आज़ादी का अमृत महोत्सव

Student Study Material
Term -2 (2021-2022)
Class- XI
Economics

स्वच्छ भारत
एक कदम स्वच्छता की ओर

केन्द्रीय विद्यालय संगठन
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छात्रों के लिए

प्रिय विद्यार्थियो,

वर्तमान शैक्षणिक सत्र कई मायनों में ऐतिहासिक रहा है। महामारी ने न केवल भौतिक कक्षाओं को बाधित किया बल्कि आभासी शिक्षणके माध्यम से शिक्षकों के मार्गदर्शन मेंकक्षा गतिविधियों, विशेष रूप से लेखन और इसके त्वरित सुधार को प्रतिस्थापित करने के लिए बाध्य कियाहै | जिससे परीक्षा के तौर-तरीकों से लेकर पूरी शिक्षण व्यवस्था में क्रांतिकारी बदलाव आया। प्रश्नों के निर्माण से लेकर उनके मूल्यांकन और परीक्षाओं की संख्या और परीक्षा की अवधि तक- परिवर्तन से कुछ भी अछूता नहीं रहा है। यह वह समय है जब हम इन परिवर्तनों को अपनाने के लिए खुद को तैयार करते ह जैसा कि हमने आभासी कक्षाओं के मामले में, परीक्षा के परिदृश्य में किया है और महामारी के कारण हमारे सामने आने वाली चुनौतियों में छुपी संभावनाओं का पता लगाया है।

नई शिक्षा नीति भी हमारे ज्ञान परिदृश्य में बड़े पैमाने पर सकारात्मक परिवर्तन का एक माध्यम है। आइए, हम इन सभी परिवर्तनों का स्वागत कर और परिवर्तन के आह्वान का उत्तर देने वाले प्रथम व्यक्ति होने पर स्वयं को गौरवान्वित महसूस कर।

हमने अभी-अभी जो प्रथम सत्र की परीक्षा संपन्न की है, वह वस्तुनिष्ठ मूल्यांकन आधारित है। आगामी महीनों में आप जिसद्वितीय सत्र की परीक्षा में प्रतिभाग करेंगे, वह परीक्षा विषयपरकवस्तुनिष्ठ एवं बहुविकल्पीय का सम्मिलित रूप होने की संभावना है, यह सीबीएसई द्वारा दी गईसूचना पर निर्भर करता है। ब्लूप्रिंट, प्रश्न पत्र का डिज़ाइन और विनिर्दश अलग-अलग विषय में भिन्न-भिन्न होंगे और आपको सीबीएसई और विद्यालय द्वारा नियत समय में सूचित किया जाएगा। अतः पाठ को ध्यान से पढ़ना और उसे अच्छी तरह समझना अत्यधिक महत्वपूर्ण है। इसलिए कृपया पाठ्यवस्तु को पढ़ने और लिखने के अभ्यास को अपनी सभी शैक्षणिक गतिविधियों का केंद्र बनाएं। अपनी एनसीईआरटी पुस्तकों को अपनी मुख्य पुस्तकों के रूप में प्राथमिकता दें और समर्पित शिक्षकों की एक टीम द्वारा तैयार की गई अध्ययन सामग्री का भी अवलोकन अवश्य करें, जिन्होंने हमारे सभी प्रिय विद्यार्थियों की आवश्यकताओं को समझकर उसके अनुरूप सामग्री को विकसित करने में पर्याप्त समय दिया है। प्रत्येक विषय एवं पाठ की प्रासंगिकता और संक्षिप्तता पर ध्यान दिया गया है- यह सामग्री आपकी एनसीईआरटी पुस्तकों की पूरक है और किसी भी तरह से इसे इसके विकल्प के रूप में नहीं लियाजाए |

