature of monopolistic competition. Due to close substitutes being sold, every producer tries to gain greater share of the market through selling costs.
- **Freedom of entry and exit:** Firms are free to enter into or exit from the industry at any time this means new firms can enter when abnormal profits are being earned. It will cause market supply to increase & hence, prices to fall, till each firm earns only normal profits. If losses are being incurred in the market, the existing firms are free to leave. This would reduce the market supply and raise the price of the good till losses are wiped out. Thus, in the long run only Normal profits will exist.
- **Lack of perfect knowledge:** Selling costs create artificial superiority about a particular product in the minds of the consumers. Hence, neither buyers nor sellers have perfect knowledge about the market conditions.
- **Pricing decision:** A firm in this market has partial control over the price. The degree of power to control price depends upon the extent to which brand loyalty is followed by the consumers.

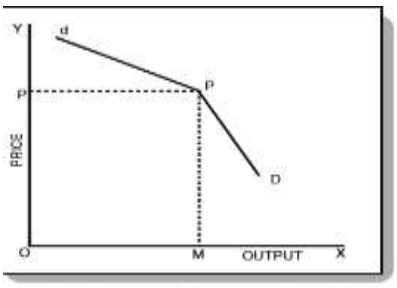
- **Non price competition:** It refers to competing with its rival firms by way of offering free gifts, making favourable credit terms etc. to promote their sales.
- **Shape of the Demand curve:** A large number of firms sell closely related but differentiated products. A firm, in order to sell more, must reduce its price. Hence, the demand curve in monopolistic competition is downward sloping. This demand curve is **more elastic**, that is, percentage change in quantity demanded is more than percentage change in price because products have close substitutes in the market.

($E_d > 1$)



OLIGOPOLY ----FEATURES:

- **Few firms:** There are few large firms. Each firm produces a sizable portion of total output. Severe competition exists between these few large firms. Each tries to manipulate price as well as production to gain larger market size.
- **Interdependence between the firms:** Action of one firm determines the action of other firms. A change in output or price by one firm, evokes reaction from other firms.
- **Non price competition:** Though firms are in a position to influence the prices, they try to avoid Price-war following the policy of price rigidity. To compete with each other, these firms use other methods of non-price competition like advertising better services, better credit terms etc.
- **Barriers to entry of firms:** Patents, requirement of large capital, control over important raw materials are a few reasons which prevent new firms from entering into the industry. Only those firms who have the capacity to cross these barriers can enter the market. This implies that the firms keep on earning abnormal profits in the long run as well.
- **Selling costs:** Through sales promotion techniques, Advertisements, etc firms under Oligopoly compete with its rivals and hence it is an important feature of this market.
- **Nature of the product:** These firms may produce homogeneous, such as, cement or steel or differentiated product such as, automobiles.
- **Shape of the Demand curve:** Behaviour pattern of a producer cannot be determined because firms are heavily dependent on the actions of its rivals. Any change in the price or output policy by one, may result in different responses by its competitors. Hence, Demand curve under oligopoly is **indeterminate** and keeps on shifting. In the diagram below, we can see that the demand curve is more elastic from d to P while it becomes less elastic from P to D. Hence, it is also known as the KINKED demand curve.



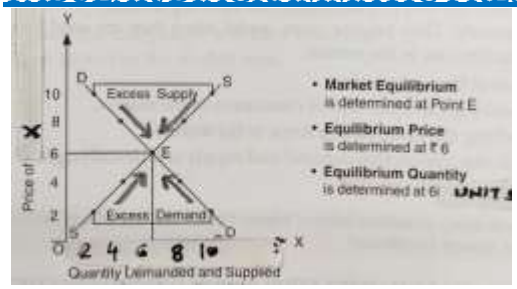
: Kinked Demand Curve under oligopoly

PRICE DETERMINATION UNDER PERFECT COMPETITION:

EQUILIBRIUM PRICE: The price at which quantity demanded of a commodity is equal to quantity supplied.

EQUILIBRIUM QUANTITY: The quantity demanded and supplied at the equilibrium price.

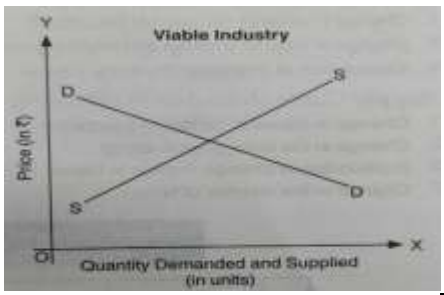
TABULAR/DIAGRAMMATIC PRESENTATION :

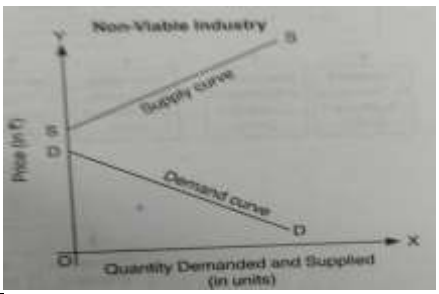


Price of good X (Rs.)	Market Dd. Of X (units)	Market Supply of X (units)	Shortage/ Surplus	Remarks
2	10	2	-8	Excess Demand (Market Dd.>Market Supply)
4	8	4	-4	
6	6	6	0	Equilibrium Level (Market Dd.=Market Supply)
8	4	8	+4	Excess Supply (Market Supply>Market Dd.)
10	2	10	+8	

VIABLE INDUSTRY: Refers to an industry for which supply curve and demand curve intersect each other in positive axes.

NON VIABLE INDUSTRY: Refers to an industry for which supply curve and demand curve never intersect each other in the positive axes.



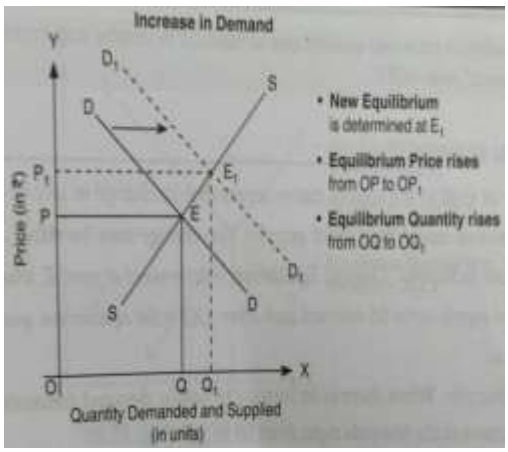


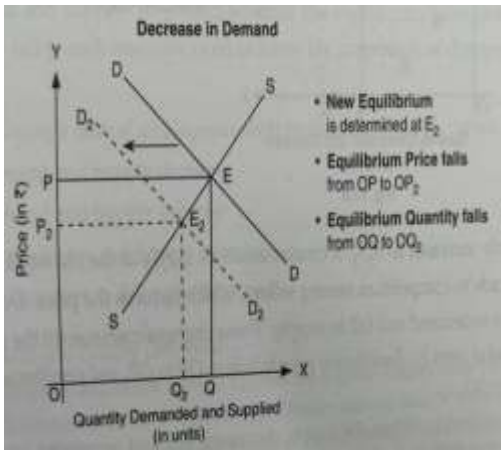
EFFECTS OF CHANGES IN DEMAND AND SUPPLY ON MARKET EQUILIBRIUM :

If there is any change which leads to shift in either demand or supply curve or both, then equilibrium price and equilibrium quantity are bound to change.

❖ WHEN ONLY DEMAND CHANGES:

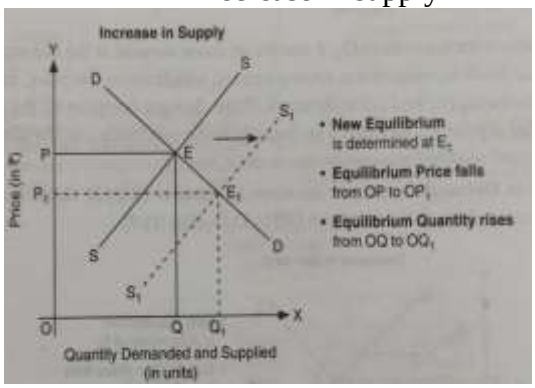
- Increase in demand
- Decrease in demand

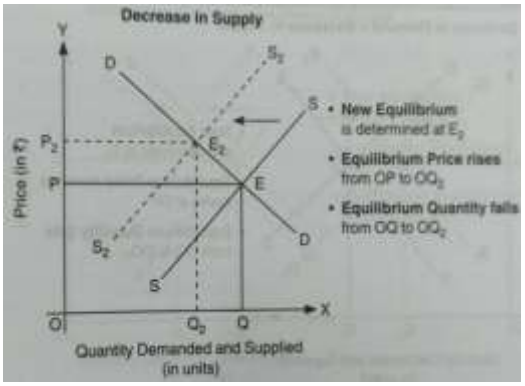




❖ WHEN ONLY SUPPLY CHANGES:

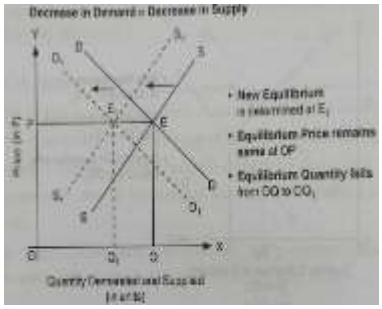
- Increase in supply
- Decrease in supply

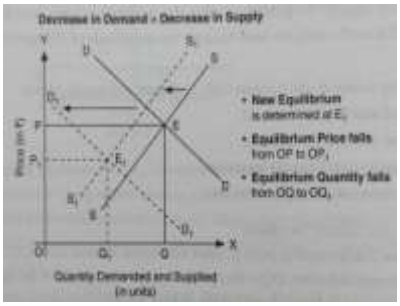


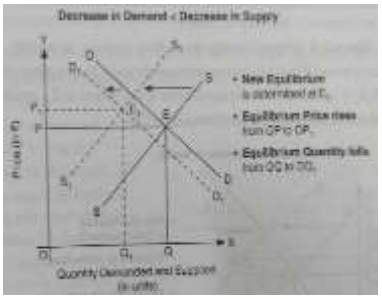


❖ WHEN BOTH DEMAND AND SUPPLY CHANGE:

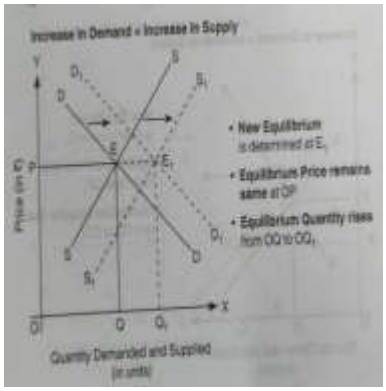
- **<u>Both demand and supply decrease:</u>**
  - ✓ Decrease in demand is equal to decrease in supply.
  - ✓ Decrease in demand is greater than decrease in supply.
  - ✓ Decrease in demand is less than decrease in supply.

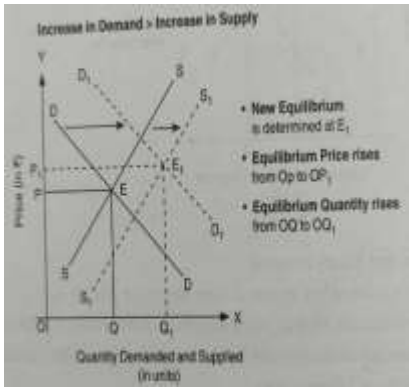


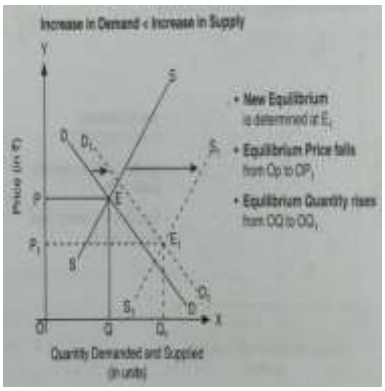




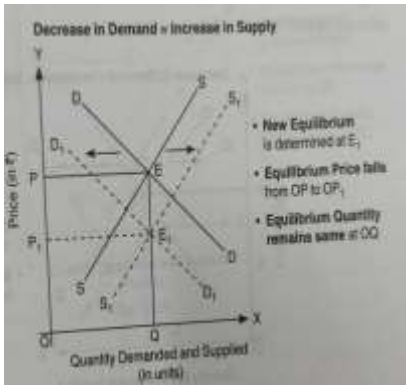
- **Both demand and supply increase:**
  - ✓ Increase in demand is equal to increase in supply.
  - ✓ Increase in demand is greater than increase in supply.
  - ✓ Increase in demand is less than increase in supply.

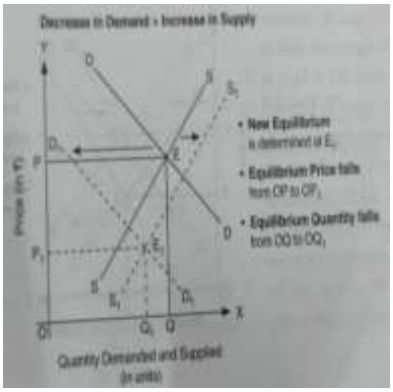


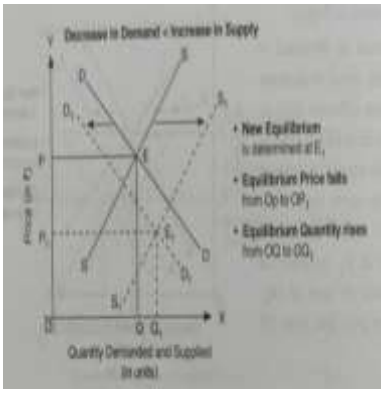




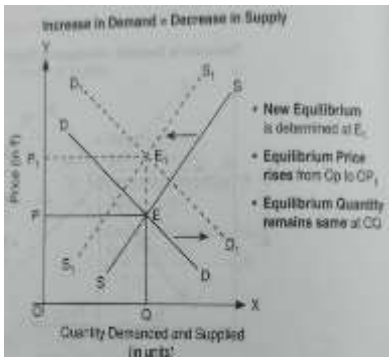
- **Demand Decreases and supply increases:**
  - ✓ Decrease in demand is equal to Increase in supply.
  - ✓ Decrease in demand is greater than Increase in supply.
  - ✓ Decrease in demand is less than Increase in supply.

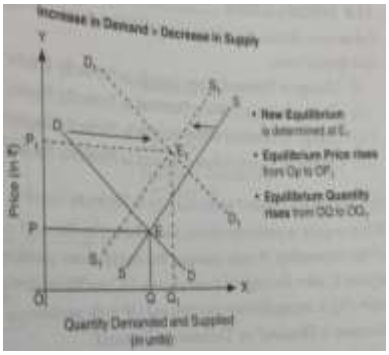


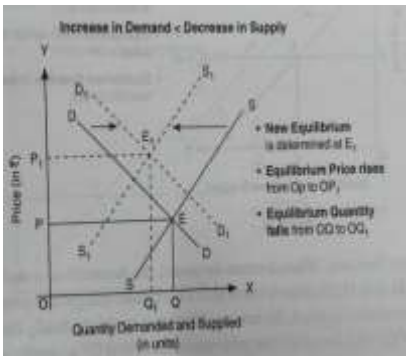




- **Demand Increases and supply Decreases:**
  - ✓ Increase in demand is equal to Decrease in supply.
  - ✓ Increase in demand is greater than Decrease in supply.
  - ✓ Increase in demand is less than Decrease in supply.

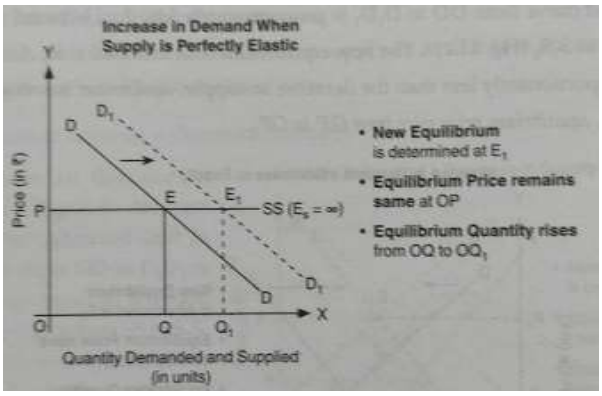


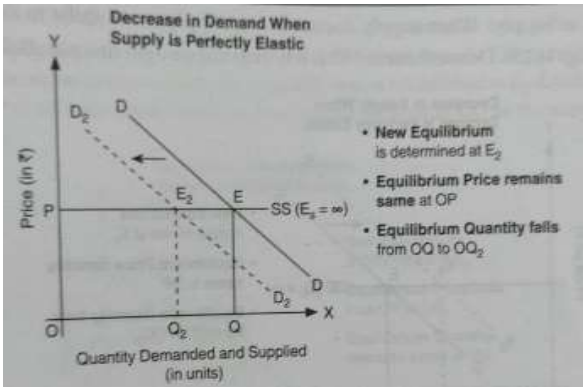




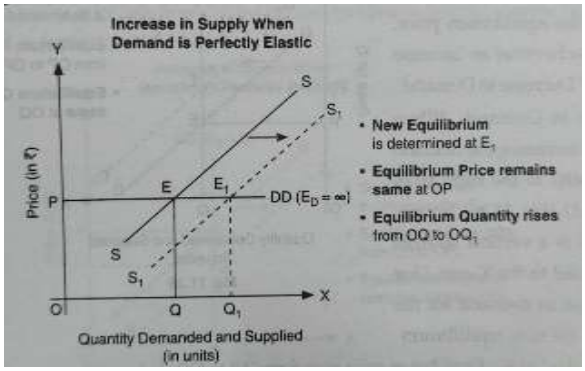
❖ SOME EXCEPTIONAL CASES:

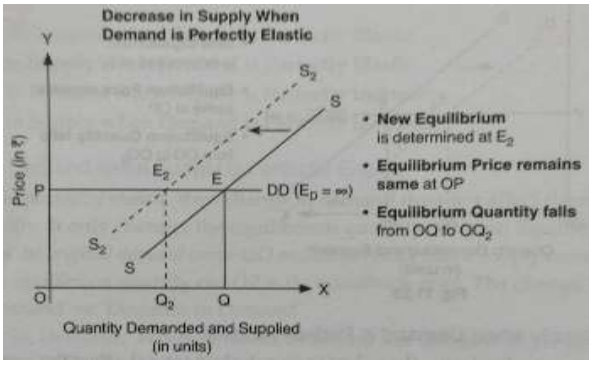
- **Change in demand when supply is perfectly elastic:**
  - ✓ Increase in demand.
  - ✓ Decrease in demand.



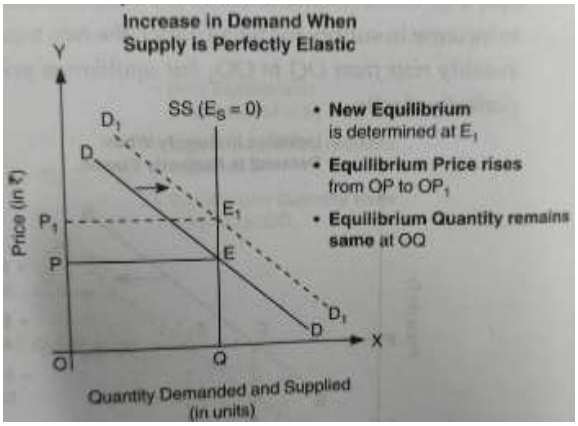


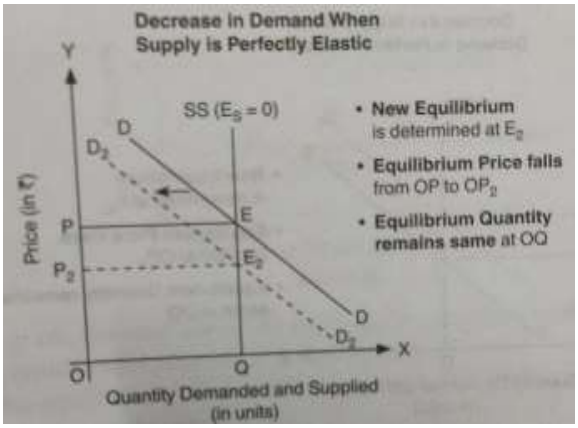
- **Change in supply when demand is perfectly elastic:**
  - ✓ Increase in supply.
  - ✓ Decrease in supply.



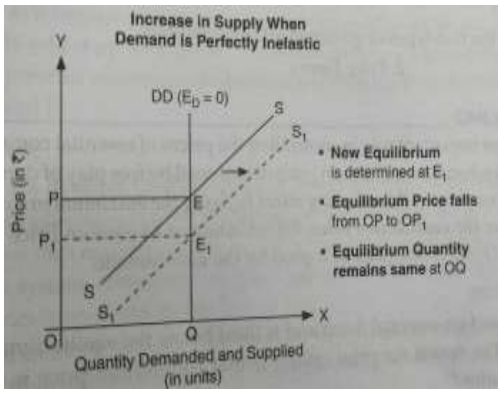


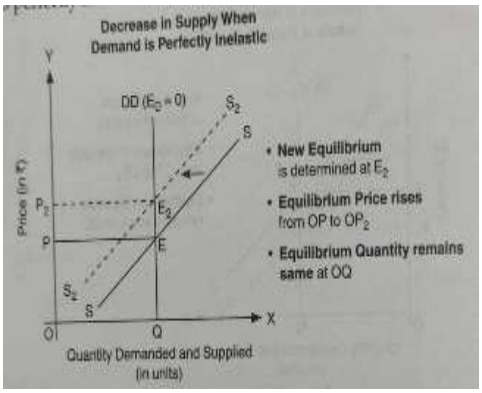
- **Change in demand when supply is perfectly inelastic:**
  - ✓ Increase in demand.
  - ✓ Decrease in demand.





- **<u>Change in supply when demand is perfectly inelastic:</u>**
  - ✓ Increase in supply.
  - ✓ Decrease in supply.

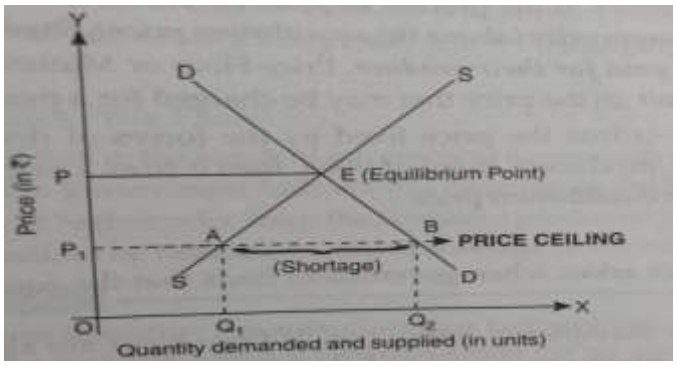




SIMPLE APPLICATIONS OF TOOLS OF DEMAND & SUPPLY CURVES

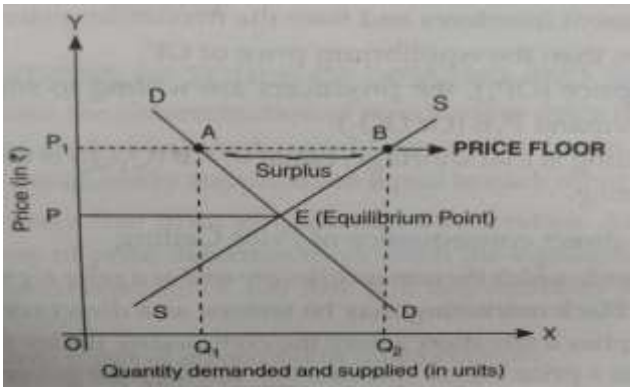
Government has to intervene in the process of price determination when the market equilibrium price is either too high for the consumers or too low for the profitability of the producers. Government may intervene in the commodity market in the following manners:

- **Price ceiling :** It refers to fixing the maximum price of a commodity at a level lower than the equilibrium price which is determined by the market. It is the imposition of upper limit on the price of a good by the government. It is mainly imposed on necessary items when the equilibrium price is too high for the common people to afford.



- In the above diagram, OP is the market determined equilibrium price which is high from the point of view of the poor people.
- The government intervenes and fixes the maximum price at OP_1 which is less than the equilibrium price.
- At this controlled price, the producers are willing to supply only OQ_1, while the consumers demand OQ_2. This creates a shortage of Q_1Q_2 (AB) in the economy.
- As a consequence, it leads to black marketing in which commodities are sold illegally at a price higher than the maximum price fixed by the government.
- To meet the excess demand, Government may enforce the rationing system wherein a minimum quota of essential goods is made available to the poor people at a price less than the market equilibrium price.

- **Price floor Or Minimum Support Price:** It refers to the minimum price fixed by the government when it feels that the price fixed by the forces of demand and supply are not remunerative from producer's point of view. It is the imposition of lower limit on the price that may be charged for a particular good or service. Price floor is fixed above the equilibrium price determined by the market. Example, Price support programs in Agriculture & Minimum Wage Legislation.



- In the above diagram, OP is the equilibrium Market Price.
- To protect producers' interest, so that they are keen for further production, government declares OP_1 as the minimum price which is more than OP.
- At OP_1, the producers are willing to supply OQ_2, while consumers demand only OQ_1. This creates a surplus of Q_1Q_2 (AB) in the economy.
- This excess supply may be purchased by the government either to increase its buffer stocks or for exports.

KENDRIYA VIDYALAYA SANGATHAN ZIET Chandigarh
Session ending Examination 2022-23
कक्षा Class : - XI
अर्थशास्त्र Economics

निर्धारित समय 03 : घंटे *अधिकतम अंक : 8 0*

Time allowed: 03 Hours *Maximum Marks: 80*

सामान्य निर्देश:

i इस प्रश्नपत्र में दो भाग है

भाग अ – आर्थिक सांख्यिकी (40 अंक)

भाग ब – व्यष्टि अर्थशास्त्र (40 अंक)

दोनों खंडों के सभी प्रश्न अनिवार्य हैं| प्रत्येक प्रश्न के निर्धारित अंक उसके सामने दिए गए हैं|

ii.प्रश्न संख्या-1 10 तथा 18-27 अति लघुतरात्मक प्रश्न हैं ,जिनमे प्रत्येक का 1 अंक हैं | प्रत्येक प्रश्न का उत्तर एक शब्द या एक वाक्य में ही अपेक्षित हैं|

iii.प्रश्न संख्या 11-12 तथा 28-29 लघुतरात्मक प्रश्न हैं ,जिनमे प्रत्येक के 3 अंक हैं | प्रत्येक का उत्तर सामान्यत6 :-80 शब्दों से अधिक नहीं होना चाहिए|

iv.प्रश्न संख्या 13-15 तथा 30-32 भी लघुतरात्मक प्रश्न हैं ,जिनमे प्रत्येक के 4 अंक हैं | प्रत्येक का उत्तर सामान्यत :80-100 शब्दों से अधिक नहीं होना चाहिए|

v.प्रश्न संख्या 161-7 तथा 33-34 व्याख्यात्मक उत्तर वाले प्रश्न हैं ,जिनमे प्रत्येक के 6 अंक हैं | प्रत्येक का उत्तर सामान्यत100 :-150 शब्दों से अधिक नहीं होना चाहिए|

vi.उत्तर संक्षिप्त तथा तत्थात्मक होने चाहिए तथा ऊपर दी गई सीमा के अंतर्गत ही दिए जाने चाहिए

General Instructions:

i. This question paper contains two parts:

Part A - Statistics for Economics (40 marks)

Part B – Micro Economics (40 marks).

All questions in both the sections are compulsory. Marks for questions are indicated against each.

ii. Questions No.1 – 10 and 18 – 27 are very short-answer questions carrying 1 mark each. They are required to be answered in one word or one sentence each.

iii. Questions No. 11–12 and 28 – 29 are short-answer questions carrying 3 marks each. Answers to them should not normally exceed 60-80 words each.

iv. Questions No. 13 – 15 and 30 – 32 are also short-answer questions carrying 4 marks each. Answers to them should not normally exceed 80-100 words each.

v. Questions No. 16 – 17 and 33 – 34 are long-answer questions carrying 6 marks each. Answers to them should not normally exceed 100-150 words each.

vi. Answers should be brief and to the point and the above word limits should be adhered to as far as possible.

खण्ड –अ (आर्थिक सांख्यिकी) Section –A Statistics for Economics

1 निम्न में से अंकगणित माध्य ज्ञात करने की विधि कौनसी नहीं है ? 1

अ(प्रत्यक्ष विधि ब) संक्षिप्त विधि

स(पद विचलन द) कार्ल पियर्शन विधि

Which is not a method to find arithmetic mean?

a) Direct Method
b) Short-cut method
c) Step-deviation method
d) Karl Pearson's method

सरल सहसंबंध गुणांक का परास_____होता है। 1

अ) शून्य से अनंत तक

ब) ऋणात्मक एक से धनात्मक एक तक

स) ऋणात्मक अनंत से धनात्मक अनंत तक

द) शून्य से एक तक

The range of simple correlation co-efficient is

a) Zero to Infinity
b) Minus One to plus One
c) Minus Infinity to Infinity
d) Zero to one

3 यदि rxy=0 है तो चर X और Y के बीच 1

अ) रेखीय संबंध होगा

ब) अरेखीय संबंध होगा

स) स्वतंत्र होगे ।

द) उपरोक्त में से कोई नहीं।

If rxy=0 then the variables X and Y are

a) Linearly related
b) Not Linearly related
c) Independent
d) None of these

4 मांग व कीमत में क्या संबंध है : 1

क) धनात्मक ख) ऋणात्मक

ग) कोई संबंध नहीं घ) इनमें से कोई नहीं

Relation between price and demand is :

a) Positive
b) Negative
c) no relationship
d) none of these

5 लासपीयर विधि के अंतर्गत सूचकांक निकालने का सूत्र लिखिए 1

अथवा

फिशर विधि के अंतर्गत सूचकांक निकालने का सूत्र लिखिए ।

State the formula of calculation index number under Laspeyres Method.

Or

State the formula of calculation index number under Fisher's Method.

नीचे दिये गए काल्पनिक मामले को ध्यान से पढ़िये और उसके आधार पर प्रश्न 6 से प्रश्न 9 तक उत्तर दीजिये।

संखिकीय आंकड़े दो प्रकार से प्राप्त किए जा सकते है।प्राथमिक स्त्रोत और द्वितीयिक स्त्रोत।अनुसंधानकर्ता जांच द्वारा या अनुसंधान करके आंकड़ें एकत्रित कर सकता है ।ऐसे आंकड़े प्राथमिक आंकड़ें कहलाते है। यदि आंकड़ें किसी दूसरी संस्था द्वारा पहले ही एकत्रित और प्रयोग किए गए हो तो वे द्वितीयिक आंकड़ें कहलाते है । ये या तो प्रकाशित स्त्रोतों या वेब साइट से प्राप्त किए जाते है। एक और जहां प्राथमिक आंकड़ें अधिक विशुद्ध होते है , वहीं दूसरीओर द्वितीयिक आंकड़ो में धन, समय और मेहनत की बचत होती है।आंकड़ों को एकत्रित करने का सबसे आसान तरीका प्रश्नवली होता है।प्रश्नवली प्रश्नों का एक समूह होती है जो अनुसंधान से संबन्धित होते है ।एक प्रश्नवली बनाते समय निम्नलिखित बातों का ध्यान रखना चाहिए।

1. जहां तक हो सके प्रश्नों की संख्या कम से कम हो।
2. प्रश्न सांख्यिकी अनुसंधान से संबन्धित होने चाहिए।
3. गणना करने वाले प्रश्नों से बचना चाहिए।
4. आबंटन से पहले मार्गदर्शी सर्वेक्षण होना चाहिए।

Read the following hypothetical case study carefully and answers the question numbers 6-9 on the basis of same.

Statistical data can be obtained from two sources. Primary sources and Secondary sources. The investigator may collect the data by conducting an enquiry or an investigation. Such data are called primary data. If the data have already been collected and used by some other agency, they are called secondary data. They can be obtained either from published sources or from any other source, for example –a website. Where primary data is more accurate, on the other side, secondary data saves money, time and energy. The most common type of instrument used in collecting data is questionnaire. It is a set of questions related to statistical enquiry. While preparing a questionnaire, we should keep in mind the following points.1. The number of questions should be minimum as possible. 2. The questions should be related to enquiry. 3. No mathematical /calculation question should be asked. 4. Pilot survey should be conducted before mass circulation.

6 _____(प्राथमिक/ द्वितीयिक)आंकड़े जो अनुसंधान कर्ता द्वारा एकत्रित किए जाते है। 1

The data which is collected by investigator is called_____ (Primary data/ Secondary data.)

7 एक पत्रिका से प्राप्त सूचना _____(प्राथमिक आंकड़ो/ द्वितीयिक आंकड़ों का उदाहरण है। 1

Information from a magazine is the example of_____(Primary data/Secondary data.)

8 _____ आंकड़े अधिक विश्वशनीय होते है | 1

_____ data are more reliable.(complete the sentence)

9 निम्नलिखित में से कौनसा एक अच्छी प्रश्नावली का गुण नहीं है। 1

अ) प्रश्नों की कम संख्या

ब) आसान प्रश्न

स) गणना वाले प्रश्न

द) अनुसंधान से संबन्धित प्रश्न

Which are not characteristics of a good questionnaire?

a) Limited no. of questions b) Simple questions

c) Mathematical questions d)Questions related to enquiry

10 जब हम समंको को संख्यात्मक रूप में वर्गीकृत करना चाहे तो समंक वर्गीकरण की किस विधि का प्रयोग किया जाता है 1

(a) गुणात्मक वर्गीकरण

(b) मात्रात्मक वर्गीकरण

(c) समयगत वर्गीकरण

(d) सथति वर्गीकरण

When we want to classifying the data in the numerical term, which method of classification of data is used?

(a)Qualitative classification

(b) Quantitative classification

(c) Chronological classification

(d) Conditional classification

11 निम्नलिखित आंकड़ो की सहायता से मध्यका की गणना कीजिये 3

Calculate median with the help of following data

अंक Marks	0-10	10-20	20-30	30-40	40-50
Number of students विद्यार्थियों की संख्या	3	4	15	6	8

12 समान्तर माध्य के कोई दो गुण तथा अवगुण लिखिए। 3

Write down two merits and demerits of mean.

Or

निम्नलिखित सारणी कक्षा 11 के विद्यार्थियों के अर्थशास्त्र में प्राप्तांकों को दर्शा रही है। गणितीय माध्यकी गणना कीजिए।

The following table shows marks in Economics of the students of class XI. Calculate arithmetic mean.

अंक Marks	विद्यार्थियोंकीसंख्या No. of students
2	5
4	10
6	15
8	10
10	5

13 निम्नलिखित आँकड़ों की सहायता से वृत्त आरेख बनाइये । 4

मद	भोजन	ईंधन	कपड़े	अन्य
कुल खर्च (रू.)	480	360	240	120

Draw a Pie diagram from the following data-

Item of expenditure	food	Fuel	Cloth	Misc.
Total expenditure in Rs.	480	360	240	120

Or अथवा

नीचे सारणीवार सकल घरेलू उत्पाद क्षेत्रकवार अनुमानित संवृधि दर को प्रस्तुत किया गया है |

वर्ष	कृषि एंव संबंद्धक क्षेत्रक	उद्योग	सेवाएं
1994-95	5.0	9.2	7.0
1995-96	-0.9	11.8	10.3
1996-97	9.6	6.0	7.1
1997-98	-1.9	5.9	9.0
1998-99	7.2	4.0	8.3
1999-2000	0.8	6.9	8.2

उपर्युक्त आंकडों को बहु काल-श्रेणी आरेख द्वारा प्रस्तुत करें |

The following table shows the estimate sector wise growth rate in GDP

Year	Agri and Allied	Industry	Services
1994-95	5.0	9.2	7.0
1995-96	-0.9	11.8	10.3
1996-97	9.6	6.0	7.1
1997-98	-1.9	5.9	9.0
1998-99	7.2	4.0	8.3
1999-2000	0.8	6.9	8.2

Represent the data as multiple time series graphs.

14 चर X और Y के बीच सहसंबंध गुणांक परिकलित कीजिये। 4

X	2	3	4	5	6	7	8
Y	-3	-2	-1	0	1	2	3

Calculate the correlation coefficient between X and Y.

X	2	3	4	5	6	7	8
Y	-3	-2	-1	0	1	2	3

15 निम्नलिखित आंकडों के लिए समूहन सारणी और विशलेषण सारणी का प्रयोग करते हुए बहुलक अंक का परिकलन कीजिए| 4

अंक	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
छात्रों की संख्य	4	10	25	15	23	22	12	3

Find Mode from the following data by the use of Grouping and analysis table

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students	4	10	25	15	23	22	12	3

16 अ) सांख्यिकी को परिभाषित कीजिए | सांख्यिकी की मुख्य विशेषताएँ लिखिए | 6

A) Define statistics and write the main features of statistics.

ब)सरकार और नीति –निर्माता आर्थिक विकास के लिए उपयुक्त नीतियों के निर्माण के लिए सांख्यिकी आंकड़ो का प्रयोग करते है | दो उदाहरण सहित व्याख्या कीजिए |

B) 'The Government and policy makers use statistical data to formulate suitable policies of economic development'. Illustrate with two example

17 उपभोक्ता कीमत सूचकांक के महत्व की व्याख्या करें | उपभोक्ता कीमत सूचकांक की गणना करने में कौन सी कठिनाइयाँ आती हैं | 6

Explain the importance of the Consumer Price Index . What are the difficulties in the construction of Consumer Price Index?

Or

निम्न आंकड़ो के लिए

(i) लास्पियर की विधि, (ii) पाशे की विधि, (iii) फिशर की आदर्श विधि

विधि से कीमत सूचकांक ज्ञात करें

मदे	2004		2018	
	मात्रा	कीमत	मात्रा	कीमत
A	8	100	10	120
B	4	60	5	80
C	10	20	12	25
D	12	25	15	30
E	3	5	4	6

Calculate the index numbers from the following data using:

(i) Laspeyre's method, (ii) Paasche's method, (iii) Fisher's ideal method:

मदे Items	2004		2018	
	मात्रा Quantity (Units)	कीमत Price (Rs)	मात्रा Quantity (Units)	कीमत Price (Rs)
A	8	100	10	120
B	4	60	5	80
C	10	20	12	25
D	12	25	15	30
E	3	5	4	6

खण्ड- ब व्यष्टि अर्थशास्त्र Section –B Introductory Microeconomics

18 जब एक फर्म का उत्पादन 20 इकाइयों से बढकर 22 इकाइयां हो जाता है तो उसकी कुल आगम बढ़कर 620 रुपेए से 680 रुपेए हो जाती है तब सीमांत आगम होगी 1

अ) 30 रु ब) 6 रु स) 10 रु द) उपरोक्त में से कोई नहीं

When output of a firm increases from 20 units to 22 units and Total Revenue increases from Rs. 620 to Rs. 680 then Marginal Revenue is____

a) Rs. 30 b) Rs. 6 c) Rs. 10 d)None of these

19 पूर्ति आधिक्य की स्थिति में, बाजार कीमत में _____हो जाती है। 1

अ) वृद्धि ब) कमी स) कोई परिवर्तन नहीं द) उपरोक्त सभी

In the situation of excess **Supply**, market price tends to

a) Rise b) Fall c) Remains constant d) All of above

20 अधिकतम कीमत का अर्थ बताइये। 1

Give the meaning of price ceiling.

21 सही या गलत बताइये। 1

सीमान्त उत्पादन धनात्मक होने पर कुल उत्पादन में कमी हो सकती है |

State true or false.

Total Production can decrease when marginal production is positive.

22 _____बाजार के अंतर्गत समरूप उत्पाद होता है? 1

अ) पूर्ण प्रतियोगी बाजार ब) एकाधिकार बाजार

स) एकाधिकारात्मक प्रतियोगी बाजार द) अल्पाधिकार बाजार

अथवा

शून्य उत्पादन स्तर पर कुल लागत ..... के बराबर होती है |

Under which market homogeneous products are found?
(choose the correct alternative)

a) Perfect Competition Market b) Monopoly Market
c) Monopolistic Competition Market d) Oligopoly Market.

OR

At zero level of output AC is equal to ……

23 एक वस्तु का पूर्ति वक्र के साथ ऊपर की ओर संचलन का कारण होता है:- 1

अ)वस्तु की कीमत में कमी ब)वस्तु की कीमत में वृद्धि

स)वस्तु की मांग में वृद्धि द)वस्तु की मांग में कमी

Cause of upward movement along the supply curve of a commodity is: -

a) Decrease in Price of a commodity b) Increase in Price of a commodity
c) Increase in supply of a commodity d) Decrease in supply of a commodity

नीचे दिये गए काल्पनिक मामले को ध्यान से पढ़िये और उसके आधार पर प्रश्न 24 से प्रश्न 27 तक उत्तर दीजिये।

मांग से आशय एक वस्तु की उन विभिन्न मात्राओं से है जो उस वस्तु के सभी उपभोक्ता उसकी दी गई कीमतों पर खरीदने के इच्छुक है।एक वस्तु की मांग केवल उसकी अपनी कीमत द्वारा ही प्रभावित नहीं होती बल्कि कई दूसरे कारक भी मांग को प्रभावित करते है जैसे –संबन्धित वस्तुओं की कीमतें – संबन्धित वस्तुए दो प्रकार की होती है –स्थानापन्न और पूरक वस्तुएं। , इन दोनों मामलों में,एक वस्तु की कीमत में परिवर्तन दूसरी संबन्धित वस्तु की मांग को प्रभावित करती है। उपभोक्ता की आय भी वस्तु की मांग को प्रभावित करती है।आय के आधार पर , वस्तुए दो प्रकार की होती है-सामान्य वस्तु और घटिया वस्तु।अर्थशास्त्री कहते है की कोई भी वस्तु सामान्य और घटिया नहीं होती। यह उपभोक्ता की आय के स्तर पर निर्भर करती है।सामान्य वस्तु वह उस्तु होती है जिनकी मांग उपभोक्ता की आय के बढ़ने के कारण बढ़ती है और विलोमश:। घटिया वस्तु में विपरीत होता है।उपभोक्ता की रुचि और प्राथमिकता, जनसंख्या का आकार और सरकारी नीति भी एक वस्तु की मांग को प्रभावित करती है जिन्हे मांग के निर्धारक कारक कहा जाता है।

Read the following hypothetical case study carefully and answers the question numbers 24-27 on the basis of same.