मुझे यकीन है कि इस अध्ययन सामग्री में आपको द्वितीय सत्र के लिए आवश्यकसभी इकाइयाँ / अध्याय एक साथ उपलब्ध होंगे , माइंड मैप, टेबल, नमूना परीक्षण सामग्री आदि आपके लिए उपयोगी सिद्ध होंगे। यह जरूरी है कि आप स्वयं को अद्यतन रख और अध्ययन सामग्री को प्राप्त करने के उपरांतभी भविष्य में होने वाले किसी भी अन्य बदलाव के लिए सीबीएसई की वेबसाइट का नियमित रूप से अवलोकन करते रहें। आशा है कि शिक्षकों के अथक प्रयास सेनिर्मितयहअध्ययन सामग्री आपको अपने दूसरे सत्र की परीक्षा में श्रेष्ठ प्रदर्शन करने में सहायक सिद्ध होगी।

शुभकामनाएँ |

A Note to the students

Dear Students,

The current academic session has been historic in a number of ways. The pandemic not only forced shutting down of onsite classes and substituting them with online, virtual mode of teaching, a number of classroom activities, esp. writing under guidance of teachers and its prompt correction too has taken a backseat. On the examination front, the entire setup has undergone a revolutionary change. From typology of questions to their evaluation and to number of examination and duration of examination- nothing has remained untouched by these winds of change. This is the time we gear up ourselves to embrace these changes in examination landscape as we have done in case of online classes and explore possibilities in the challenges thrown before us by the pandemic.

The New Education Policy, too is an agent of a massive changes in our knowledge landscape. Let us amalgamate all these changes and feel proud ourselves to be the first to answer the call of CHANGE.

The first term examination that you have just taken has been an objective assessment. The second term that you will take in coming months is likely to be a combination of subjective and objective, depending on situation as intimated by the CBSE.The blueprint, design of question paper and specifications will differ from subject tosubject and will be intimated to you in due course of time by the CBSE. So what remains important is to read the text and understand it thoroughly. So please make reading the text and practice writing the center of all your academic activities. Treat your NCERT books as your holy books and also go through the study material prepared by a team of dedicated teachers who have devoted sufficient time in understanding and then developing the content to suit the needs of all our dear students. Focus has been on relevance and conciseness- the content strictly is a supplement to your NCERT books and in no way it should be treated as a substitute to it.

I am sure the content in study material where you will find all units / chapters for SECOND TERM at a glance, mind maps, tables, and sample test items will be useful to you. However, it is imperative you keep your self-updated and also visit CBSE website regularly for any further changes that may take place after the study material has been prepared. Hope the efforts of your teachers in preparing this material will help you perform very well in your second term examination.

All the Best.

ECONOMICS (2021-22)

CLASS XI - TERM-2 CURRICULUM

Units	TERM 2 - SUBJECTIVE QUESTION PAPER Theory: 40 Marks Time: 2 Hours	Marks
Part A	**Statistics for Economics**	
	Statistical Tools and Interpretation – ⟩ Measures of Dispersion, ⟩ Correlation ⟩ **Introduction to Index Numbers**	17
	Sub	**17**
Part B	**Introductory Microeconomics**	
	Producer Behaviour and Supply	13
	Forms of Market and Price Determination under perfect competition with simple applications	10
	Sub Total	**23**
	Total	**40**
Part C	**Project Work (Part 2): 10 Marks**	50

Part A: Statistics for Economics

Unit 3: Statistical Tools and Interpretation

Measures of Dispersion - absolute dispersion standard deviation); relative dispersion co- efficient of variation)

Correlation – meaning and properties, scatter diagram; Measures of correlation - Karl Pearson's method (two variables ungrouped data)

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

Part B: Introductory Microeconomics

Unit 6: Producer Behaviour and Supply

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.

Supply, Market supply, determinants of supply, supply schedule, supply curve and its slope, movements along and shifts in supply curve, price elasticity of supply; measurement of price elasticity of supply - percentage-change method.

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

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

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

PART- A : STATISTICS FOR ECONOMICS

UNIT-3 MEASURES OF DISPERSION

'Dispersion is the measure of the variation of the items'.

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:- When dispersion of the series is expressed in terms of the original unit of the series, it is called absolute measure of dispersion.

a) Range
b) Quartile Deviation

c) Mean Deviation

d) Standard Deviation

Relative Measures of Dispersion:- The relative measure of dispersion expresses the variability of data in items of some relative value or percentage.

a) Coefficient of Range

b) Coefficient of Quartile Deviation

c) Coefficient of Mean Deviation

d) Coefficient of Variation

Standard Deviation (±)

'The standard deviation is the square root of the arithmetic mean of the squares of all deviations, Deviations being measured from arithmetic mean of the items'. .