Demand refers to various quantities of a commodity that all the buyers are willing to buy at given prices during a given period of time. Not only own price of a commodity but also many other factors also affect the demand of a commodity. Such as price of the related goods-there are two types of related goods 1. Substitute goods 2. Complementary goods. In these cases, change in the price of one good also affects the demand of related good. Income of the consumers- on the basis of income, there are two types of goods-normal good and inferior goods. Economists say that there is no inferior or normal goods. It depends on the income level of the consumer. One good may be inferior for one person but the same good may be normal for another person. Normal goods are those goods whose demand increases with an increase in the income of consumer and vice –versa. Reverse happens in case of inferior goods. Taste and preference of the consumer, size of the population and government policy also affect the demand of a commodity which is known as determinants of demand.

24 एक वस्तु की कीमत और उसकी मांग में _____(सीधा/विपरीत) संबंध होता है। (सही विकल्प चुनिये) 1

There is _____ (direct/Inverse) relationship between price of a commodity and its demand. (Choose the correct option)

25 यदि X वस्तु की कीमत बढ़ने से Y वस्तु की मांग बढ़ जाती है तब दोनों वस्तुएं _____ (पूरक/ स्थानापन्न) होगी। 1
(सही विकल्प चुनिये)

If the price of X good rises then the demand of Y good also rises then both goods are_____(Complementary/Substitute). (Choose the correct option)

26 घटिया वस्तु की मांग में वृद्धि उपभोक्ता की आय में _____(वृद्धि/ कमी) के कारण होती है। (सही विकल्प चुनिये) 1

Demand for inferior good rises due to _____(Fall/Rise) in the income of the consumer. (Choose the correct option)

27 निम्नलिखित में से कौनसा मांग का निर्धारक नहीं है? 1

वस्तु की अपनी कीमत ब) उपभोक्ता की आय

स) एक वस्तु की प्रकृति द) जनसंख्या का आकार

Which are not determinants of demand of a commodity?

a) Own price of a commodity b) Income of the consumer

b) Nature of a commodity d) Size of population

28 पूर्ण प्रतियोगी बाजार की कोई तीन विशेषताओं का वर्णन कीजिये। 3

अथवा

न्यूनतम कीमत अवधारणा को समजाइए।

Explain any three features of perfect competition market.

OR

Explain the concept of Price floor.

29 एक उबभोक्ता दो केवल वस्तुओं X और Y का उपभोग करता है।X और Y की सीमांत उपयोगिता क्रमश: 10 और 8 है । X वस्तु की कीमत 3

और Y वस्तु की कीमत 4 रुपेए है । क्या उपभोक्ता संतुलन में है?उभोक्ता की क्या प्रतिक्रिया होगी? कारण दीजिये।

A consumer consumes only two goods X and Y. Marginal utilities of X and Y are 3 and 4 respectively. Price of X and price of Y is Rs. 4 per unit. Is consumer in equilibrium? What will be further reaction of the consumer? Give reason.

30 सीमांत लागत और औसत लागत की बीच क्या सम्बन्ध है? चित्र की सहायता से व्याख्या कीजिए| 4

What are the relation between Marginal cost and average cost? Explain with help of diagram.

31 किसी वस्तु की मांग में वृद्धि उसकी संतुलन कीमत और संतुलन मात्रा को कैसे प्रभावित करती है? अपने उत्तर के समर्थन में आरेख का प्रयोग कीजिए। 5

How does an increase in demand of a commodity affect its equilibrium price and equilibrium quantity? Use a diagram in support of your answer.

32 दो-दो उदाहरण देते हुये व्यष्टि अर्थशास्त्र और समष्टि अर्थशास्त्र के अर्थों को समजाइए। 4

अथवा

दो-दो उदाहरण देते हुये वास्तविक अर्थशास्त्र और आदर्शात्मक अर्थशास्त्र के अर्थों को समजाइए।

Explain the meanings of Microeconomics and Macroeconomics with two examples each.

OR

Explain the meanings of positive economics and normative economics with two examples each.

33 तटस्थता वक्र की किन्ही तीन विशेषताओं का वर्णन कीजिए। 6

अथवा

तटस्थता वक्र की सहायता से उपभोक्ता के संतुलन निर्धारण का सचित्र वर्णन कीजिये।

Explain any three properties of Indifference curve.

OR

उपभोक्ता संतुलन को परिभाषित करें | तटस्थाता वक्र के आधार पर व्याख्या करें |

Define consumer equilibrium. Explain consumer Equilibrium under I C approach

34 उत्पादन फलन को परिभाषित करें | परिवर्तन शील अनुपात के नियम की तालिका तथा चित्र सहित व्याख्या करें | 6

Define Production Function. Explain the Law of Variable Proportion with the help of schedule and diagram.

MS खण्ड –अ (आर्थिक सांख्यिकी) Section –A Statistics for Economics

1	D)	Karl Pearson's method	1
2	B)	Minus One to plus One	1
3	C)	Independent	1
4	B)	Negative	1
5			1

$$P_{01}=\frac{\sum p_1 q_0}{\sum p_0 q_0}\times 100$$

$$P_{01}=\sqrt{\frac{\Sigma p_1 q_0}{\Sigma p_0 q_0}\times\frac{\Sigma p_1 q_1}{\Sigma p_0 q_1}}\times 100$$

6	Primary data	1
7	Secondary data	1
8	Primary data	1
9	C) Mathematical questions	1
10	(b) Quantitative classification	1

11 Calculate median with the help of following data 3

N = ∑fi∑fi = 36

N/2 = 36/2 = 18

Median Class is 20 - 30

l = 20, f = 15, cf = 7, h = 10

Using Median formula:

Median =l+[n2−cf]×h=l+[n2−cf]×h

= 20 + [(18 - 7)/15] × 10

= 20 + (11/15) × 10

= 20 + (110/15)

= 20+7.33

=27.33

अंक Marks	Number of students विद्यार्थियों की संख्या	CF
0-10	3	3
10-20	4	7
20-30	15	22
30-40	6	28
40-50	8	36

12 Merits 1) Arithmetic mean rigidly defined by Algebraic Formula. 2) **It is easy to calculate and simple to understand**. 3) It is based on all observations of the given data. 4) It is capable of being treated mathematically hence it is widely used in statistical analysis 3

Demerits 1) it can neither be determined by inspection or by graphical location. 2) Arithmetic mean can not be computed for qualitative data like data on intelligence honesty and smoking habit etc. 3) It is too much affected by extreme observations and hence it is not adequately represent data consisting of some extreme point.

Or

arithmetic mean.

अंक Marks	विद्यार्थियोंकीसंख्या No. of students	FX
2	5	10
4	10	40
6	15	90
8	10	80
10	5	50
	Σ N= 45	Σ X= 270

$\bar{x} = \Sigma f_x/N$

270/45=6 Marks

13 % age of expenditure 40 30 20 10 4

Exp of com of 360^0 144 108 72 36

Or

Right Point plot with different line/curve , value on both axis, table showing data with graph, scale and overall

14 4

X	x=X-$\bar{X}$	x^2	Y	y=Y-$\bar{Y}$	y^2	xy
2	-3	9	4	-6	36	18
3	-2	4	7	-3	9	6
4	-1	1	8	-2	4	2
5	0	0	9	-1	1	0
6	1	1	10	0	0	0
7	2	4	14	4	16	8
8	3	9	18	8	64	24
ΣX=35 N=7 $\bar{X}$=5	Σx=0	Σx^2 = 28	ΣY=70 N=7 $\bar{Y}$=10	Σy=0	Σy^2 =130	Σxy=58

NOTE: USE FORMULA AND STEPS

ANS=0.96

15 Grouping table 4

Analysis table

Mode Group 40-50

Z= L1+ (fi-fo)/2fi-fo-f2*i

Z=40+(23-15)/(2*23-15-22)*10

Z=48.89

16 Statistics deals with collection, presentation , analysis and interpretation of quantative information. 6

Characteristics of Statistics

Statistics are numerically expressed.
It has an aggregate of facts.
Data are collected in systematic order.
It should be comparable to each other.
Data are collected for a planned purpose.

Or

'The Government and policy makers use statistical data to formulate suitable policies of economic development'. Illustrate with two example

Statistics is useful in analysing economic problem such as growing population, rising price, demand and supply, unemployment, poverty etc.

Any two example related to use of statistics by the Govt to analysing ,to understand and to solve the economic problems

(or relevant answer)

17 The CPI is **one of the most commonly used tools to measure inflation and deflation**. Inflation is an important indicator of an economy's health. Governments and central banks use the CPI and other indices to make economic decisions 6

The production of index numbers is fraught with challenges. Following are the difficulties faced in the Construction of Index Numbers –

1. Difficulties in Choosing a Base Period:
2. Problem in Commodity Selection:
3. Problems in Price Compendium:
4. Difficulty in Choosing a Statistical Approach:
5. Difficulties Resulting from Changes Over Time:
6. It is not possible to make a comparison:
7. It is not possible to make comparisons between different locations:
8. Not Appropriate to Individuals:

Or

	Base Year		Current Year					
Commodity	**Price p_0**	**Quantity q_0**	**Price p_1**	**Quantity q_1**	p_0q_0	p_0q_1	p_1q_0	p_1q_1
A	8	100	10	120	800	960	1000	1200
B	4	60	5	80	240	320	300	400
C	10	20	12	25	200	250	240	300
D	12	25	15	30	300	360	375	450
E	3	5	4	6	15	18	20	24
					Σp_0q_0 = 1555	Σp_0q_1 = 1908	Σp_1q_0 = 1935	Σp_1q_1 = 2374

(i) Laspeyre's Method

$p_{01}=\Sigma p_1q_0/\Sigma p_0q_0\times100$

$=1935/1555\times100$

124.44

p01=Σp1q0Σp0q0×100

=1935/1555×100

=124.44

(ii) Paasche's Method

$p_{01}=\Sigma p_1q_1/\Sigma p_0q_1\times100$

$=23741908\times100$

=124.42

p01=Σp1q1/Σp0q1×100

=23741908×100

=124.42

(iii) Fisher's Method

$p_{01}=\sqrt{\Sigma p_1q_0/\Sigma p_0q_0\times\Sigma p_1q_1/\Sigma p_0q_1}\times100$

$p_{01}=\sqrt{1935/1555\times2374/1908}$ X100

$\Rightarrow p_{01}=124.43$

खण्ड- ब व्यष्टि अर्थशास्त्र Section –B Introductory Microeconomics

18 c) Rs. 10 1

19 b) Fall 1

20 A price ceiling is the mandated maximum amount a seller is allowed to charge for a product or service. 1

21 false. 1

22 a) Perfect Competition Market 1

OR

AFC

23 b) Increase in Price of a commodity 1

24 Inverse 1

25 Substitute 1

26 Fall 1

27 a) Nature of a commodity 1

28 Main features of perfect competition are as under – 3

(i) Large number of buyers and sellers - Under perfect competition buyers and sellers are in such a large number so that neither a single buyer nor a single seller can influence the market. It is because each seller sells a very small portion of the market supply, similarly the demand of each buyer is also very small in the market.

(ii) Homogeneous product - The product sold in the market is homogeneous or identical in all respect i.e. shape, size, colour, composition, etc.

(iii) Free entry and exit of firms - Under perfect competition there are no barrier to entry and exit of firms in industry. But entry and exit may take time so it happens only in long runs.

(iv)Perfect knowledge of market- In this market all the sellers as well as buyers have the complete information about the market situation. It means they are well aware about the product and its price.

(v) Perfect mobility – The factors of production i.e. land, labour, capital and entrepreneur are perfectly mobile. There is no geographical and occupational restriction on their movement. It means factors of production are free to move from one place to another place and one job to another job in which they get better price.

Or

Support price (Floor Price):- When government fixes price of a product at a level higher than equilibrium price, it is called support price (or floor price). Floor means the lowest limit. Control price or floor price is the minimum price at which a commodity can be purchased. As a result, the supply becomes in excess of demand. Support price is fixed to safeguard the interests of producers. This price is sometimes called floor price because it is the minimum price fixed by the government. Government generally fixes floor price for mostly agricultural products like food grains, sugar, etc.

29 According to the utility approach, a consumer reaches equilibrium where the following equality is met. 3

MUx/Px=MUy/Py

According to the given question:

MUx/Px =3/4=0.75

MUy/Py =4/4=

PyMUy.

is greater that PxMUx

Thus, the consumer is not in equilibrium. In order to reach the equilibrium, a rational consumer would increase the consumption of good Y and decrease that of good X.

30 Relationship between marginal cost and average cost 4

(i)When marginal cost is less than average cost, average cost falls.

(ii) When marginal cost is equal to average cost, average cost is minimum.

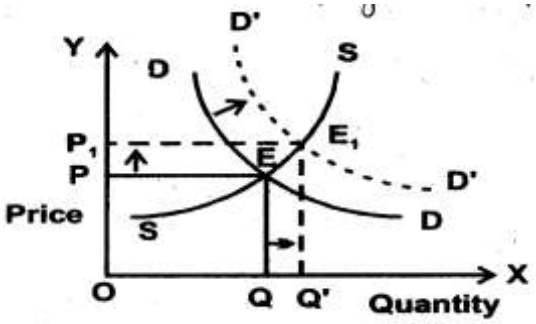
(iii)When marginal cost is greater than average cost, average cost rises.

31 An increase in demand of a commodity results in a rightward shift of demand curve which lead to increase in price. It can be explain by diagram as follow- 4

In the diagram, demand and supply of good are equal at point E. So E is equilibrium point. At this point OP is equilibrium price and OQ is equilibrium

quantity. When demand increases, demand curve shifts to right i.e. D1 D1, then at OP price there is EF excess demand. This results competition among buyers which will raise the price. At a higher price, quantity demanded will fall and quantity supplied will increase, resulting in upward movement along new demand curve and given supply curve

This reduces the gap between quantity demanded and quantity supplied. These changes will continue till we reach the new equilibrium point E1 where quantity demanded is equal to quantity supplied.



32 **A) Difference between micro and macro economics** 4

	Micro Economics	Macro Economics
i	Microeconomics is the branch of economics which study individual economic variable / unit.	Macroeconomics is the branch of economics which study economy as whole and its aggregates.
ii	The main tools of micro economics are demand and supply.	The main tools of macro economics are aggregate demand and aggregate supply.
iii	The main problem studied is price determination.	The main problem studied is income and employment determination.
iv	Microeconomics Is a partial equilibrium analysis.	Macro economics is a general equilibrium analysis.
v	The major microeconomic variables are price, individual consumer's demand, wages, rent, profit, revenue, etc.	The major macroeconomic variables are aggregate price, aggregate demand, aggregate supply, inflation, unemployment, etc.

Or

Difference between Positive and Normative Economics

Parameters	Positive Economics	Normative Economics
Meaning	A part of economics grounded on information and certainty is positive economics.	A part of economics grounded on values, perspectives, and discernment is normative economics.
Nature	Illustrative	Dictatorial
Outlook	Objective	Subjective
Deals with	What actually is?	What has to be?
Testing (Trial)	Statements can be tested	Statements cannot be tested
Economic problems	Evidently elucidates the economic concerns and issues	Provides a solution for the economic concerns, based on the value.

33 **Indifference curve** is a curve which shows various combinations of two goods which give same level of satisfaction to the consumer. 6

Properties or Feature of Indifference curve-

1. **IC is downward sloping -** It is always downward sloping because IC assumes that the combination of both the goods gives a certain level of satisfaction to the consumer. So, in order to increase the consumption of one commodity consumer has to decrease the consumption of another commodity.

2. **IC is convex to origin -** It is convex to origin because of decreasing Marginal rate of substitution (MRS). This is because, as the consumer has more and more units of X, its marginal significance to him declines. So he is willing to give up less and less units of Y for an increment in X.

3. **Higher IC shows higher level of satisfaction -** As compared to lower IC, certainly higher IC show higher level of satisfaction. It is because higher IC has more quantity of one good without reducing quantity of another good.

4. ICs do not intersect each other - Each IC represents different level of satisfaction, so there intersection is ruled out.

Or

Consumer's Equilibrium - A consumer shall be in equilibrium where he can maximize his satisfaction subject to his budget constraint and does not want to bring any change in it.

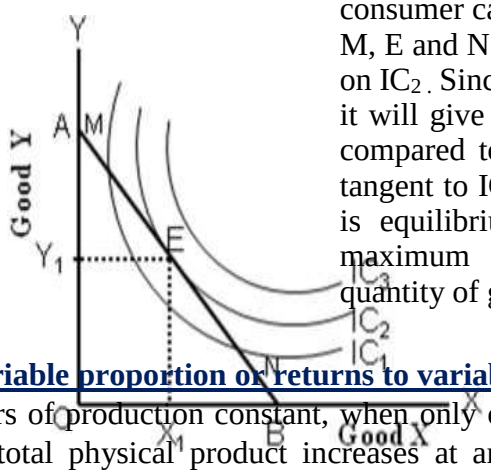
Indifference curve approach explains the consumer equilibrium with the help of indifference map and budget line.

Conditions of Consumer's Equilibrium - If consumer is consuming two goods say good X and good Y. Then at equilibrium point-

i) Budget line should be tangent to indifference curve i.e. slope of indifference curve and budget line is equal to each other. It means $MRSXY = \frac{P_X}{P_Y}$

ii) Indifference curve should be convex to the point of origin i.e. MRS_{XY} is decreasing.

We can explain it with the help of following diagram-



In diagram, AB is budget line and three indifference curves are IC_1, IC_2 and IC_3. The various combinations of good X & good Y which consumer can purchase with his given income are M, E and N. But M & N lie on IC_1 whereas E lies on IC_2. Since E is on higher indifference curve, so it will give more satisfaction to the consumer as compared to M & N. At point E budget line is tangent to IC_2 , and IC_2 is convex to origin. So E is equilibrium point where consumer will get maximum satisfaction by consuming OX_1 quantity of good X and OY_1 quantity of good Y.

34 **Law of variable proportion or returns to variable factor** - This law state that keeping other factors of production constant, when only one variable factor is increased, in the beginning total physical product increases at an increasing rate, then increases at a decreasing rate and ultimately decline. 6

This law is applicable in short period only.

This law has three phases-

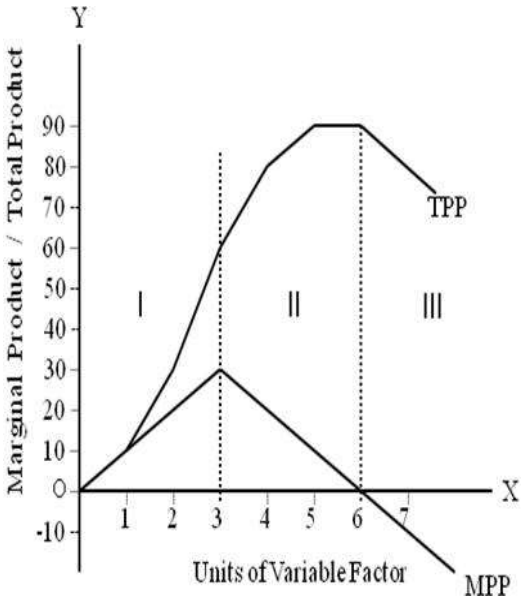
I- Increasing returns to a factor - In this phase MPP increases so TPP increases at an increasing rate. Reasons for increasing returns to a factor are - better utilisation of fixed factor, increase in efficiency of variable factor, indivisibility of fixed factors.

II- Diminishing returns to a factor - In this phase MPP decreases but positive so TPP increases at decreasing rate .This phase ends when MPP is zero & TPP is maximum. Reasons for diminishing returns is that factors of production are imperfect substitutes of each other and after optimum combination of factors when more and more units of variable factors are increased, pressure of production start falling on fixed factors and MPP start decreasing.

III-Negative returns to a factor - In this phase MPP becomes negative so TPP decreases. It happens when variable factor become too much as compared to fixed factors then coordination between variable and fixed factor become very poor and efficiency of factors decrease.

Explanation: The law of variable proportion can be explained with the help of a schedule and a diagram as follows.

Fixed factor Land in acres	Variable factor [Units]	MPP [Units]	TPP [Units]	Phase
1	0	-	0	
1	1	10	10	I
1	2	20	30	
1	3	30	60	
1	4	20	80	
1	5	10	90	II
1	6	0	90	
1	7	-10	80	III



In above table and diagram-

- First unit to third unit MPP increasing so TPP increases at an increasing rate.

  Therefore it's a phase of increasing return.

- Fourth unit to sixth unit MPP decreasing but positive & TPP increases at decreasing rate. Therefore it's a phase of decreasing return.

- Sixth unit onward MPP become negative & TPP is decreasing. Therefore it's a phase of negative return.