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 = ∃

Coefficient of standard deviation: $\frac{\pm}{\overline{X}}$

Variance = $\exists^2$

Coefficient of variation = $\frac{\pm}{\overline{X}} \mid 100$

$\frac{\text{Computation of } \pm}{\text{Individual Series}}$

1. $\pm \; X \sqrt{\frac{\phi x^2}{N}}$ Actual Mean Method

   $x = X \; Z \overline{X}$

2. $\pm \; X \sqrt{\frac{\phi d^2}{N} Z \left(\frac{\phi d}{N}\right)^2}$ Assumed Mean Method

Individual Series :- calculate standard deviation and coefficient from the following:

Marks obtained by 5 students are: 6,8 10, 12,14

S.No	Marks(X)	Actual Mean method		Assumed Mean method	
		X=X-mean	X^2	dx(X-A)	dx^2
1	6	-4	16	-6	36
2	8	-2	4	-4	16
3	10	0	0	-2	4
4	12 A	2	4	0	0
5	14	4	16	2	4
N=5	∑X = 50		$\sum X^2$=40	∑dX= -10	$\sum dX^2$= 60

(i) Actual Mean method: x = ∑X / N = 50/5=10

$\pm X\sqrt{\frac{\phi x^2}{N}}$ $\pm X\sqrt{\frac{40}{5}}$

S.D.= 2.83

CSD =S.D./ x = 2.83 / 10 = 0.283

(ii) Assumed Mean method: $\pm X\sqrt{\frac{\phi d^2}{N} Z \frac{\phi d}{N}^2}$

$\pm X\sqrt{\frac{60}{5} Z \frac{Z10}{5}^2}$ = 2.83

CSD = SD / X = 2.83/ 10 = 0.283

Discrete / Continuous Series:

Calculate standard deviation and its coefficient By Actual mean method.

Marks	15	20	25	30	35
Frequency	2	3	6	7	2

Solution

Marks X	F	Actual Mean method			
		fX	(x= X- x)26	x^2	fx^2
15	2	30	-11	121	242
20	3	60	-6	36	108
25	6	150	-1	1	6
30	7	210	4	16	112
35	2	70	9	81	162
	N = 20	∑fX=520			$\sum fx^2$= 630

Actual Mean method :

i. $\pm X\sqrt{\frac{\phi fx^2}{N}}$ Actual Mean Method

$x = X Z\overline{X}$

x = ∑fX / N = 520/ 20 = 26

$\pm X\sqrt{\frac{630}{20}}$ = 5.61 SD= 5.61

CSD = SD/ x = 5.61 / 26 = 0.21

Assumed Mean Method

Calculate standard deviation and its coefficient By Assumed Mean method.

Marks	15	20	25	30	35
Frequency	2	3	6	7	2

solution

Marks X	F	Assumed Mean method			
		dx=x-A	dx^2	fdx	fdx^2
15	2	-10	100	-20	200
20	3	-5	25	-15	75
25 A	6	0	0	0	0
30	7	5	25	35	175
35	2	10	100	20	200
	N = 20			∑fdx =20	$\sum fdx^2$= 650

$$\pm X \sqrt{\frac{\phi fd^2}{\phi f} Z \frac{\phi fd}{\phi f}^2}$$

$$\pm X \sqrt{\frac{650}{20} Z \frac{20}{20}^2} \qquad =5.61$$

SD = 5.61

CSD = SD / x = where $\overline{X}$ = A + ∑fd /N 25+20/20 =26

CSD= 5.61/ 26= 0.21

. **CONTINUOUS SERIES (FREQUENCY DISTRIBUTION)**

Calculate standard deviation and its coefficient By **Actual mean method**.