SAMPLE PAPER 2022-23

CLASS XI (030) ECONOMICS

Max Marks: 80 Duration : 3 Hrs

SET-I

GENERAL INSTRUCTIONS:

1. This question paper contains two sections:
Part A – Statistics For Economics
Part B – Introductory Micro Economics

2. This paper contains 20 Multiple Choice Questions type questions of 1 mark each.
3. This paper contains 4 Short Answer Questions type questions of 3 marks each to be answered in 60 to 80 words.
4. This paper contains 6 Short Answer Questions type questions of 4 marks each to be answered in 80 to 100 words.
5. This paper contains 4 Long Answer Questions type questions of 6 marks each to be answered in 100 to 150 words.

सामान्य निर्देश:

1. इस प्रश्न पत्र में दो खंड हैं:

भाग ए - अर्थशास्त्र के लिए सांख्यिकी

भाग बी - परिचयात्मक सूक्ष्म अर्थशास्त्र

2. इस प्रश्न-पत्र में 20 बहुविकल्पीय प्रश्न हैं, जिनमें से प्रत्येक 1 अंक का है।

3. इस प्रश्न-पत्र में 4 लघु उत्तरीय प्रश्न हैं, जिनमें से प्रत्येक के 3 अंक हैं, जिनका उत्तर 60 से 80 शब्दों में देना है।

4. इस प्रश्न-पत्र में 6 लघु उत्तरीय प्रश्न हैं, जिनमें से प्रत्येक के 4 अंक हैं, जिनका उत्तर 80 से 100 शब्दों में देना है।

5. इस प्रश्न-पत्र में 6-6 अंकों के 4 दीर्घ उत्तरीय प्रश्न हैं जिनका उत्तर 100 से 150 शब्दों में देना है।

PART –A

भाग ए

STATISTICS FOR ECONOMICS

अर्थशास्त्र के लिए सांख्यिकी

1. Which economic activity deals with manufacturing of goods? 1
   a. Consumption
   b. Exchange
   c. Production
   d. Distribution

   १. कौन सी आर्थिक गतिविधि वस्तुओं के निर्माण से संबंधित है?

   अ) उपभोग

   ब) अदला बदली

   स) उत्पादन

   ड) वितरण

2. The word “statistics” used as: 1
   a. Singular
   b. Plural
   c. . Singular and Plural both
   d. None of These

   २. शब्द "सांख्यिकी" के रूप में प्रयोग किया जाता है:

   अ) विलक्षण

   ब) बहुवचन

   स) एकवचन और बहुवचन दोनों

   ड) इनमें से कोई नहीं

3. The quickest method to collect Primary data. 1
   a. Direct personal investigation
   b. Indirect oral investigation
   c. Telephone interview
   d. Mailed questionnaire method

३. प्राथमिक डेटा एकत्र करने का सबसे तेज़ तरीका।

अ) प्रत्यक्ष व्यक्तिगत जांच

ब) अप्रत्यक्ष मौखिक जांच

स) टेलीफोन साक्षात्कार

ड) डाक प्रश्नावली विधि

4. In an ordered series, the data are: 1
   a. In descending order
   b. In ascending order
   c. Either a or b
   d. None of these

४. एक क्रमबद्ध श्रृंखला में, डेटा हैं:

अ) घटते क्रम में

ब) बढ़ते क्रम में

स) या तो ए या बी

ड) इनमें से कोई नहीं

5. The heading of the row given in the first column of a table are called: 1
   a. Stubs b. Titles
   c. Captions d. Prefatory notes

५. किसी तालिका के पहले कॉलम में दी गई पंक्ति के शीर्षक कहलाते हैं:

अ)स्टब्स

ब) टाइटल

स) कैप्शन

ड) प्रीफ़ेटरी नोट्स

Or

State the meaning of the term 'Variable'

'परिवर्तनीय' शब्द का अर्थ बताएं

6. The value of all the items taken into consideration in the calculation of: 1
   a. Median
   b. Mean
   c. Mode
   d. Index number

६. गणना में ध्यान में रखी गई सभी वस्तुओं का मूल्य:

अ) माध्यिका

ब) माध्य

स) मोड

ड) सूचकांक

7. Median of 2, 3, 8, 4, 9, 6, 5, is _____ 1
   a. 9
   b. 8
   c. 5
   d. 6

७ 2, 3, 8, 4, 9, 6, 5, की माध्यिका है

अ) 9

ब) 8

स) 5

ड) 6

Or

Define Mean

माध्य परिभाषित करें

8. The correlation between sale of woolen cloth and summer season is: 1
   a. positive correlation
   b. negative correlation
   c. Zero
   d. None of these.

   ८. ऊनी कपड़े की बिक्री और गर्मी के मौसम के बीच संबंध है:

   अ) सकारात्मक संबंध

   ब) नकारात्मक सहसंबंध

   स) शून्य

   ड) इनमें से कोई नहीं

9. What are limits of the coefficient of correlation? 1
   a. -1 and 0
   b. No limits
   c. 0 and 1
   d. -1 and 1 including the limits

   ९. सहसंबंध के गुणांक की सीमाएं क्या हैं?

   अ) -1 और 0

   ब) असीम

   स) 0 और 1

   ड) -1 और 1 सीमा सहित

10. In most of the weighted numbers, the weight pertains to: 1
    a. Base year
    b. Current year
    c. Both current year and base year.
    d. None of these.

    १०. अधिकांश भारित संख्याओं में भार संबंधित होता है:

    अ) आधार वर्ष

    ब) चालू वर्ष

    स) चालू वर्ष और आधार वर्ष दोनों।

    ड) इनमें से कोई नहीं।

11. Find out the median from the following data. 3

X	106	150	152	161	156
Y	5	8	6	3	7

११. निम्नलिखित आँकड़ों से माध्यिका ज्ञात कीजिए.

X	106	150	152	161	156
Y	5	8	6	3	7

12. What kind of relationship exist between X and Y, if the point of scatter diagram falls near a straight line with negative slope. Use diagram in support of your answer. 3

OR

On what basis does the base year taken into consideration to calculate index number?

१२. यदि स्कैटर आरेख का बिंदु ऋणात्मक ढलान वाली एक सीधी रेखा के निकट आता है, तो X और Y के बीच किस प्रकार का संबंध होता है। अपने उत्तर के समर्थन में आरेख का प्रयोग कीजिए।

या

सूचकांक संख्या की गणना के लिए आधार वर्ष को किस आधार पर ध्यान में रखा जाता है?

13. Draw Histogram and Frequency polygon with the help of following data. 4

Wages	0 -20	20 - 40	40 -60	60 -80	80 - 100
No. of Workers	28	46	54	42	30

OR

Present the following data with the help of suitable diagram.

YEAR	Production (in '000 tonnes)		
	Wheat	Rice	Cotton
2014	35	22	10
2015	15	25	16
2016	40	12	20

१३. निम्नलिखित आँकड़ों की सहायता से आयत चित्र और बारंबारता बहुभुज बनाइए:

Wages	0 -20	20 - 40	40 -60	60 -80	80 - 100
No. of Workers	28	46	54	42	30

या

निम्नलिखित आँकड़ों को उपयुक्त आरेख की सहायता से प्रस्तुत कीजिए।

वर्ष	उत्पादन ('000 टन में)		
	गेहूं	चावल	कपास
2014	35	22	10
2015	15	25	16
2016	40	12	20

14. Write the four uses of consumer price Index Number. 4

OR

Define Mode. Write its three Demerits.

१४. उपभोक्ता मूल्य सूचकांक के चार उपयोग लिखिए।

या

मोड को परिभाषित करें। इसके तीन दोष लिखिए।

15. Compute the coefficient of rank correlation from the following data. 4

X	87	22	33	75	37
Y	29	63	52	46	48

१५. निम्नलिखित आँकड़ों से रैंक सहसंबंध के गुणांक की गणना करें।

X	87	22	33	75	37
Y	29	63	52	46	48

16. Use Ogive to represent the following data and locate the Median. 6

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No of Students	3	4	8	10	3	2

OR

Calculate Karl Pearson Coefficient of correlation from the following Data.

X	10	12	14	12	16	20
Y	22	26	24	27	31	33

१६. निम्नलिखित आँकड़ों को निरूपित करने के लिए तोरण का प्रयोग कीजिए और माध्यिका ज्ञात कीजिए।

अंक	0-10	10-20	20-30	30-40	40-50	50-60
छात्रों की संख्या	3	4	8	10	3	2

या

निम्नलिखित आँकड़ों से सहसंबंध के कार्ल पियर्सन गुणांक की गणना कीजिए।

X	10	12	14	12	16	20
Y	22	26	24	27	31	33

17. What are the different uses of index number? Explain any two. 6

१७. इंडेक्स नंबर के विभिन्न उपयोग क्या हैं? किन्हीं दो की व्याख्या कीजिए.

PART B भाग बी

INTRODUCTORY MICRO ECONOMICS परिचयात्मक सूक्ष्म अर्थशास्त्र

18. Which of the following statement is false? 1

(a) PPC slopes downwards. (b) PPC is concave.

(c) PPC is slope upward. (d) PPC is not convex.

OR

Which of the following is the cause of economic problem?

(a) Scarcity of resources (b)Unlimited wants

(c) Resource have alternative uses (d) All of these

निम्नलिखित में से कौन सा कथन असत्य है?

(ए) पीपीसी नीचे की ओर ढलान। (बी) पीपीसी अवतल है।

(सी) पीपीसी ऊपर की ओर ढलान है। (डी) पीपीसी उत्तल नहीं है

अथवा

निम्नलिखित में से कौन आर्थिक समस्या का कारण है?

(ए) संसाधनों की कमी (बी) असीमित चाहता है

(सी) संसाधन के वैकल्पिक उपयोग हैं (डी) ये सभी।

19. When marginal utility is zero total utility will be …….. 1

(a) Zero (b)100 (c) Maximum (d) minimum

जब सीमांत उपयोगिता शून्य हो तो कुल उपयोगिता …….. होगी।

(ए) शून्य (बी) 100 **(सी) अधिकतम (डी) न्यूनतम**

20. Any statement about demand for a good is considered complete only when the following is/are mentioned in it (Choose the correct alternative) 1

(a) Price of the goods (b) Quantity of the goods

(c) Period of time (d) All of the above

किसी वस्तु की मांग के बारे में कोई भी कथन तभी पूर्ण माना जाता है जब उसमें निम्नलिखित का उल्लेख किया गया हो (सही विकल्प चुनें)

(ए) वस्तु की कीमत (बी) वस्तु की मात्रा

(सी) समय की अवधि (डी) उपरोक्त सभी

21. Floor price is set at ……level by government to protect the …… 1

(a) Above the equilibrium price level , consumer

(b) Below the equilibrium level , consumer

(c) Above the equilibrium price level , Producers

(d) Below the equilibrium level , Producers

सरकार द्वारा …… की सुरक्षा के लिए न्यूनतम मूल्य…… स्तर पर निर्धारित की जाती है

(ए) उपभोक्ता , संतुलन मूल्य स्तर से ऊपर

(बी) उपभोक्ता , संतुलन स्तर के नीचे

(सी) उत्पादकों , संतुलन मूल्य स्तर से ऊपर

(डी) उत्पादकों , संतुलन स्तर से नीचे

22. Read the following statements Assertion (A) and Reason (R). Choose one of the correct alternatives given below: 1

Assertion (A) -Demand for salt is inelastic.

Reason (R) - In case of elastic demand, percentage change in price of the commodity causes relatively less than percentage change in quantity demanded.

Alternatives:
a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).
c) Assertion (A) is true but Reason (R) is false.
d) Assertion (A) is false but Reason (R) is true.

निम्नलिखित कथनों को पढ़ें अभिकथन (ए) और कारण (आर)। नीचे दिए गए विकल्पों में से एक सही विकल्प चुनें:

अभिकथन (ए) -नमक की मांग बेलोचदार होती है।

कारण (आर) - लोचदार मांग के मामले में, वस्तु की कीमत में प्रतिशत परिवर्तन मांग की मात्रा में प्रतिशत से कम परिवर्तन का कारण बनता है।

विकल्प:

क) अभिकथन (ए) और कारण (आर) दोनों सत्य हैं और कारण (आर) अभिकथन (ए) की सही व्याख्या है।

ख) कथन (ए)और कारण (आर) दोनों सत्य हैं और कारण (आर) अभिकथन (ए) की सही व्याख्या नहीं है।

ग) अभिकथन (ए) सही है लेकिन कारण (आर) गलत है।

डी) दावा (ए) गलत है लेकिन कारण (आर) सत्य है।

23. Read the following statements carefully: 1

Statement 1- Tea and coffee are substitute goods.
Statement 2 –Car and petrol are substitute goods.

In the light of the given statements, choose the correct alternative from the following:

a) Statement 1 is true and statement 2 is false.
b) Statement 1 is false and statement 2 is true.
c) Both statements 1 and 2 are true.
d) Both statements 1 and 2 are false.

निम्नलिखित कथनों को ध्यान से पढ़ें:

कथन 1- चाय और कॉफी स्थानापन्न वस्तुएँ हैं।

कथन 2-कार और पेट्रोल स्थानापन्न वस्तुएँ हैं।

दिए गए कथनों के आलोक में, निम्नलिखित में से सही विकल्प का चयन कीजिए:

क) कथन 1 सत्य है और कथन 2 गलत है। **बी) कथन 1 गलत है और कथन 2 सत्य है।**

ग) कथन 1 और 2 दोनों सत्य हैं। **डी) कथन 1 और 2 दोनों असत्य हैं।**

24. Read the following statements carefully: 1

Statement 1- There are large numbers of buyers and few sellers in the perfect competition market.
Statement 2 - In perfect competition market products are heterogeneous.

In the light of the given statements, choose the correct alternative from the following:

a) Statement 1 is true and statement 2 is false
b) Statement 1 is false and statement 2 is true
c) Both statements 1 and 2 are true.
d) Both statements 1 and 2 are false.

निम्नलिखित कथनों को ध्यान से पढ़ें:

कथन 1- पूर्ण प्रतियोगिता बाजार में बड़ी संख्या में खरीदार और कुछ विक्रेता होते हैं।

कथन 2 - पूर्ण प्रतियोगिता में बाजार के उत्पाद विषमांगी होते हैं।

दिए गए कथनों के आलोक में, निम्नलिखित में से सही विकल्प का चयन कीजिए:

क) कथन 1 सत्य है और कथन 2 गलत है **बी) कथन 1 गलत है और कथन 2 सत्य है**

ग) कथन 1 और 2 दोनों सत्य हैं। **डी) कथन 1 और 2 दोनों असत्य हैं।**

25. When price of a good falls from Rs 15 to Rs 12 per unit means a fall of 20% in prices, its demand rises by 25%.Price elasticity of demand will be 1

(a) -15/12 (b) -12/15 (C) -25/20 (d) -20/25

जब एक वस्तु की कीमत 15 रुपये से गिरकर 12 रुपये प्रति इकाई हो जाती है, तो कीमतों में 20% की गिरावट होती है, इसकी मांग में 25% की वृद्धि होती है। मांग की कीमत लोच होगी:

(ए) -15/12 **(बी) -**12/15 **(सी) -**25/20 **(डी) -**20/25

26. Definitely producer will do .....in supply, if the price of normal goods increases.. 1

(a) Minimise (b) Decrease (c) Increase (d) Stop supply.

OR

Read the following statements carefully:
Statement 1-When TR increases at increasing rate then MR also increases.
Statement II-When TR increases at a diminishing rate then MR decline.
In the light of the given statements, choose the correct alternative from the following:
a) Statement 1 is true and statement 2 is false b) Statement 1 is false and statement 2 is true
c) Both statements 1 and 2 are true d) Both statements 1 and 2 are false.

निश्चित रूप से निर्माता आपूर्ति में ..... करेगा, यदि सामान्य वस्तु की कीमत बढ़ जाती है।

(ए) कम से कम (बी) कमी (सी) वृद्धि (डी) आपूर्ति बंद करो।

या

निम्नलिखित कथनों को ध्यान से पढ़ें:

कथन 1- जब टी.आर. बढ़ती दर से बढ़ता है तो मामूली राजस्व भी बढ़ता है।

कथन II जब टी.आर. घटती दर से बढ़ता है तो मामूली राजस्व घट जाता है।

दिए गए कथनों के आलोक में, निम्नलिखित में से सही विकल्प का चयन कीजिए:

क) कथन 1 सत्य है और कथन 2 गलत है। b) **कथन 1 गलत है और कथन 2 सत्य है।**

ग) कथन 1 और 2 दोनों सत्य हैं। d) **कथन 1 और 2 दोनों असत्य हैं।**

27. In a perfect competition market a firm is a price taker and market is a price maker……curve is horizontal straight line parallel to x-axis. 1

(a) Marginal Cost (b) Total Cost (c) Marginal Revenue (d) Total Revenue

एक पूर्ण प्रतियोगिता बाजार में एक फर्म एक मूल्य लेने वाली होती है और बाजार एक मूल्य निर्माता होता है। ……वक्र x-अक्ष के समानांतर क्षैतिज सीधी रेखा है।

(ए) सीमांत लागत (बी) कुल लागत (सी) सीमांत राजस्व (डी) कुल राजस्व

28. Explain the central problem of in ‘‘choice of technique’’. 3

"तकनीक के चुनाव" की केन्द्रीय समस्या की व्याख्या कीजिए।

29. What is the price ceiling? What is the common purpose for the price ceiling imposed by the government? 3

OR

“In perfect competition market a firm is said to be price taker and market is said to be price maker”. Explain.

मूल्य सीमा क्या है? सरकार द्वारा लगाई गई मूल्य सीमा का सामान्य उद्देश्य क्या है?

या

पूर्ण प्रतियोगिता बाजार में एक फर्म को मूल्य लेने वाला कहा जाता है और बाजार को मूल्य निर्माता कहा जाता है"। समझाएँ।

30. Explain with diagram the difference between increase in demand and increase in quantity demanded of a good. 4

किसी वस्तु की माँग में वृद्धि तथा माँग की मात्रा में वृद्धि में अन्तर को चित्र द्वारा स्पष्ट कीजिए।

31. Complete the following table: 4

Output (units)	Average Fixed Cost (Rs)	Average Variable Cost (Rs)	Marginal Cost (Rs)	Total Cost (Rs)
1	120	40	----	-------
2	60	56	----	232
3	----	54	-----	-------
4	30	------	54	----

निम्नलिखित तालिका को पूरा करें:

उत्पादन (इकाइयां)	**औसत स्थिर लागत (रु.)**	**औसत चर लागत (रु.)**	**सीमांत लागत (रु.)**	**कुल लागत (रु.)**
1	120	40	----	-------
2	60	56	----	232
3	----	54	-----	-------
4	30	------	54	----

32. What is the law of variable return to factor? Explain with the help of numerical example and diagram. 4

OR

Differentiate between Fixed factors and Variable factors of production.

कारक पर परिवर्तनशील प्रतिफल का नियम क्या है? संख्यात्मक उदाहरण और रेखाचित्र की सहायता से स्पष्ट कीजिए।

या

उत्पादन के स्थिर कारकों और उत्पादन के परिवर्तनशील कारकों में अंतर स्पष्ट कीजिए।

33. Explain consumer equilibrium with the help of indifference curve analysis. 6

OR

A consumer consumes only two goods X and Y whose prices are Rs 5 and Rs 4 respectively. If the consumer chooses a combination of the two goods with marginal utility of X equal to 4 and that of Y equal to 5, is the consumer in equilibrium? Why or why not? What will a rational consumer do in this situation? Use utility analysis.

उदासीनता वक्र विश्लेषण की सहायता से उपभोक्ता संतुलन की व्याख्या कीजिए।

या

एक उपभोक्ता केवल दो वस्तुओं X और Y का उपभोग करता है जिनकी कीमत क्रमशः5 रुपये और 4 रुपये है। यदि उपभोक्ता X की सीमांत उपयोगिता 4 के बराबर और Y की 5 के बराबर सीमांत उपयोगिता के साथ दो वस्तुओं का संयोजन चुनता है, तो क्या उपभोक्ता संतुलन में है? क्यों या क्यों नहीं? इस स्थिति में एक तर्कसंगत उपभोक्ता क्या करेगा? उपयोगिता विश्लेषण का प्रयोग करें।

34. Explain with numerical example and diagram the conditions of producer's equilibrium in terms of marginal revenue and marginal cost. 6

सीमांत आगम और सीमांत लागत के संदर्भ में उत्पादक के संतुलन की स्थितियों को संख्यात्मक उदाहरण और आरेख के साथ समझाइए।

****

KENDRIYA VIDYALAYA SANGATHAN, CHENNAI REGION
SAMPLE PAPER 2022-23
CLASS XI (030) ECONOMICS
SCORING KEY
SET - I

Q.NO	EXPECTED ANSWER	MARKS
1	d) Production	1
2	c) Singular and Plural Both	1
3	c)Telephone interview	1
4	c)Either (a) or (b)	1
5	a) Stubs (or) Not consistent,liable to change	1 1
6	b)Mean	1
7	(c) 5 (or) It is an average of all items in a series	1 1
8	(b)Negative Correlation	1
9	d)-1 and +1 including limits	1
10	a)Base Year	1

11	Formula (median) (N+1)/2 Steps for calculation Ans =152	2 1
12.	High degree negative correlation Diagram (or) It is the reference year It should be a normal year It should be the year with out much ups and downs	3 3
13	Diagram -Histogram Diagram - frequency polygon (steps and procedures for constructing histogram and drawing frequency polygon) (or) Any suitable diagram can be used Multiple bar diagram may be a better choice (steps and procedures for constructing diagram)	2 2 4
14	a) Formulation of price policy b) Wage adjustment c) Measurement of real value of rupee d) Analysis of market (or) It is the value which occurs most frequently in the series Demerits: a) uncertain and vague b) not capable of algebraic treatment c)difficult procedure of grouping (similar points can be considered)	4 1 3
15	$r' = 1 - 6\sum \frac{d^2}{N(N^2-1)}$ (formula) Steps for calculation Answer (Ans = (-1) Perfect negative correlation.	1 2 1
16.	Calculation of cumulative frequency Completion of table. (a)steps and procedure for drawing o gives (b)location of median (or) Steps for calculation (Ans=0.96) Formula: $r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\,n\Sigma x^2 - (\Sigma x)^2\,][\,n\Sigma y^2 - (\Sigma y)^2\,]}}$ Ans =(0.96) High degree positive correlation	4 2 4 1 1
	17)a)Measurement of changes in price level b) Measurement of change in standard of living c) Useful to government d) Useful to business community. (Brief explanation of any two)	4 2

PART B MICRO ECONOMICS

Q.NO.	EXPECTED ANSWER	MM
18	Q1 Which of the following statement is false? ANS- (c) PPC is slope upward. OR Which of the following is the cause of economic problem? ANS- (d) All of these	1
19	When marginal utility is zero total utility will be …….. ANS-(c) Maximum	1
20	Any statement about demand for a good is considered complete only when the following is/are mentioned in it (Choose the correct alternative) ANS-(d) All of the above	1
21	Floor price is set at ……level by government to protect the …… ANS-(c) Above the equilibrium price level , Producers	½ & 1/2
22	Read the following statements Assertion (A) and Reason (R). Choose one of the correct alternatives given below: Assertion (A) -Demand for salt is inelastic. Reason (R) - In case of elastic demand, percentage change in price of the commodity causes relatively less than percentage change in quantity demanded. Alternatives: ANS-(c) Assertion (A) is true but Reason (R) is false.	1
23	Read the following statements carefully: Statement 1- Tea and coffee are substitute goods. Statement 2 –Car and petrol are substitute goods. In the light of the given statements, choose the correct alternative from the following: ANS- (a) Statement 1 is true and statement 2 is false.	1
24	Read the following statements carefully: Statement 1- There are large numbers of buyers and few sellers in the perfect competition market. Statement 2 - In perfect competition market products are heterogeneous. In the light of the given statements, choose the correct alternative from the 1following: ANS-(d) Both statements 1 and 2 are false.	1
25	When price of a good falls from Rs 15 to Rs 12 per unit means a fall of 20% in prices, its demand rises by 25%.Price elasticity of demand will be ANS-(C) -25/20	1
26	Definitely producer will .....in supply, if the price of normal goods increases.. ANS-(c) Increase OR Read the following statements carefully: Statement 1-When TR increases at increasing rate then MR also increases. Statement II-When TR increases at a diminishing rate then MR decline. ANS- (c) Both statements 1 and 2 are true	1
27	In a perfect competition market a firm is a price taker and market is a price-maker, ……curve is horizontal straight line parallel to x-axis. ANS-(c) Marginal Revenue	1
28	The problems of how to produce is a problem relating to choice of technology. There are two techniques of production: i) Labour Intensive Technique in which labour is used more than capital. ii) Capital Intensive Technique in which capital is used more than labour. An economy must decide as to which technique is to be used so that efficient production is obtained. It is the central problem in every economy because it impacts production or efficiency on the one hand and the degree of employment on the other hand. Higher productivity often implies a lower degree of employment.	1 1 1

29 **Price Ceiling: Price ceiling means the maximum limit that the government imposes on the price of a commodity.** 1

Price ceiling are used by the government to Prevent prices from being too high. The main reason for imposing price ceilings is to protect the interests of the consumers in situations in which they are not able to afford needed commodities. 1

For example during the recent rise in the prices of pulses. Consequence: Shortage of the commodity and Rationing: In case of price ceiling the quantity actually supplied in the market will shrink; as a result a large chunk of consumer's demand will go unsatisfied. To deal with such a situation the government may resort to rationing of the commodity. 1 1

With suitable diagram

1
1
1

OR

Under perfect competition, there is a large number of sellers selling a homogenous product. The price of a commodity under perfect competition is determined by the forces of demand and supply of the product alone in the market so market is called Price Maker.

Every seller accepts the price as given/determined by the industry. No individual firm can influence this price. It only has to decide how much quantity of the commodity it wants to sell. It is because of this that the seller under perfect competition is a price taker.

If a firm in a perfectly competitive market raises the price of its product by so much as a penny, it will lose all of its sales to competitors.

30

2

Increase in Demand	**Increase in Quantity Demanded**
1. Increase in demand refers to increase in the purchase quantity of a commodity at its existing Price	**Increase in quantity demanded refers to increase in the quantity purchase of a commodity due to a fall in its price.**
2. Increase in demand occurs due to change in factors other than price of the commodity.	**Increase in quantity demanded occurs due to change in price of the commodity**
3. Diagrammatically this is shown by a forward or backward shift in demand curve.	**Diagrammatically this is shown by a downward movement on the same demand curve.**
Example-ChangeinIncome, Technology, Taste, etc(Diagram)	**Change in price only(Diagram).**

2

31 Complete the following table:

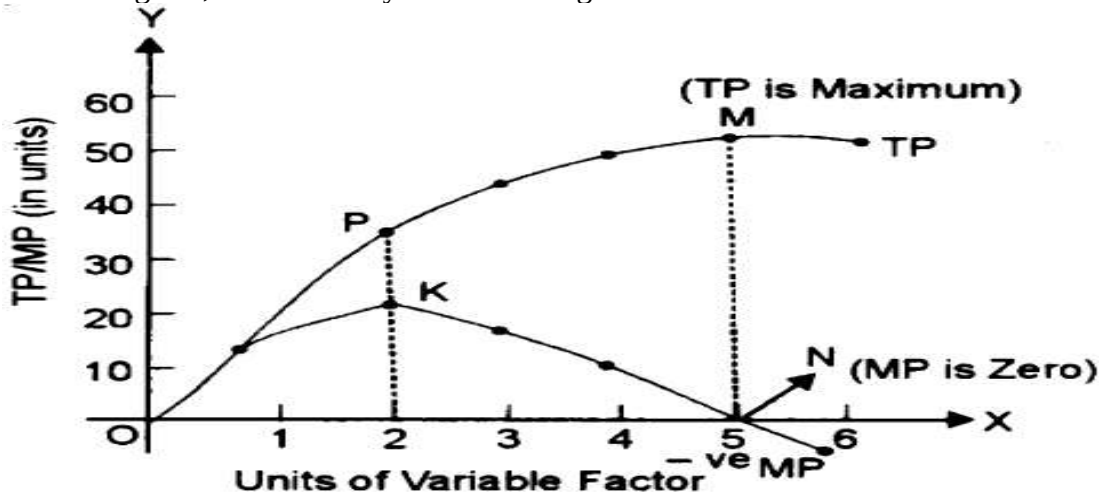
Output (units)	Total Cost (Rs)	TFC	TVC	Average Fixed Cost (Rs)	Average Variable Cost (Rs)	Marginal Cost (Rs)
1	160	120	40	120	40	40
2	232	120	112	60	56	72
3	282	120	162	40	54	50
4	336	120	216	30	54	54

4

32 Law of Variable Proportions or Returns to a Factor

This law exhibits the short-run production functions in which one factor varies while the others are fixed.

The law states that keeping other factors constant, when you increase the variable factor, then the total product initially increases at an increases rate, then increases at a diminishing rate, and eventually starts declining.



1

Fixed factor	Variable factor	Total Product	Marginal Product	Return
1	1	10	10	Increasing return
1	2	25	15	
1	3	45	20	Decreasing return
1	4	55	10	
1	5	55	0	Negative return
1	6	45	-10	

3

OR

Fixed factors	Variable factors
Fixed factors of production are those factors which can't be changed with the change in the level of output in short run.	Variable factors of production are those factors which can be changed with the change in the level of output.
Can change only in long run	Always variable in short as well as long run
Example-Land ,Machine, Building etc	Labour, raw materials etc
Cost of fixed factors can't be zero even at output is zero.	Cost of Variable factors is zero at output is zero.
2Cost is fixed	Cost will be directly proportion to output.

2

2

33 Consumer's Equilibrium in Indifference Curve Analysis is defined as a situation when the consumer maximizes his satisfaction, spending his given income across different goods with the given prices. 1

Here, the indifference curve and budget line are used to determine the consumer equilibrium point. Indifference curve analysis helps to find out how the consumer spends his limited income on the combination of different goods to get maximum satisfaction. 1

Consumer's equilibrium is the amount of goods the consumer can buy in the market given his/her current level of income. There are two conditions for consumers equilibrium:

i) The first is that the budget line should tangent to the indifference Curve .

ii) The marginal rate of substitution of good X for Good Y (MRSxy) must be equal to the price ratio. i.e MRSxy = Px/Py.

Slope of indifference curve= = Slope of Budget Line

The indifference curve should be convex to the origin at the point of tangency. 2

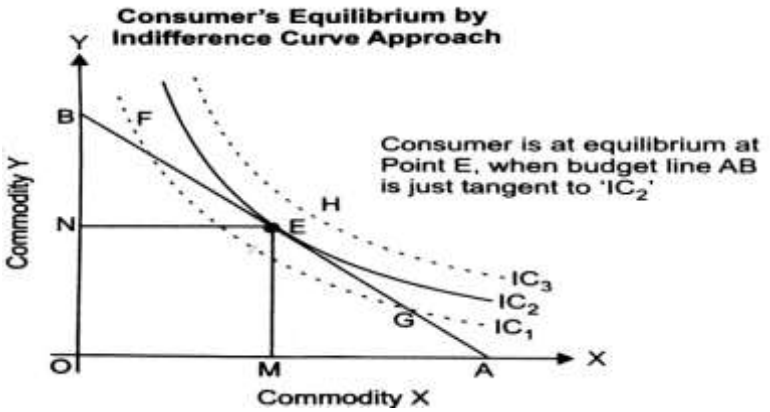
Explanation: In fig, AB is the budget or price line, and IC_1, IC_2 and IC_3 are indifference curves. A consumer can buy any of the combinations whether E,F,G,H of chocolates Dairy Milk, shown on budget line AB. He can't buy any combination on IC_3 as it is beyond the budget line AB. But, he can buy those combinations which are not only on the budget line AB but also coincide with the highest indifference curve which is IC_2. the consumer will be at equilibrium at the combination E. Because, at this point, the budget line AB is tangent to the highest indifference curve IC_2. No doubt, he can afford the combinations F and G as well but these will not give him the maximum satisfaction as these combinations belong to the lower indifference curve IC_1. 2

It means, that the consumer's equilibrium point is the point of tangency of the budget line and indifference curve. At point E, the slope of the indifference curve and budget line coincides. Here,

The slope of the indifference curve is indicative of the marginal rate of substitution of commodity-1 for commodity-2 (MRS_{XY}).

The slope of the budget line is indicative of the ratio of the price of commodity-1(P_1) and the price of commodity -2(P_2).

2



4

OR

Given, PX=Rs. 4; PY=Rs. 5; MUX=Rs. 5; MUY=4

The consumer attains equilibrium when

MUX/PX=MUY/PY

In the given question, the consumer is not in the equilibrium because here,

MUX/PX>MUY/PY

Using the given values, 5/4>4/5

The consumer would react to this situation by increasing the consumption of good X in place of good Y. As consumption of X is increased, MUX will start declining. Likewise, fall in the consumption of Y would cause a rise in MUY. The process of substituting X for Y would continue till MUX/PX (rupee worth of MUX) and MUY/PY (rupee worth of MUY) are equal and the equilibrium is achieved.

---

34 Producer's equilibrium refers to the state in which a producer earns his maximum profit or minimise its losses. According to MR-MC approach, 1

Two conditions under this approach are:

(i) MR = MC

(ii) MC curve should cut the MR curve from below, or MC should be rising. 1

As long as the addition to revenue is greater than the addition to cost. It is profitable for a firm to continue producing more units of output. In the diagram, output is shown on the X-axis and revenue and cost on the Y-axis. The Marginal Cost (MC) curve is U-shaped and P ~ MR = AR, is a horizontal line parallel to X-axis. 1

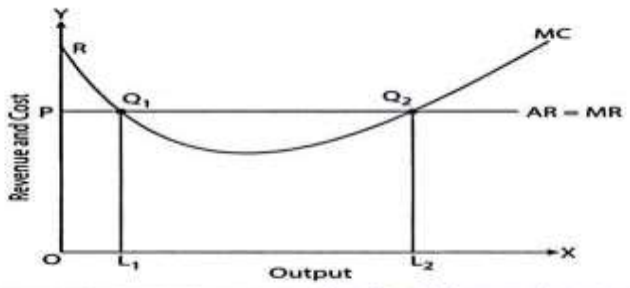
MC = MR at two points Q1 and Q2 in the diagram, but profits are maximised at point Q2, corresponding to Q 10 level of output. Between Q2 and Q10 levels of output, MR exceeds MC. Therefore, firm will not stop at point R but will continue to produce to take advantage of additional profit. Thus, equilibrium will be at point Q2, where both the conditions are satisfied. 1

Situation beyond Q2 level: MR < MC When output level is more than Q10, MR < MC, which implies that firm is making a loss on its last unit of output. Hence, in order to maximise profit, a rational producer decreases output as long as MC > MR. Thus, the firm moves towards producing O Q units of output. 1 1

Table 1. MR, MC and Producer's Equilibrium

Q (Units of Output)	MR (₹)	MC (₹)
1	12	15
2	12	12
3	12	10
4	12	9
5	12	8
6	12	7
7	12	8
8	12	9
9	12	10
10	12	12
11	12	15

FIGURE 1



Note: Fig. 1 is drawn on the assumption that AR is constant for a firm and is equal to OP. It is as in a situation of perfect competition. Constant AR implies constant MR. Accordingly, AR = MR, and both are indicated by a horizontal straight line, parallel to X-axis.

CLASS XI - ECONOMICS -2022-23
BLUE PRINT
PART- A STATISTICS FOR ECONOMICS

SAMPLE QUESTION PAPER FOR SESSION ENDING EXAMINATION

UNIT	Forms of Questions current unit	MCQ (1Mark)	Short Answer1 (3Marks)	Short Answer2 (4Marks)	Long Answer (6Marks)	TOTAL
1 2	**Introduction; & Collection, Organisation & presentation of data**	**1(2)**	**3 (1)**	**4(1)**	**6(1)**	**15**
3	**Statistical tools and interpretation**	**1(8)**	**3(1)**	**4(2)**	**6(1)**	**25**
	PART-B INTRODUCTORY MICROECONOMICS					
4	**Introduction**	**1(4)**	**-**	**-**	**-**	**04**
5	**Consumer's Equilibrium & Demand**	**1(2)**	**3(1)**	**4(1)**	**6(1)**	**15**
6	**Producer Behaviour & Supply**	**1(2)**	**3(1)**	**4(1)**	**6(1)**	**15**
7	**Forms of market & Price determination under Perfect competition**	**1(3)**	**3(1)**	**--**	**-**	**06**
	Total	**1X21=21**	**3X5=15**	**4X5=20**	**6X4=24**	**80**

ECONOMICS
CLASS XI

MAXIMUM TIME :3hr | MAXIMUM MARKS :80

समय सीमा : 3 घंटे | पूर्णांक : 80

GENERAL INSTRUCTIONS

1) All questions in both the sections are compulsory.
2) Question Nos. 1-10 and 18-27 are very short questions carrying 1 mark each. They are required to be answered in one sentence each.
3) Question Nos. 11-12 and 28-29 are short – answer questions carrying 3 marks each. Answer to them should not normally exceed 60 words each.
4) Questions Nos. 13-15 and 30-32 are also short answer questions carrying 4 marks each. Answer to them should not normally exceed 70 words each.
5) Question Nos. 16-17 and 33-34 are long -answer questions carrying 6 marks each. Answer to them should not normally exceed 150 words each.
6) Answer should be brief and to the point and the above word limit be adhered to as far as possible.

सामान्य निर्देश-:

1) दोनों वर्गों में सभी प्रश्न अनिवार्य हैं।
2) प्रश्न संख्या1-10 और17-27अति लघु उत्तरीय प्रश्न है, इनका उत्तरअधिकतम एक वाक्य मे दीजिये।
3) प्रश्न संख्या11 – 12 और 28-29 लघु उत्तरीय प्रश्न है, प्रत्येक के लिये अधिकतम अंक 03 है, इनका उत्तर अधिकतम 60शब्दो मे दीजिये।
4) प्रश्न संख्या13 -15 और 30 -32 लघु उत्तरीय प्रश्न है, प्रत्येक के लिये अधिकतम अंक 04 है, इनका उत्तर अधिकतम 70 शब्दो मे दीजिये।
5) प्रश्न संख्या16 -17 और 33-34 विस्तृत उत्तरीय प्रश्न है, प्रत्येक के लिये अधिकतम अंक 06 है, इनका उत्तर अधिकतम 150 शब्दो मे दीजिये।
6) जवाब संक्षिप्त और बिंदु के लिए होना चाहिए और उपरोक्त शब्द सीमा का यथासंभव पालन किया जाना चाहिए।

PART A (STATISTICS)

Q1. Which of the following is not a feature of a good questionnaire? 1

a) Limited number of questions
b) Proper order of questions
c) Help in cross verification
d) Based on calculations

निम्नलिखित में से कौन सी एक अच्छी प्रश्नावली की विशेषता नहीं है?

क) सीमित प्रश्न संख्या
ख) उचित क्रम में प्रश्न
ग) सत्यापन में मदद
घ) गणना पर आधारित

Q2. Bar diagram is a: 1

a) One-dimensional diagram
b) Two-dimensional diagram
c) Diagram with no dimension
d) None of the above

दंड आरेख है :

क) एकविम आरेख
ख) द्विविम आरेख
ग) विम रहित आरेख
घ) इनमे से कोई नहीं

OR

A questionnaire is

a) A list of answers
b) A list of objectives of the investigation.
c) A list of questions pertaining to the investigation.
d) A list of data.

प्रश्नावली एक :

क) उत्तरों की सूची है

ख) अन्वेषण के उद्देश्यों की एक सूची है

ग) अन्वेषण पर आधारित प्रश्नों की एक सूची है

घ) आंकड़ों की एक सूची है

Q3. The shape of 'Less than Ogive' is : 1
a) Rising Upward
b) Falling Downward
c) Parallel to X-axis
d) Parallel to Y-axis

'से कम' तोरण का आकार :

क) ऊपर की ओर उठता हुआ है

ख) नीचे की ओर गिरता हुआ है

ग) X अक्ष के समानांतर है

घ) Y अक्ष के समानांतर है

Q4. The mean of five numbers is 30. If each of these five numbers is divided by 2, then the new mean will be: 1
a) 15
b) 60
c) 28
d) None of these

पांच अंकों का समानांतर माध्य 30 है I यदि इन पाँच में से हर एक अंक को दो से भाग किया जाए तो नया समानांतर माध्य होगा :

क) 15

ख) 60

ग) 28

घ) इनमे से कोई नहीं

Q5. Define the term Median. 1

मध्यिका की परिभाषा दीजिए I

Q6. If the slope of the straight line in a scatter diagram is negative then the correlation between the variables is: 1
a) +1
b) -1
c) zero
d) None of these

प्रकीर्ण आरेख में यदि सीधी रेखा की ढाल ऋणात्मक हो तो चरों के बीच का सहसंबंध मूल्य होता है :

क) +1

ख) -1

ग) शून्य

घ) इनमे से कोई नहीं

Q7. The Paasche index number is based on: 1
a) Base year quantities
b) Current year quantities
c) Average of current and base years
d) None of the above

पशे का सूचकांक आधारित है :

क) आधार वर्ष के परिमाण पर

ख) वर्तमान वर्ष के परिमाण पर

ग) वर्तमान एवं आधार वर्ष के माध्य पर

घ) इनमे से कोई नहीं

Q8. $\frac{A_2 - A_1}{A_1}$ **X 100** is the formula for specifically measuring :

a) Consumer Price Index 1

b) Rate of Inflation

c) Wholesale Price Index

d) None of these

$\frac{A_2 - A_1}{A_1}$ **X 100** सूत्र विशेषतः मापने के लिए उपयोग में लाया जाता है :

क) उपभोक्ता कीमत सूचकांक को

ख) मुद्रा -स्फीति की दर को

ग) थोक कीमत सूचकांक को

घ) इनमे से कोई नहीं

Q9. Consumer Price Index numbers are used by the Governments to frame policies on ---------(Prices/ Quantities) 1

उपभोक्ता कीमत सूचकांक का प्रयोग सरकार द्वारा ---------- पर नीतियाँ बनाने के लिए किया जाता है I (कीमतों / परिमाणों)

Q10. Choose one of the correct alternatives from the given Assertion & Reason: 1

Assertion(A): Rajiv scored 57 in Mathematics, Ravi scored 98 in Statistics, Anita scored 45 in Economics. The given data is statistical data.