Marks	0-4	4-8	8-12	12-16
Frequency	4	8	2	1

Solution : Actual Mean method :

Marks X	Mid-value (m)	f	Actual Mean method			
			Fm	(x=X- m) 6	x^2	fx^2
0-4	2	4	8	-4	16	64
4-8	6	8	48	0	0	0
8-12	10	2	20	4	16	32
12-16	14	1	14	8	64	64
		N = 15	∑fm=90			$\sum fx^2$= 160

$$\pm X \sqrt{\frac{\phi fx^2}{N}}$$ Actual Mean Method

$x = X Z \overline{X}$

x = ∑fm / N = 90 / 15 = 6

$$\pm X \sqrt{\frac{160}{15}}$$ SD = 3.26

CSD = SD/x = 3.26/6 = 0.54

Assumed Mean Method

Calculate standard deviation and its coefficient By **Assumed Mean method**.

Marks	0-4	4-8	8-12	12-16
Frequency	4	8	2	1

Solution : Actual Mean method :

Marks X	Mid-value (m)	f	Assumed Mean method			
			(dx=m-A) 10	dx^2	fdx	fdx^2
0-4	2	4	-8	64	-32	256
4-8	6	8	-4	16	-32	128
8-12	10 A	2	0	0	0	0
12-16	14	1	4	16	4	16
		N = 15			∑fdx=-60	$\sum fdx^2$= 400

$$\pm X \sqrt{\frac{\phi fd^2}{\phi f} Z \frac{\phi fd}{\phi f}^2}$$

$$\pm X \sqrt{\frac{400}{15} Z \frac{Z60}{15}^2}$$ **SD**=3.26

CSD = SD/x Where x=A+ ∑ fd / N = 10 + (-60/15) =6

CSD = 3.26 / 6 = 0.54

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.

COEFFICIENT OF VARIATION

Coefficient of variation is 100 times the coefficient of dispersion based on Standard deviation of the statistical series.

Karl Pearson: 'Coefficient of the variation is the percentage variation in the mean, the standard deviation being considered as the total variation in the mean' Coefficient of variation = $\frac{\pm}{\bar{X}} \mid 100$

Individual Series :- calculate coefficient of variation from the following:

Marks obtained by 5 students are: 6,8 10, 12,14

S.No	Marks(X)	Actual Mean method		Assumed Mean method	
		X=X-mean	X^2	dx(X-A)	dx^2
1	6	-4	16	-6	36
2	8	-2	4	-4	16
3	10	0	0	-2	4
4	12 A	2	4	0	0
5	14	4	16	2	4
N=5	∑X = 50		$\sum X^2$=40	∑dX= -10	$\sum dX^2$= 60

$\bar{X}$ = ∑X / N = 50/5=10

$\pm X\sqrt{\frac{\phi x^2}{N}}$ $\pm X\sqrt{\frac{40}{5}}$

S.D.= 2.83

Coefficient of variation = $\frac{\pm}{\bar{X}} \mid 100$

Coefficient of variation = $\frac{2.8}{10} \mid 100$

CV= 28

Discrete / Continuous Series:

Calculate coefficient of variation from the following data..

Marks	15	20	25	30	35
Frequency	2	3	6	7	2

solution

Marks X	F	Assumed Mean method			
		dx=x-A	dx^2	fdx	fdx^2
15	2	-10	100	-20	200
20	3	-5	25	-15	75
25 A	6	0	0	0	0
30	7	5	25	35	175
35	2	10	100	20	200
	N = 20			∑fdx =20	$\sum fdx^2$= 650

$\bar{X}$ = A + ∑fd /N = 25+20/20 =26

$\pm X\sqrt{\frac{\phi fd^2}{\phi f} Z \frac{\phi fd}{\phi f}^2}$

$\pm X\sqrt{\frac{650}{20} Z \frac{20}{20}^2}$ =5.61

SD = 5.61

Coefficient of variation = $\frac{\pm}{\overline{X}} \mid 100$

Coefficient of variation = $\frac{5.61}{26} \mid 100$

CV= 21.57

CONTINUOUS SERIES (FREQUENCY DISTRIBUTION)

Find Coefficient of variation from following set of data.