Reason(R): The statistical data needs to be numerical in nature.

a) Both Assertion(A) & Reason(R) are true and R is the correct explanation of A.

b) Both Assertion(A) & Reason(R) are true and R is not the correct explanation of A.

c) Assertion(A) is true but Reason(R) is false.

d) Assertion(A) is false but Reason(R) is true.

दिए गए अभिकथन(A) एवं कारण(R) की सहायता से सही विकल्प का चुनाव करें:

अभिकथन A: राजीव ने गणित में 57, रवि ने सांख्यकी में 98 और अनीता ने अर्थशास्त्र में 45 अंक प्राप्त किये I यह आंकडे सांख्यकीय आंकडे हैं I

कारण R : सांख्यकीय आंकडे संख्यात्मक होने चाहिए I

क) अभिकथन(A) और कारण(R) दोनों सत्य हैं और कारण(R) अभिकथन(A) का सही विवरण है I

ख) अभिकथन(A) और कारण(R) दोनों सत्य हैं और कारण(R) अभिकथन(A) का सही विवरण नहीं है I

ग) अभिकथन(A) सत्य हैं पर कारण(R) गलत है I

घ) अभिकथन(A) गलत हैं पर कारण(R) सही है I

Q11. Following are the wages of 19 worker . Calculate Arithmetic Mean using Assumed Mean Method. 3

19 कर्मचारियों का वेतन नीचे दिया गया है। कल्पित माध्य विधि द्वारा समानांतर माध्य का परिकलन करें।

Wages/वेतन (Rs.)	10	20	30	40	50
No. of workers/श्रमिकों की संख्या	4	5	3	2	5

OR(अथवा)

Following is the daily income of eight persons in a locality. Calculate arithmetic mean using step deviation method.

एक इलाके में रहने वाले आठ व्यक्तियों की दैनिक आय नीचे दी गई है

पद -विचलन विधि द्वारा समानांतर माध्य ज्ञात कीजिए।

Monthly Income/मासिक आय (Rs.) : 70, 30, 500, 60 , 20 , 250, 10 , 40

Q12. The following table gives the data on the marks obtained by three students in four subjects. Represent the data using a Multiple Bar Diagram. 3

तीन विद्यार्थियों द्वारा चार विषयों में अर्जित अंक नीचे सारणी में दिए गए हैं। इन आंकड़ों को बहु -दंड आरेख द्वारा दर्शाइए।

Subject/विषय	Hindi/हिन्दी	Pol.Science/ राजनीति शास्त्र	Geography/भूगोल	History/इतिहास
Lekha/लेखा	85	78	98	88
Seema/सीमा	90	96	96	92
Bharti/भारती	80	70	75	80

Q13. Calculate median from the following figures. 4

निम्नलिखित आंकड़ों की सहायता से मध्यिका का परिकलन करें।

Class interval/वर्ग अंतराल	10-19	20-29	30-39	40-49	50-59	60-69
Frequency/बारंबारता	12	19	20	21	15	13

OR अथवा

Find out mode value from the following data:

निम्नलिखित आंकड़ों की सहायता से बहुलक ज्ञात करें।

Mid value/मध्य मान	15	25	35	45	55	65
Frequency/ बारंबारता	5	8	15	4	6	7

Q14. Calculate correlation between values of X and Y using Karl Pearson method.

कार्ल -पीरसॉन विधि द्वारा X तथा y की के बीच सह-संबंध की गणना करें। 4

X	2	3	1	5	6	4
Y	4	5	3	4	6	2

Q15. Explain the following problems faced in the construction of Index Numbers: 4

a) Selection of Base Year.
b) Selection of goods & services.

सूचकांक के निर्माण में आने वाली निम्नलिखित कठिनाइयों को समझाइए:

क) आधार वर्ष का चुनाव

ख) वस्तुओं तथा सेवाओं का चुनाव

Q16. Define Classification of Data. Bring out the difference between Qualitative & Quantitative classification of data. 6

आंकड़ों के वर्गीकरण की परिभाषा दीजिए। आंकड़ों के गुणात्मक एवं संख्यात्मक वर्गीकरण के बीच अंतर स्पष्ट करें।

Q17. Calculate standard deviation from the given data using Assumed Mean method. 6

दिए गए आंकड़ों की सहायता से मानक विचलन ज्ञात करें।

Age(yrs)/आयु(वर्ष)	20-25	25-30	30-35	35-40	40-45	45-50	50-55
No of workers/कर्मचारियों की संख्या	17	11	8	5	4	3	2

OR अथवा

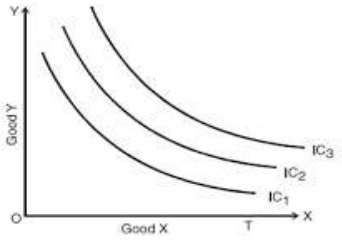
Calculate Mean Deviation and its co-efficient from Median using the given data.

दिए गए आंकड़ों की सहायता से मध्यिका का प्रयोग करते हुए माध्य विचलन तथा माध्य विचलन गुणांक ज्ञात करें।

Size of item/मद का आकार	15	20	25	30	35
Frequency/बारंबारता	2	3	6	7	2

PART – B (MICRO ECONOMICS)

Q.NO	QUESTION	MM
18	Which indifference curve represents the highest level of satisfaction? कौन सा अनधिमान वक्र उच्चतम स्तर की संतुष्टि प्रदान करेगा ?	1



Indifference Map

(a) IC1
(b) IC2
(c) IC3
(d) none of these/इनमे से कोई नहीं

19	Suppose the price of good X is Rs.8/- and the marginal utility(in Rs.) for four units is given as: मान लीजिए की वस्तु x की कीमत रु.8 /- है और चार ईकाइयों के लिए उसकी सीमांत उपयोगिता(रुपए में) इस प्रकार दी गई है :	1

Units/ईकाई	1	2	3	4
Mu_{x} / X की सीमांत उपयोगिता (Rs./रुपए)	12	10	8	6

How many units should a consumer purchase to maximise his satisfaction?
उपभोक्ता को अपनी संतुष्टि को सर्वाधिक करने के लिए कितनी ईकाइयाँ खरीदनी चाहियें ?

20	Price elasticity of demand for flowers and toys are (-)0.9 and (–)0.5 respectively. Demand for which one is more elastic & why? फूलों एवं खिलौनों की मांग की कीमत लोच क्रमशः (-)0.9 और (-)0.5 है। दोनों में से किसकी मांग अधिक लोचशील है और क्यों?	

OR अथवा

Slope of an indifference curve is measured by:
(a) Marginal rate of substitution
(b) Marginal rate of transformation
(c) Marginal opportunity cost
(d) None of these

1

उदासीनता वक्र की ढाल को मापा जाता है :

क) प्रतिस्थापन की सीमांत दर से
ख) रूपांतरण की सीमांत दर से
ग) सीमांत अवसर लागत से
घ) इनमे से कोई नहीं

21	Choose one of the correct alternatives from the given Assertion & Reason: **Assertion(A):** A commodity that can be put to several uses is price inelastic. **Reason(R):** As price falls, number of buyers increase in the market.	1

a) Both Assertion(A) & Reason(R) are true and R is the correct explanation of A.
b) Both Assertion(A) & Reason(R) are true and R is not the correct explanation of A.
c) Assertion(A) is true but Reason(R) is false.
d) Assertion(A) is false but Reason(R) is true.

दिए गए अभिकथन(A) एवं कारण(R) की सहायता से सही विकल्प का चुनाव करें:

अभिकथन A: जिस वस्तु को एक से अधिक प्रयोगों में लाया जा सकता है, उसकी कीमत लोच कम होती है।

कारण R : कीमत गिरने के साथ बाज़ार में खरीददारों की संख्या बढ़ती जाती है।

क) अभिकथन(A) और कारण(R) दोनों सत्य हैं और कारण(R) अभिकथन(A) का सही विवरण है I

ख) अभिकथन(A) और कारण(R) दोनों सत्य हैं और कारण(R) अभिकथन(A) का सही विवरण नहीं है I

ग) अभिकथन(A) सत्य हैं पर कारण(R) गलत है I

घ) अभिकथन(A) गलत हैं पर कारण(R) सही है I

22 As long as MR is positive, TR will : 1

a) Increase
b) Decrease
c) Be Maximum
d) Remain same

जब तक सीमांत आगम धनात्मक है तब तक कुल आगम :

क) बढ़ेगी

ख) घटेगी

ग) सर्वाधिक होगी

घ) समान रहेगी

23 In which market form, there is perfect knowledge among buyers & sellers? 1

a) Oligopoly
b) Monopolistic competition
c) Monopoly
d) None of the above

बाज़ार के किस रूप में क्रेता तथा विक्रेताओं के पास सम्पूर्ण जानकारी होती है?

क) अल्पाधिकार

ख) एकाधिकारिक प्रतियोगिता

ग) एकाधिकार

घ) इनमे से कोई नहीं

24 Why are Selling costs not incurred in Perfect competition? 1

पूर्ण प्रतियोगी बाज़ार में विक्रय लागत क्यों नहीं होती?

25 In the following diagram Producer's equilibrium is achieved at point--------- 1

a) K b) L c) Both K & L d) Neither K nor L

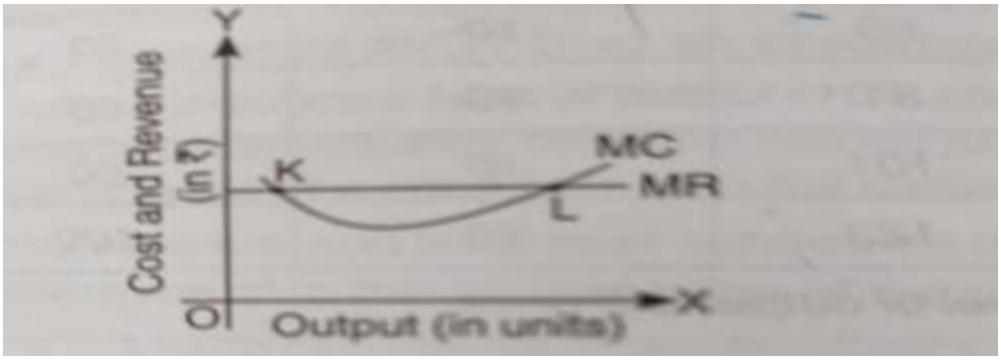
नीचे दिए गए आरेख में उत्पादक संतुलन ----------बिन्दु पर बनता है:

क) K

ख) L

ग) K और L दोनों पर

घ) K और L दोनों पर ही नहीं



26 'Contraction of supply occurs due to change in factors other than price of the given commodity.' State whether the statement is True or False giving reason. 1

"पूर्ति में संकुचन कीमत के अतिरिक्त उसको प्रभावित करने वाले अन्य कारकों के कारण होता है।" कारण सहित बताएँ की यह कथन सही है या गलत।

27 If demand falls in the same proportion as rise in supply how will the market equilibrium react ? 1

a) Equilibrium quantity rises
b) Equilibrium price rises
c) Equilibrium quantity remains same
d) Equilibrium price remains same

यदि मांग में कमी और पूर्ति में वृद्धि एक ही अनुपात में होती है तो बाज़ार संतुलन किस प्रकार से प्रतिक्रिया करेगा ?

क) संतुलित मात्रा में वृद्धि होगी
ख) संतुलित कीमतों में वृद्धि होगी
ग) संतुलित मात्रा समान रहेगी
घ) संतुलित कीमत समान रहेगी

28 When price of a good is Rs 7 per unit, a consumer buys 12 units. The price falls to Rs 6 per unit, and the consumer now spends Rs.72 on that good. Calculate price elasticity of demand using the percentage method. 3

एक वस्तु की कीमत रु.8/ईकाई होने पर उपभोक्ता उसकी 12 ईकाईयां खरीदता है। जब वस्तु की कीमत गिरकर रु.6/ईकाई होती है तो उपभोक्ता उस पर रु.72 खर्च करता है। प्रतिशत विधि द्वारा मांग की कीमत लोच ज्ञात करें।

29 Explain the difference in the slope of AR & MR curves under Monopoly and Monopolistic competition. 3

एकाधिकार एवं एकाधिकारिक प्रतियोगिता के अंतर्गत औसत आगम तथा सीमांत आगम वक्रों की ढाल के बीच अंतर स्पष्ट कीजिए।

OR

Bring out the difference between 'Price Discrimination' and 'Product Differentiation.'

'कीमत विभेद' तथा 'उत्पाद विभेदन ' के बीच अंतर स्पष्ट कीजिए।

30 Given the TFC equal to Rs.60/, complete the following table:

दी गई कुल स्थिर लागत को रु.60/- मानते हुए सारणी को पूरा कीजिए: 4

Outputउत्पादन	AVC(Rs.) औसत परिवर्ती लागत (रु.)	TC(Rs) कुल लागत (रु.)	MC(Rs.) सीमांत लागत (रु.)
1	20	----	----
2	15	----	----
3	20	_----	_----

31 Discuss the concept of 'Price Ceiling' with the help of diagram. 4

'मूल्य सीमा' की संकल्पना को आरेख की सहायता से समझाएँ।

32 Distinguish between positive economics and normative economics. Give an example of each. 4

सकारात्मक अर्थशास्त्र तथा मानकीय अर्थशास्त्र के बीच अंतर स्पष्ट कीजिए। दोनों का एक एक उदाहरण भी दें।

OR अथवा

Discuss the two aspects of the central problem of 'What to produce '.

'क्या उत्पादन क्या जाए' की केन्द्रीय समस्या के दोनों पहलुओं को समझाइए।

33 Explain the 'Law of Variable Proportion' with the help of a numerical schedule and diagram. 6

'परिवर्ती अनुपात के नियम' को एक संख्यात्मक अनुसूची एवं आरेख की सहायता से समझाएँ।

34 Explain Consumer's Equilibrium in case of two commodities using the Cardinal utility approach giving a schedule & diagram. 6

दो वस्तुओं के संदर्भ में गणनवाचक उपयोगिता विश्लेषण द्वारा उपभोक्ता संतुलन को एक अनुसूची तथा आरेख की सहायता से समझाएँ।

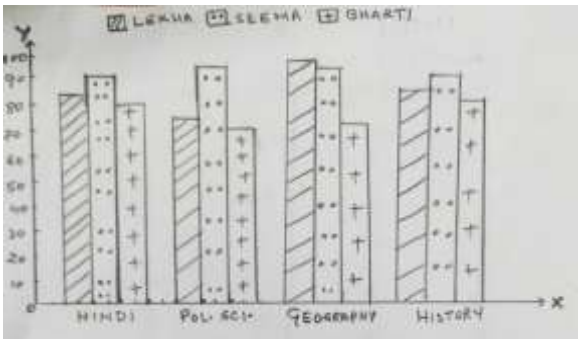
OR अथवा

Explain Consumer's Equilibrium using the Indifference curve approach with the help of a diagram.

अनधिमान वक्र के दृष्टिकोण का प्रयोग करते हुए एक आरेख की सहायता से उपभोक्ता संतुलन को समझाएँ।

SQP MARKING SCHEME (SESSION ENDING EXAMINATION 2022-23)

CLASS XI BJECT: ECONOMICS

Q.No.	EXPECTED ANSWERS	MM
1.	d	1
	b **OR** c	1
2.		
3.	a	1
4.	a	1
5.	Centrally located value of a series such that half of the values of the series are above it and the other half below it.	1
6.	b	1
7.	c	1
8.	b	1
9.	Prices	1
10.	d	1
11.	Rs. 29.47 ; Assumed Mean method formula is : $\bar{x} = A + \sum fd / \sum f$ **OR** Rs. 122.5 ; Step-deviation method formula is: $\bar{x} = A + \sum fd / \sum f \times C$	1 mark forformula. 2 marks for calculations.
12.	 Alternatively, students' name maybe shown on X-axis & Subjects on Y-axis.	3
13.		1

Class-interval	Frequency	Cumulative Frequency
9.5- 19.5	12	12
19.5- 29.5	19	31
29.5- 39.5	20	51
39.5- 49.5	21	72
49.5- 59.5	15	87
59.5- 69.5	13	100

M= size of N/2th item = 100/2= size of 50th item. ½

Hence Median lies in the class 29.5-39.5

$\mathbf{M = l_1 + \frac{N/2 - c.f}{f} \times i}$ 1

$M = 29.5 + \frac{50 - 31}{20} \times 10 = 39.$ 1½

OR

Mid-value	Class-interval	Frequency
15	10-20	5
25	20-30	8 (f_0)
35	30-40	15 (**f_1**)
45	40-50	4 (f_2)
55	50-60	6
65	60-70	7

½

Modal class interval is 30-40 since it has the highest frequency. ½

$$Z = l_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i$$ 1

$$Z = 30 + \frac{15-8}{2(15)-8-4} \times 10 = 33.8$$ 2

14.

X	Deviation ($x = X-\bar{X}$)	Square of Deviation (x^2)	Y	Deviation ($y = Y-\bar{Y}$)	Square of Deviation (y^2)	Multiple of Deviations ($x.y$)
2	-1.5	2.25	4	0	0	0
3	-0.5	0.25	5	1	1	-0.5
1	-2.5	6.25	3	-1	1	2.5
5	1.5	2.25	4	0	0	0
6	2.5	6.25	6	2	4	5
4	0.5	0.25	2	-2	4	-1
$\sum X=21$ N=6 $\bar{X}=3.5$	$\sum x=0$	$\sum x^2=17.5$	$\sum Y=24$ N=6 $\bar{Y}=4$	$\sum y=0$	$\sum y^2=10$	$\sum xy=6$

2

1

1

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \times \sum y^2}}$$

R = + 0.45 ; Low degree of Positive Correlation between X & Y.

15.

a) Selection of base year is a problem in the construction of index numbers. Base Year is the reference year. It is the year with which prices of the current year are compared. As far as possible, Base Year should be a normal year. This means the Base Year should be one without serious fluctuations in the economy. Otherwise, the index values would fail to capture the real change in the variable.

2

b) The problem of Selection of Goods and Services is to be addressed while constructing index numbers. For example, while constructing CPI it is neither possible nor desirable to include all the goods and services produced in the country. We have to choose those goods and services which represent most of others in the market. Larger the number of goods and services more representative is the index number. 2

16. Classification is the grouping of related facts into different classes. Thus, the process by which data is divided into different classes on the basis of their similarity or diversity is called Classification of Data. 1

Qualitative Classification: When the data is classified according to the qualities or attributes of data, it is called qualitative classification. Qualitative classification maybe of two types: 2

a) Simple Classification: the data are divided on the basis of existence or absence of a quality.
b) Manifold Classification: the quality of data involves more than one characteristic. ½

Example: Data classified on the basis of Education, Occupation, Religion etc.

Quantitative Classification: Quantitative or numerical classification is done on the basis of numerical values of the facts. A number of classes are framed keeping in view the lowest and highest value as well as the range of values in the data. Quantitative Classification is also called Classification by Variables. 2 ½

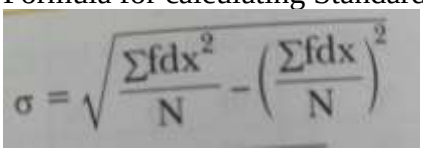
Example: Data classified on the basis of profit levels, wages earned, marks secured etc.

17.

Age	No. of workers (f)	Mid-value (m)	Deviation from Assumed Mean (dx=m-A) A=37.5	Square of deviations (dx^2)	f. dx	f. dx^2
20-25	17	22.5	-15	225	-255	3825
25-30	11	27.5	-10	100	-110	1100
30-35	8	32.5	-5	25	-40	200
35-40	5	37.5	0	0	0	0
40-45	4	42.5	5	25	20	100
45-50	3	47.5	10	100	30	300
50-55	2	52.5	15	225	30	450
	N=50		$\sum dx=0$	$\sum dx^2=700$	$\sum f.dx=-325$	f. $dx^2=5975$

3

Formula for calculating Standard Deviation using Assumed Mean method: 1



2

Standard deviation = 8.78

18. c 1
19. 3 units because the consumer maximises his satisfaction when $MU_X=P_X$ 1
20. Demand for flowers is more elastic because with 1% fall in price of flowers, it's demand rises by 0.9%. In case of toys the elasticity is comparatively less because with 1% fall in price of toys, its demand rises by only 0.5%. The negative sign only indicates the inverse relation between Price & Demand. 1(no marks if reason is not given)

OR

a 1

21. d 1
22. a 1
23. d 1

24. Due to homogeneous product being sold at a given price, the requirement of sales promotion/advertising is ruled out. Hence no selling costs are incurred under Perfect Competition. — 1

25. b — 1

26. False. Contraction of supply occurs due to change in price of the given commodity. Decrease of supply occurs due to change in factors other than price of the given commodity — 1(no marks if reason is not given)

27. c — 1

28.

Price(Rs.)	Total Expenditure(Rs.)	Quantity (Expenditure/Price)
7	84	12
6	72	12

1

P_{ed} = % change in quantity demanded / % change in Price — ½

Original Quantity(Q) = 12 units ; New Quantity(Q_1) = 12 units ; $\Delta Q = 0$

Original Price(P) = Rs. 7 ; New Quantity(P_1) = Rs. 6 ; $\Delta P = -1$

% change in Demand = $\Delta Q / Q \times 100 = 0/12 \times 100 = 0$ — 1 ½

Since Zero divided by any number is equal to Zero, hence, $P_{ed} = 0$

29. Both AR and MR curves slope downwards in Monopoly as well as Monopolistic Competition. However, the difference is in the elasticity of the revenue curves. Under Monopoly, the revenue curves have lower degree of elasticity of demand because there are no close substitutes of the monopoly product in the market. However, in case of Monopolistic Competition, the revenue curves are more elastic. This is because there are a large number of close substitutes of the firm's product in the market. — 3

OR

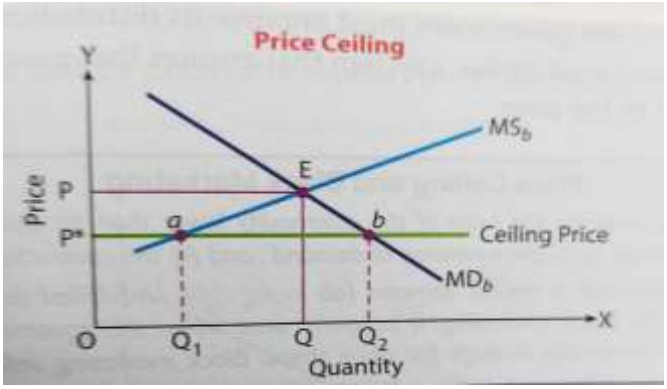
Price discrimination is a feature of monopoly market. It refers to the practice by a seller of charging different prices from different buyers for the same good. Since there are no close substitutes of the monopoly product, a monopolist has complete control over price and hence can practice Price discrimination. On the other hand, Product Differentiation is a distinct feature of Monopolistic Competition. It implies that rival firms are selling products which are not perfect substitutes but close substitutes of each other. — 3

30.

Output	AVC	**TVC**	**TFC**	**TC(Rs)**	**MC(Rs.)**
1	20	20	60	80	20
2	15	30	60	90	10
3	20	60	60	120	30

1 mark for each calculated column (1x4=04)

31. Price Ceiling means maximum price of a commodity that the sellers can charge from the buyers. This price is often fixed at a lower level then the equilibrium market price in order that the poorer sections of the society can afford to buy it. — ½



1 ½

2

Equilibrium Price = OP ; Equilibrium Quantity = OQ ; Ceiling Price = OP* ; Excess Demand = ab = Q_1Q_2

MD_b is the demand curve and MS_b is the supply curve of the commodity. E indicates the point of market equilibrium. OP is the equilibrium price and OQ is the equilibrium quantity. The government fixes the price ceiling at OP^* in order to enable the poorer sections to purchase the commodity. OP^* is at a lower level than the equilibrium price OP. Ceiling price is likely to impact the market supply and market demand. When price reduces from OP to OP^* demand for the good extends from OQ to OQ_2. On the other hand, supply contracts from OQ to OQ_1. Thus, a gap between market demand and market supply is generated. This is a situation when demand is greater than supply or in other words a situation of Excess Demand.

32. Positive economics deals with those statements of economic behaviour, relating to "what was", "what is" and "what would be". These statements may be true or false. Positive economics does not involve value judgement and these statements are verifiable. 1 ½

For example, "China has the largest population in the world" or "India has the largest population in the world". Both statements relate to Positive economics. ½
While the first statement is true, the second statement is false.

On the other hand, Normative economics relates to economic problems dealing with "what ought to be". These statements can not to be termed as true or false because they involve opinions. Normative statements cannot be verified and they involve value judgments. 1 ½

For example, "No subsidies should be given in the agricultural sector in India". ½
This statement is open to be discussed for different opinions.

OR

The central problem of 'what to produce' arises due to the fact that means are scarce in relation to their wants. This problem has two dimensions:

(a) What to produce: The economy has to decide whether Consumer goods are to be produced or Capital goods are to be produced. Similarly, choice has to be made between the production of Wartime goods and Peace time goods.

(b) How much to produce: Every economy has to decide how much of Consumer goods and how much of Capital goods are to be produced. If an economy decides to produce more of one commodity using a given technology & given resources, (2+2)

then it will have to produce less of the other commodity.

33. Law of variable proportion is one of the most important laws of production. It states that as we increase the quantity of only one input keeping other inputs fixed the total product initially increases at an increasing rate, then at a decreasing rate and finally at a negative rate.

Assumptions:

1. it operates in the short run.
2. different units of variable factor can be combined with fixed factor.
3. factors of production become imperfect substitutes of each other beyond a certain Limit.
4. state of technology is assumed to be constant during the operation of this law.
5. all variable factors are equally efficient.

Fixed Factor (Land in acres)	Variable Factor (Labour)	TP (units)	MP (units)	Phase
1	1	10	10	Phase I: Increasing Returns to a Factor
1	2	30	20	
1	3	45	15	Phase II: Diminishing Returns to a Factor
1	4	52	7	
1	5	52	0	
1	6	48	-4	Phase III: Negative Returns to a Factor

3

There are 3 phases under the Law of Variable Proportion:

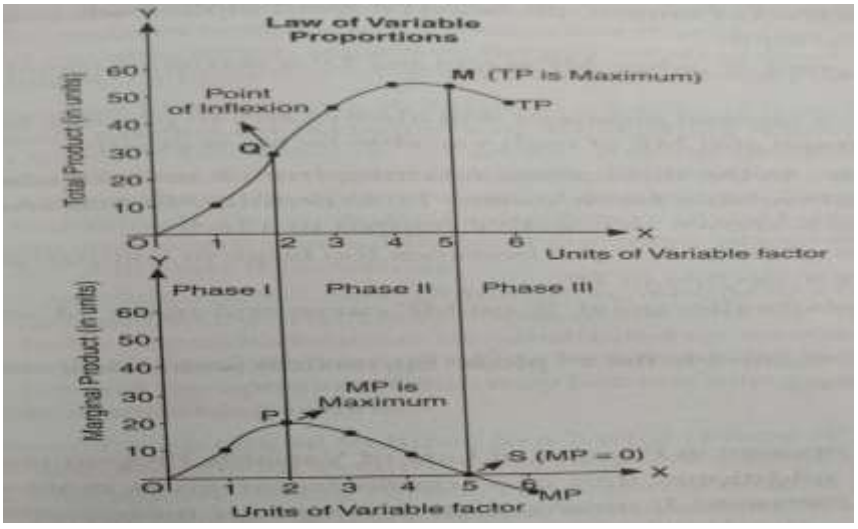
Phase I- Between O to Q where TP increases at an increasing rate and MP also increases from O to P.

Phase 2- Between Q to M, TP increases at a decreasing rate and MP falls from P to S.

This phase ends when MP becomes zero and TP reaches its maximum point.

Phase 3- Beyond point M, TP starts decreasing and MP becomes negative.

Point Q in the diagram is known as the 'Point of Inflection' as the curvature of TP curve changes, at this point, from increasing rate to diminishing rate.



3

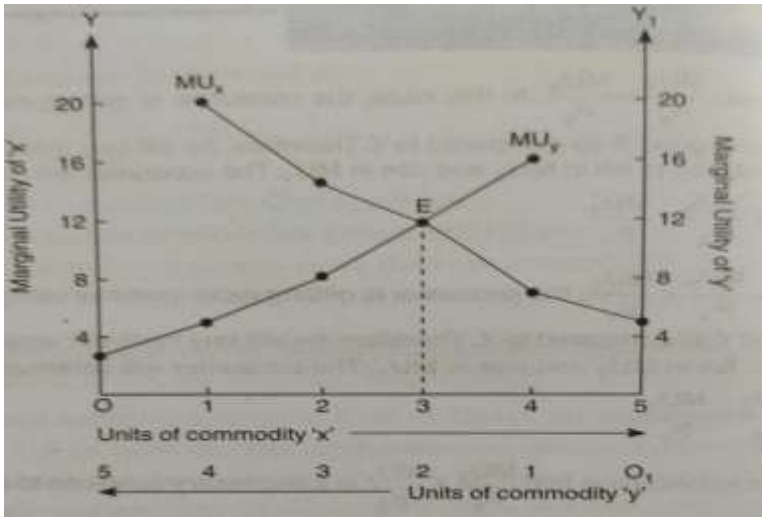
34. Consumer's equilibrium in case of 2 commodities using the cardinal utility approach is also known as the 'Law of Equi-Marginal Utility'. It is based on the Law of DMU. There are 2 necessary conditions to attain consumer's equilibrium in case of two commodities:

1. The ratio of Marginal utility to Price is same in case of both the goods i.e. **($MU_X/P_X=MU_Y/P_Y=MU_M$).**
2. Marginal utility falls as consumption increases.

In the given table, total money income of the consumer is assumed to be ₹5 which he wishes to spend on two goods X and Y. Both these goods are priced at ₹1 per unit. Hence consumer can buy maximum 5 units of good X or 5 units of good Y. The marginal utility which the consumer derives from various units of X & Y are shown in the table.

Units	MU of commodity 'x' (in utils)	MU of commodity 'y' (in utils)
1	20	16
2	14	12
3	12	8
4	7	5
5	5	3

3



In the diagram MU from commodity X is taken on OY axis and MU from commodity Y is taken on O_1Y_1 axis. MU_X & MU_Y are the MU curves for goods X & Y respectively. To reach equilibrium the consumer must fulfil both the necessary
conditions which happens at point E when the consumer buys 3 units of X and 2 units of Y. This is because:

a) MU from the 5th rupee spent on good Y gives the same satisfaction of 12 utils as given by 4th rupee spent on good X.
b) MU of each good falls as consumption increases.

If the consumer spends his income in any other order total satisfaction will be less than 74 utils which the consumer will obtain while buying 3 units of X and 2 units of Y. 3

OR

The indifference curve analysis determines consumer's equilibrium, that is, the point of maximum satisfaction by studying indifference map and budget line together. The consumer's equilibrium under this theory must fulfil the following two conditions:

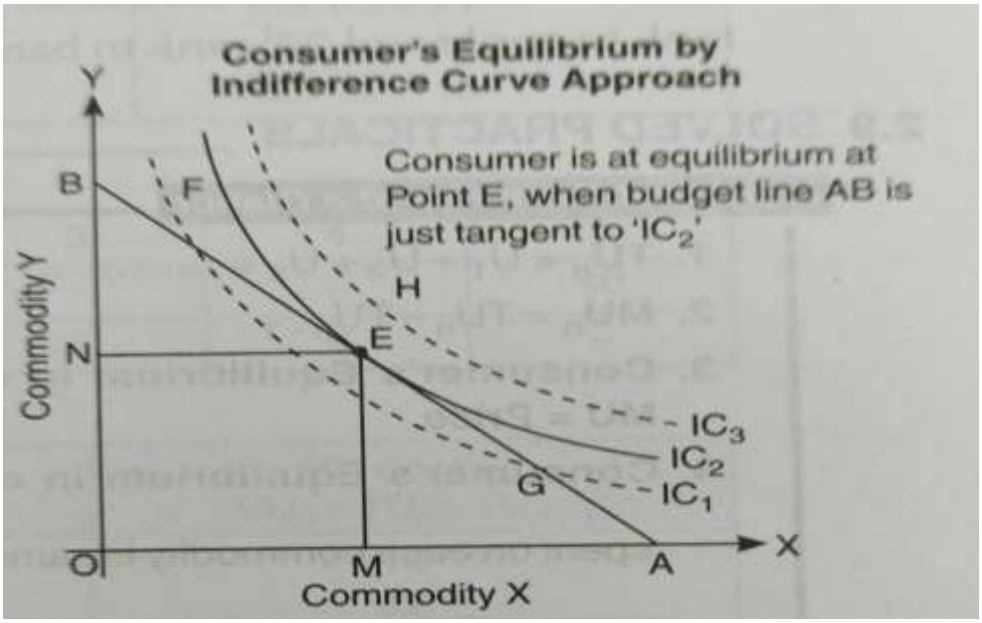
i) $MRS_{XY} = P_X / P_Y$ (ratio of prices).

If $MRS_{XY} > P_X / P_Y$, it means that to obtain one more unit of X the consumer is willing to sacrifice more units of Y as compared to what is required in the market. It induces the consumer to buy more of X. As a result, MRS falls and continues to fall till it becomes equal to the ratio of prices and the equilibrium is established.

If $MRS_{XY} < P_X / P_Y$, it means that to obtain one more unit of X the consumer is willing to sacrifice less units of y as compared to what is required in the market. It induces the consumer to buy less of X and more of Y. As a result, MRS rises till it becomes equal to the ratio of prices and the equilibrium is established.

ii) MRS continuously falls MRS must be diminishing at the point of equilibrium, that is, the indifference curve must be convex to the origin at the point of equilibrium.

3



In the above diagram, IC_1, IC_2 & IC_3 are the three Indifference curves. AB is the budget line. Given the constraint of a budget line, the highest IC which a consumer can reach is IC_2. The budget line is tangent to IC_2 at point E. This is the point of Consumer Equilibrium where the consumer purchases OM quantity of good X and ON quantity of good Y. All other points on the budget line will indicate a lower level of satisfaction.

The second condition is also satisfied at point E as MRS is diminishing at point E, i.e., IC_2 is convex to the origin at point E.
A budget line can be tangent to only one indifference curve, consumer maximises his satisfaction at point E when both the conditions are satisfied.

3

SAMPLE QUESTION PAPER (2022-23)
प्रतिदर्श प्रश्न पत्र (2022-23)
ECONOMICS (030) CLASS XI
अर्थशास्त्र (030) कक्षा XI

TIME: 3HOURS M.M.-80
समय: 3 घंटे पूर्णांक-80

GENERAL INSTRUCTIONS:

1. This question paper contains two sections;
   Section A - Statistics for Economics
   Section B - Introductory Micro Economics
2. This paper contains 20 Multiple Choice Questions type questions of 1 mark each.
3. This paper contains 4 Short Answer Questions type questions of 3 marks each to be answered in 60 to 80 words.
4. This paper contains 6 Short Answer Questions type questions of 4 marks each to be answered in 80 to 100 words.
5. This paper contains 4 Long Answer Questions type questions of 6 mark each to be answered in 100 to 150 words.

सामान्य निर्देश:

1. इस प्रश्न पत्र में दो खंड हैं;
   खंड ए - अर्थशास्त्र के लिए सांख्यिकी
   खंड बी - परिचयात्मक सूक्ष्म अर्थशास्त्र
2. इस प्रश्न-पत्र में 20 बहुविकल्पीय प्रश्न हैं, जिनमें से प्रत्येक 1 अंक का है।
3. इस प्रश्न-पत्र में 4 लघु उत्तरीय प्रश्न हैं, जिनमें से प्रत्येक के 3 अंक हैं, जिनका उत्तर 60 से 80 शब्दों में देना है।
4. इस प्रश्न-पत्र में 6 लघु उत्तरीय प्रश्न हैं, जिनमें से प्रत्येक के 4 अंक हैं, जिनका उत्तर 80 से 100 शब्दों में देना है।
5. इस प्रश्न-पत्र में 6 अंकों के 4 दीर्घ उत्तरीय प्रश्न हैं जिनका उत्तर 100 से 150 शब्दों में देना है।

Q.NO प्रश्न	SECTION A - STATISTICS FOR ECONOMICS खंड ए - अर्थशास्त्र के लिए सांख्यिकी	MM अंक
1	Statistics can be considered as ; a) A science b) an art c) both (a)and(b) d) neither a science nor an art सांख्यिकी को ..... के रूप में माना जा सकता है; a) एक विज्ञान b) एक कला c) दोनों (a) और (b) d) न तो विज्ञान और न ही कला	1
2	First-hand information data are called. a) Primary data b) secondary data c) both (a)and(b) d) None of the above प्रत्यक्ष रूप से एकत्र किए गए आंकड़े कहलाते हैं a) प्राथमिक आंकड़े b) द्वितीयक आंकड़े c) दोनों d) इनमें से कोई नहीं	1
3	Classification is the process of arranging data in . a) Different rows b) Different columns c) Groups of related data in different classes d) Different rows and columns. वर्गीकरण डेटा को …….. में व्यवस्थित करने की प्रक्रिया है। a) अलग-अलग पंक्तियाँ b) अलग-अलग कॉलम c) संबंधित डेटा के विभिन्न वर्गों के समूह d) विभिन्न पंक्तियाँ और स्तंभ।	1

4 Which of the following statements is not an example of statistics. 1

a) Birth rate in India is 18 per thousand as compared to 8000 in the US.
b) Ramesh has a rupees hundred note in his pocket.
c) Over the last 10 years India has won 60 test matches in cricket and lost 50.
d) Average pocket allowance of the students of class 11 is 500 per month

निम्नलिखित में से कौन सा कथन सांख्यिकी का उदाहरण नहीं है।

a. अमेरिका में 8000 की तुलना में भारत में जन्म दर 18 प्रति हजार है।
b. रमेश की जेब में सौ रुपये का नोट है।
c. पिछले 10 वर्षों में भारत ने क्रिकेट में 60 टेस्ट मैच जीते हैं और 50 हारे हैं।
d. कक्षा 11 के छात्रों का औसत पॉकेट भत्ता 500 प्रति माह है।

5 Diagrammatic representation of the cumulative frequency distribution is; 1

a) Frequency polygon b) Histogram c) Ogive d) All of these

संचयी बारंबारता बंटन का आरेखीय निरूपण है;

a) बारंबारता बहुभुज b) हिस्टोग्राम c) तोरण d) ये सभी

6 Consumer price index is also known as 1

a) Family budget b) cost of living index
c) whole sale price index d) Industrial Production index

उपभोक्ता मूल्य सूचकांक को ..... के रूप में भी जाना जाता है

a) परिवार का बजट b) जीवन निर्वाह सूचकांक की लागत
c) थोक बिक्री मूल्य सूचकांक d) औद्योगिक उत्पादन सूचकांक

7 Arithmetic mean of a series is affected by the ___ (lower/extreme) values of the series. 1

एक श्रृंखला का अंकगणितीय माध्य श्रृंखला के ___ (निचले/चरम) मानों से प्रभावित होता है

Read the following case study and answer the questions (8-10)

Correlation measures the linear relationship between the two variables. If r is 0, it implies the absence of correlation, i.e there is no linear relation between them, however, in such cases the variables may be non-linearly related. So, if two variables are not correlated, it does not necessarily follow that they are independent.

निम्नलिखित केस स्टडी को पढ़ें और 8 - 10 प्रश्नों के उत्तर दें

सहसंबंध दो चरों के बीच रैखिक संबंध को मापता है। यदि r शून्य है, तो यह सहसंबंध की अनुपस्थिति को दर्शाता है, अर्थात उनके बीच कोई रैखिक संबंध नहीं है, हालांकि, ऐसे मामलों में चर गैर-रैखिक रूप से संबंधित हो सकते हैं। इसलिए यदि दो चर सहसंबंधित नहीं हैं, तो यह जरूरी नहीं है कि वे स्वतंत्र हैं।

8 Coefficient of correlation in case of perfect negative correlation is ____ 1

a) 1 b) -1 c) 0 d) all of the above

पूर्ण ऋणात्मक सहसंबंध के मामले में सहसंबंध का गुणांक _____ है

a) 1 b) -1 c) 0 d) उपरोक्त सभी

9 The correlation is said to be positive when two variables move in the ____ direction 1

a) Same b) opposite c) linear d) either (a) or (b)

सहसंबंध को सकारात्मक कहा जाता है जब दो चर _____ दिशा में चलते हैं

a) समान b) विपरीत c) रैखिक d) a या b)

10 _____ is a graphic presentation of correlation 1

a) Ogive b) Histogram c) Scatter diagram d) Both (a)and(c)

_____ सहसंबंध की एक ग्राफिक प्रस्तुति है

a) तोरण b) हिस्टोग्राम c) स्कैटर आरेख d) (a) और (c) दोनों

OR 1

अथवा

Read the following case study and answer the following questions:

"Mode is the value which has the greatest frequency density in its immediate neighbourhood"

The forgoing, discussion reveals two concepts of mode;

I) Mode is a value which repeats the highest number of times in a statistical distribution.

II) Mode is the value around in which there is a greatest concentration of values. It is the second concept of mode which is more appropriate in statistical analysis. For a common man, it is the first concept which is more appropriate.

निम्नलिखित केस स्टडी को पढ़ें और निम्नलिखित प्रश्नों के उत्तर दें:

" बहुलक वह मान है जिसके निकटतम पड़ोस में आवृत्ति घनत्व सबसे अधिक होता है"

पूर्वगामी, चर्चा से बहुलक की दो अवधारणाओं का पता चलता है;

I. बहुलक एक ऐसा मान है जो सांख्यिकीय वितरण में सबसे अधिक बार दोहराता है।

II. बहुलक वह मान है जिसके चारों ओर मूल्यों का सर्वाधिक संकेंद्रण होता है। यह बहुलक की दूसरी अवधारणा है जो सांख्यिकीय विश्लेषण में अधिक उपयुक्त है। एक आम आदमी के लिए, पहली अवधारणा अधिक उपयुक्त है।

8 Mode of a series is;

a) An average value b) a middle value

c) a highest frequency value d) none of the above

एक श्रृंखला का बहुलक है;

a) एक औसत मूल्य b) एक मध्यम मूल्य

c) उच्चतम आवृत्ति मान d) उपरोक्त में से कोई नहीं

9. A grouping table has;

a) 4 columns b) 6 columns c) 8 columns d) none of these

एक समूहन तालिका है;

a) 4 कॉलम b) 6 कॉलम c) 8 कॉलम d) इनमें से कोई नहीं

10 If mode is ill defined then it is calculated with the help of formula;

a) Mode = 2 median – 3 mean
b) Mode = 2 median + 3 mean
c) Mode = 3 median + 3 mean
d) Mode = 3 median – 2 mean

यदि बहुलक को परिभाषित नहीं किया गया है तो इसकी गणना सूत्र की सहायता से की जाती है;

a) बहुलक = 2 माध्यिका - 3 माध्य

b) बहुलक = 2 माध्यिका + 3 माध्य

c) बहुलक = 3 माध्यिका + 3 माध्य

d) बहुलक = 3 माध्यिका - 2 माध्य

11. "The sum of deviations of items from arithmetic mean is always equal to zero" $\sum (X - \bar{X} = 0)$. Prove this statement with the help of numerical example.

"समांतर माध्य से मदों के विचलन का योग सदैव शून्य के बराबर होता है" ($\sum (X - \bar{X}) = 0$) संख्यात्मक उदाहरण की सहायता से इस कथन को सिद्ध कीजिए।

12 Why does rank correlation coefficient differ from Pearsonian correlation coefficient? 3

OR

Discuss the properties of correlation coefficient. (any three)

रैंक सहसंबंध गुणांक पियर्सोनियन सहसंबंध गुणांक से भिन्न क्यों है?

या

सहसंबंध गुणांक के गुणों की विवेचना कीजिए। (कोई तीन)

13 The following table shows the distribution of employment in rural areas in to self-employed, casual wage workers and Regular salaried employed. 4

Status of workers	Self-employed	Casual wage workers	Regular salaried employees
Percentage (%)	58	29	13

Represent the above data as pie diagram.

OR

The following table shows estimates (approximate) of distribution of work force (in percentage) by Industry for the years 2011-12 and 2016-2018.

Industrial category	Primary sector	Secondary sector	Tertiary sector
2011-12	49	24	27
2017-18	45	25	30

Represent the above data as Multiple bar diagram.

निम्न तालिका ग्रामीण क्षेत्रों में स्व-रोजगार, आकस्मिक वेतन श्रमिकों और नियमित वेतनभोगी कर्मचारियों में रोजगार के वितरण को दर्शाती है।

श्रमिकों की स्थिति	स्वनियोजित	आकस्मिक वेतन कर्मी	नियमित वेतनभोगी कर्मचारी
प्रतिशत (%)	58	29	13

उपरोक्त आँकड़ों को पाई आरेख के रूप में निरूपित करें।

या

निम्न तालिका वर्ष 2011-12 और 2016-2018 के लिए उद्योग द्वारा कार्य बल के वितरण (प्रतिशत में) के अनुमान (अनुमानित) को दर्शाती है।

औद्योगिक श्रेणी	प्राइमरी सेक्टर	माध्यमिक क्षेत्र	तृतीय श्रेणी का उद्योग
2011-12	49	24	27
2017-18	45	25	30

उपरोक्त आँकड़ों को बहु दंड आरेख के रूप में निरूपित करें।

14 The following table gives daily income of 100 workers in a factory. Find the arithmetic mean. 4

Daily Income (Rs)	0-50	50-100	100-150	150-200	200-250	250-300
No. of workers	10	5	20	30	25	10

निम्नलिखित तालिका एक कारखाने में 100 श्रमिकों की दैनिक आय दर्शाती है। अंकगणित माध्य ज्ञात कीजिए।

दैनिक आय (रु.)	0-50	50-100	100-150	150-200	200-250	250-300
श्रमिकों की संख्या	10	5	20	30	25	10

15 In a poetry recitation competition, 10 participants were accorded following marks by two different judges, X and Y: 4

X	15	17	14	13	11	12	16	18	10	9
Y	15	12	4	6	7	9	3	10	2	5

Calculate the coefficient of rank correlation.

एक कविता पाठ प्रतियोगिता में, दो अलग-अलग न्यायाधीशों, X और Y द्वारा 10 प्रतिभागियों को निम्नलिखित अंक दिए गए:

X	15	17	14	13	11	12	16	18	10	9
Y	15	12	4	6	7	9	3	10	2	5

रैंक सहसंबंध के गुणांक की गणना करें।

16 (a)"Sampling method provides better results than Census method" Do you agree with this statement. If so, give arguments in favour of your answer. 3+3 = 6

(b)Prepare a frequency distribution by inclusive method taking class interval of 6 from the following data:

5	8	12	17	34	25	35	12	10	20
4	3	29	27	33	36	1	29	12	32
23	24	27	31	10	11	13	15	2	7
14	18	24	30	36	7	21	13	6	9

(a) " नमूना पद्धति जनगणना पद्धति की तुलना में बेहतर परिणाम प्रदान करती है" क्या आप इस कथन से सहमत हैं। यदि हां, तो अपने उत्तर के पक्ष में तर्क दीजिए।

(b) निम्नलिखित आंकड़ों से 6 का वर्ग अंतराल लेकर समावेशी विधि द्वारा बारंबारता वितरण तैयार करें:

5	8	12	17	34	25	35	12	10	20
4	3	29	27	33	36	1	29	12	32
23	24	27	31	10	1 1	13	15	2	7
14	18	24	30	36	7	21	13	6	9

17 Examine the benefits of (a) Whole sale price index and (b) Consumer price index in Economics. 6

(a) थोक बिक्री मूल्य सूचकांक और (b) अर्थशास्त्र में उपभोक्ता मूल्य सूचकांक के लाभों की जांच करें।

PART – B MICROECONOMICS

18 From the statement given below, identify the statement which is **false**.

(a) Production possibility frontier is concave to the origin when the Marginal Rate of Transformation (MRT) Increases.

(b) An economy always produces on PPC, if resources are fully and efficiently utilized.

(c) Massive unemployment will shift the PPC to the right.

(d) PPC shift toward right when there is growth of resources.

नीचे दिए गए कथन से उस कथन की पहचान कीजिए जो **असत्य** है।

(a) परिवर्तन की सीमांत दर (एमआरटी) बढ़ने पर उत्पादन संभावना सीमा मूल के लिए अवतल होती है।

(b) एक अर्थव्यवस्था हमेशा पीपीसी पर उत्पादन करती है, अगर संसाधनों का पूरी तरह और कुशलता से उपयोग किया जाता है।

(c) भारी बेरोजगारी पीपीसी को दाईं ओर स्थानांतरित कर देगी।

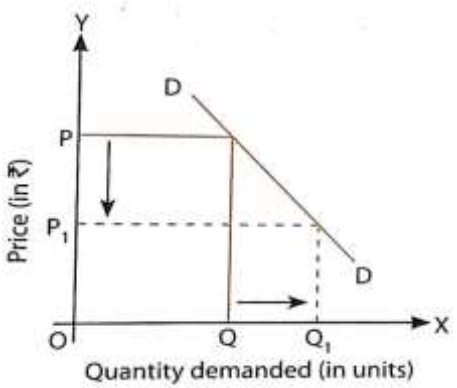
(d) संसाधनों की वृद्धि होने पर पीपीसी दाईं ओर शिफ्ट हो जाती है।

19 **State whether the following statement is true or false**: 1

A consumer consumes only two goods X and Y. Marginal utilities of Good X and Y are 4 and 5 respectively. Price of good X and Y is Rs. 2 per unit and the consumer is in equilibrium.

OR

Read the diagram given below and find that it belongs to which type of elasticity of demand? (Choose the correct alternative)



(a) Elastic demand (Ed › 1) (b) Inelastic demand (Ed < 1)

(c) Perfectly elastic demand(Ed = ∞) (d) Unitary elastic demand (Ed = 1)

बताएं कि निम्नलिखित कथन सही है या गलत :

एक उपभोक्ता केवल दो वस्तुओं X और Y का उपभोग करता है। वस्तु X और Y की सीमांत उपयोगिताएँ क्रमशः 4 और 5 हैं। अच्छे X और Y की कीमत रु। 2 प्रति यूनिट और उपभोक्ता संतुलन में है।

या

नीचे दिए गए आरेख को पढ़िए और ज्ञात कीजिए कि यह मांग की किस प्रकार की लोच से संबंधित है? (सही विकल्प का चयन करें)

(a) लोचदार मांग (Ed › 1) (b) लोचदार मांग (Ed <1)

(c)पूरी तरह से लोचदार मांग (Ed=∞) (d) एकात्मक लोचदार मांग (Ed=1)

20 **Read the following statements and choose the correct alternatives given below:** 1

Statement 1. Substitute goods are those goods if the rise in price of Good X causes rise in demand for Good Y**.**

Statement 2: The demand for a Complimentary good rise if the price of other complimentary good rises.

Alternatives:

(a) Both the statements are true.

(b) Both the statements are false

(c) Statement 1 is true and statement 2 is false.

(d) Statement 2 is true and statement 1 is false.

निम्नलिखित कथनों को पढ़िए और नीचे दिए गए विकल्पों में से सही विकल्प चुनिए: 1

कथन 1 : स्थानापन्न वस्तुएँ वे वस्तुएँ हैं यदि वस्तु X की कीमत में वृद्धि के कारण वस्तु Y की माँग में वृद्धि होती है।

कथन 2 : यदि एक पूरक वस्तु की कीमत बढ़ती है तो अन्य पूरक वस्तु की मांग में वृद्धि होती है।

विकल्प :

(a) दोनों कथन सत्य हैं।

(b) दोनों कथन गलत हैं

(c) कथन 1 सत्य है और कथन 2 गलत है।

(d) कथन 2 सत्य है और कथन 1 गलत है।

21 Which of the following causes upward movement along the demand curve. 1

(a) Expansion of demand (b) Contraction of demand

(c) Increase in demand (d) Decrease in demand

निम्नलिखित में से किस कारण से मांग वक्र ऊपर की ओर गति करता है ।

(a) मांग का विस्तार (b) मांग का संकुचन

(c) मांग में वृद्धि (d) मांग में कमी

22 Read the following statements and choose the correct alternatives given below: 1

Assertion (A) Indifference curve is convex to the origin.

Reason (R) Due rise in Marginal rate of substitution (MRS)

(a) Both assertion(A) and reason (R) are true, and reason (R) is the correct explanation of assertion(A)

(b) Both assertion(A) and reason(R) are true, but reason(R) is not the correct explanation of assertion(A).

(c) Assertion(A) is true but reason (R) is false

(d) Both assertion(A) and reason (R) are false.

निम्नलिखित कथनों को पढ़िए और नीचे दिए गए विकल्पों में से सही विकल्प चुनिए: 1

अभिकथन (A) उदासीनता वक्र मूल के उत्तल है।

कारण (B) प्रतिस्थापन की सीमांत दर में वृद्धि (एमआरएस)

(a) अभिकथन (A) और कारण (R) दोनों सत्य हैं, और कारण (R) अभिकथन (A) की सही व्याख्या है।

(b) कथन (A) और कारण (R) दोनों सत्य हैं, लेकिन कारण (R) अभिकथन (A) की सही व्याख्या नहीं है।

(c) अभिकथन (A) सही है लेकिन कारण (R) गलत है

(d) अभिकथन (A) और कारण (R) दोनों गलत हैं।

23 **Identify and match the sequence of alternatives given in Column I with their respective functions in Column II** 1

Column I		**Column** II	
A	Normal goods	(i)	To increase the consumption of one good we have to decrease the consumption of other good.
B	Inferior goods	(ii)	P1X1 + P1X2 = M
C	Budget line is straight line	(iii)	Demand decreases when income of the household increases assuming price constant.
D	Budget line slopes downwards	(iv)	Demand increases when income of the household increases assuming price constant.

कॉलम I में दिए गए विकल्पों के अनुक्रम को पहचानें और कॉलम II में उनके संबंधित कार्यों के साथ मिलान करें

कॉलम I		**कॉलम** II	
A	सामान्य सामान	(i)	एक वस्तु की खपत बढ़ाने के लिए हमें दूसरी वस्तु की खपत कम करनी होगी।
B	सस्ता माल	(ii)	P1X1 + P1X2 = M
C	बजट रेखा सीधी रेखा होती है	(iii)	कीमत स्थिर मानकर परिवार की आय बढ़ने पर मांग घट जाती है।
D	बजट रेखा नीचे की ओर ढलती है	(iv)	कीमत स्थिर मानकर परिवार की आय बढ़ने पर मांग बढ़ जाती है।

(a) A-(iii), B-(i), C-(ii), D-(iv) (b) A-(iv), B-(ii), C-(iii), D-(i)

(c) A-(iii), B-(i), C-(iv), D-(ii) (d) A-(iv), B-(iii), C-(ii), D-(i)

24 From the given statement identify the false statement: 1

(a) AR curve is inverse U-shaped curve. (b) TC curve is S shaped curve.

(c) AVC declines as the output increases. (d) TFC first rises then falls.

दिए गए कथन से असत्य कथन की पहचान करें:

(a) एआर वक्र उलटा यू-आकार का वक्र है।

(b) टीसी वक्र एस आकार का वक्र है।

(c) आउटपुट बढ़ने पर एवीसी घट जाती है।

(d) टीएफसी पहले उगता है फिर गिरता है।

25 **Find the missing values from the following:** 1

Output (Units)	Average Variable Cost (AVC) (Rs)	Total Cost (Rs)	Marginal cost (Rs)
1	-----	60	20
2	18	-----	16

निम्नलिखित में से लुप्त मान ज्ञात कीजिए:

उत्पादन (इकाइयां)	औसत परिवर्तनीय लागत (एवीसी) (रु.)	कुल लागत (रु.)	सीमांत लागत (रु.)
1	-----	60	20
2	18	-----	16

a) 60, 78 (b) 20, 96 (c) 20, 76 (d) 60, 76

OR

"The GST rates were hiked on several items at the 47th Council Meet, chaired by Union Finance Minister Nirmala Sitharaman last month in Chandigarh"

Business standard Dated July,18th,2022.

Identify the most likely impact on the supply of goods whose GST rates were increased from the following:

(a) Increase (b) decrease (c) Only (a) (d) Both (a) and (b)

"पिछले महीने चंडीगढ़ में केंद्रीय वित्त मंत्री निर्मला सीतारमण की अध्यक्षता में 47 वीं परिषद की बैठक में कई वस्तुओं पर जीएसटी दरों में बढ़ोतरी की गई थी" - बिजनेस स्टैंडर्ड दिनांक 18 जुलाई , 2022।

उन वस्तुओं की आपूर्ति पर सबसे संभावित प्रभाव की पहचान करें जिनकी जीएसटी दरों में निम्नलिखित से वृद्धि की गई थी:

(a) वृद्धि (b) कमी (c) केवल (a) (d) दोनों (a) और (b)

Read the following text and answer the questions 26 & 27

It is not very uncommon to come across instances where government fixes a maximum allowable price for certain goods. The government-imposed upper limit on the price of a good or service is called price ceiling. Price ceiling is generally imposed on necessary items like wheat, rice, kerosene, sugar.

For certain goods and services, fall in price below a particular level is not desirable and hence the government sets floors or minimum prices for these goods and services. The government imposed lower limit on the price that may be charged for a particular good or service is called price floor.

निम्नलिखित को पढ़िए और 26 और 27 के प्रश्नों के उत्तर दीजिए।

ऐसे उदाहरणों का आना बहुत असामान्य नहीं है जहां सरकार कुछ वस्तुओं के लिए अधिकतम स्वीकार्य मूल्य तय करती है। किसी वस्तु या सेवा की कीमत पर सरकार द्वारा लगाई गई ऊपरी सीमा को मूल्य सीमा कहा जाता है। मूल्य सीमा आमतौर पर गेहूं, चावल, मिट्टी के तेल, चीनी जैसी आवश्यक वस्तुओं पर लगाई जाती है।

कुछ वस्तुओं और सेवाओं के लिए, एक विशेष स्तर से नीचे कीमत में गिरावट वांछनीय नहीं है और इसलिए सरकार इन वस्तुओं और सेवाओं के लिए न्यूनतम या न्यूनतम मूल्य निर्धारित करती है। सरकार ने उस कीमत पर निचली सीमा लगाई जो किसी विशेष वस्तु या सेवा के लिए ली जा सकती है, जिसे मूल्य मंजिल कहा जाता है।

26 The price ceiling is _____ (Choose the correct alternative) 1

(a) Above the equilibrium price (b) Below the equilibrium price.

(c) Equilibrium price (d) Both (a) and (b)

मूल्य सीमा _____ है (सही विकल्प चुनें)

(a) संतुलन कीमत से ऊपर (b) संतुलन कीमत के नीचे।

(c) संतुलन मूल्य (d) दोनों (a) और (b)

27 Most well-known examples of imposition of price floor is/are _____ 1
(Choose the correct alternative)

(a) Maximum Support Price (b) Minimum Support Price

(c) Minimum wage legislation (d) Both (b) and (c)

निम्नतम निर्धारित कीमत लगाने के सबसे प्रसिद्ध उदाहरण _____

हैं (सही विकल्पचुनें)

(a) अधिकतम समर्थन मूल्य (b) न्यूनतम समर्थन मूल्य

(c) न्यूनतम मजदूरी कानून (d) दोनों (बी) और (सी)

28 Why does an economic problem arise? Explain the problem of "How to produce?" 3

आर्थिक समस्या क्यों उत्पन्न होती है? "उत्पादन कैसे करें?" की समस्या की व्याख्या करें।

29 Analyse the effect of the following on the supply of the commodity: 3

(a) Technological change (b) Increase in price of inputs

OR

Explain the relationship between total cost, total fixed cost and total variable cost with the help of a diagram.

वस्तु की आपूर्ति पर निम्नलिखित के प्रभाव का विश्लेषण करें :

(b) तकनीकी परिवर्तन (b) इनपुट की कीमत में वृद्धि

या

चित्र की सहायता से कुल लागत, कुल स्थिर लागत और कुल परिवर्तनीय लागत के बीच संबंध को स्पष्ट कीजिए

30 A consumer consumes only two goods X and Y whose prices are Rs.4 and Rs.5 per unit respectively. If the consumer uses a combination of two goods with marginal utility of X equals to 5 and of Y equal to 4. Is the consumer in equilibrium? What will the reactions of the rational consumer? Explain. 4

एक उपभोक्ता केवल दो वस्तुओं X और Y का उपभोग करता है जिनकी कीमत क्रमशः 4 रुपये और 5 रुपये प्रति यूनिट है। यदि उपभोक्ता X की सीमांत उपयोगिता 5 के बराबर और Y की 4 के बराबर दो वस्तुओं के संयोजन का उपयोग करता है। क्या उपभोक्ता संतुलन में है? तर्कसंगत उपभोक्ता की प्रतिक्रियाएँ क्या होंगी? समझाना।

31 A consumer buys 50 units of commodity at a price of ₹10 per unit. Find the new quantity of commodity using percentage method if price increase to ₹ 12 per unit. The elasticity of demand is equal to (-)1.5. 4

एक उपभोक्ता वस्तु की 50 इकाई ₹10 प्रति इकाई की कीमत पर खरीदता है। प्रतिशत विधि का उपयोग करके वस्तु की नई मात्रा ज्ञात कीजिए, यदि कीमत ₹ 12 प्रति इकाई तक बढ़ जाती है। मांग की लोच (-)1.5 के बराबर है।

32 Explain the implications of the following in a perfect competition; 4

(a) Large number of buyers (b) Freedom of entry and exit to firms.

OR

Market for a good is in equilibrium. The demand for the good increases. Explain the chain effects of the change.

एक पूर्ण प्रतियोगिता में निम्नलिखित के निहितार्थों की व्याख्या कीजिए;

(a) खरीदारों की बड़ी संख्या (b) फर्मों के प्रवेश और निकास की स्वतंत्रता।

या

एक अच्छे के लिए बाजार संतुलन में है। वस्तु की मांग बढ़ जाती है। इस परिवर्तन के श्रृंखला प्रभावों की व्याख्या करें।

33 What is indifference curve? Explain consumer's equilibrium under the indifference curve approach with diagram? 2+4

उदासीनता वक्र क्या है? उदासीनता वक्र उपागम के अंतर्गत उपभोक्ता के संतुलन को चित्र सहित समझाइए ?

34 Explain the law of variable proportions through the behavior of total product and marginal product. In which stage, a rational producer stops the production and why? 4+2

OR

Explain the marginal cost and marginal revenue approach for producer's equilibrium with the help of schedule and diagram.

कुल उत्पाद और सीमांत उत्पाद के व्यवहार के माध्यम से परिवर्तनशील अनुपात के नियम की व्याख्या करें। एक विवेकशील उत्पादक किस अवस्था में उत्पादन रोक देता है और क्यों?

या

अनुसूची और आरेख की सहायता से उत्पादक के संतुलन के लिए सीमांत लागत और सीमांत राजस्व दृष्टिकोण की व्याख्या करें।