Marks	0-4	4-8	8-12	12-16
Frequency	4	8	2	1

Solution :

Marks X	Mid-value (m)	F	Assumed Mean method			
			(dx=m-A) 10	dx^2	fdx	fdx^2
0-4	2	4	-8	64	-32	256
4-8	6	8	-4	16	-32	128
8-12	10 A	2	0	0	0	0
12-16	14	1	4	16	4	16
		N = 15			$\sum fdx$= -60	$\sum fdx^2$= 400

$$\pm X \sqrt{\frac{\phi fd^2}{\phi f} Z \frac{\phi fd}{\phi f}^2}$$

$$\pm X \sqrt{\frac{400}{15} Z \frac{Z60}{15}^2}$$ **SD**=3.26

$\overline{X}$ = A + $\sum$fd /N = 10 + (-60/15) =6

. Coefficient of variation = $\frac{\pm}{\overline{X}} \mid 100$

Coefficient of variation = $\frac{3.26}{6} \mid 100$

CV= 54.33

Q. Calculate Standard Deviation & it's coefficient using Short-cut method :

Class-interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	12	18	27	20	17	6

Solution :

Class-interval	Frequency	m	d=m-A	fd	d^2	fd^2
0-10	12	5	-30	-360	900	10800
10-20	18	15	-20	-360	400	7200
20-30	27	25	-10	-270	100	2700
30-40	20	35 A	0	0	0	0
40-50	17	45	10	170	100	1700
50-60	6	55	20	120	400	2400
	∑f=100			∑fd=-700		$\sum fd^2$=24800

$$\sigma = \sqrt{\sum fd^2/\sum f - (\sum fd/\sum f)^2} = \sqrt{24800/100 - (-700/100)^2} = \sqrt{248-49} = 14.106$$

$\bar{X} = \sum fd/\sum f = 35 + \frac{-700}{100} = 35-7 = 28$

Coefficient of S.D= $\sigma / \bar{X}$ =14.106/28 = 0.50

(RANGE, QUARTILE DEVIATION, MEAN DEVIATION & ITS CO-EFFICIENT Deleted Year 2021-22 exam By CBSE Board)

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'.

Definition: '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'.

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

Degree	Positive	Negative
Perfect	+1	-1
High	Between +0.75 to +1	Between -0.75 to -1
Moderate	Between +0.25 to +0.75	Between -0.25 to -0.75
Low	Between +0 to +0.25	Between -0 to -0.25
Zero	0	0

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

(b) 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) **<u>Karl Pearson's Method</u>** : Karl Pearson has given a quantitative method of calculating correlation

$$r \; X \frac{\phi xy}{N \pm \; | \pm y}$$

Where X = X – X, Y = Y – Y

N = number of observations

∃ X = Standard deviation of series X

∃ Y = Standard deviation of series Y

OR

Actual Mean Method

$$R \; X \frac{\phi xy}{\sqrt{\phi x^2 \; | \; \phi y^2}}$$

Where x = X – X, y = Y – Y

Assumed Mean Method

$$r = \frac{\phi dxdy - \frac{\phi dx \mid \phi dy}{N}}{\sqrt{\phi dx^2 - \frac{(\phi dx^2)}{N}} \sqrt{\phi dy^2 - \frac{(\phi dy^2)}{N}}}$$

Where $dx = X - A$

$dy = Y - A$

A = assumed mean

Ex. : Calculate coefficient of co-relation given the following data :

X	2	3	4	5	6	7	8
Y	4	7	8	9	10	14	18

Solution:.

X	Deviation $(x = X - \bar{X})$ $\bar{X} = 5$	Square of deviation (x^2)	Y	Deviation $(y = Y - \bar{Y})$ $\bar{Y} = 5$	Square of deviation (y^2)	Multiple of deviation (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
$\sum X = 35$ $N = 7$ $\bar{X} = 5$	$\sum X = 0$	$\sum X^2 = 28$	$\sum Y = 70$ $N = 7$ $\bar{Y} = 10$	$\sum Y = 0$	$\sum Y^2 = 130$	$\sum X Y = 58$

$$R = \frac{\phi xy}{\sqrt{\phi x^2 \mid \phi y^2}} \quad R = \frac{58}{\sqrt{28x130}}$$

= +0.96 It is situation of high positive correlation.

Short- Cut Method: Fined Karl Pearson's coefficient of correlation By short-cut method**.**

X	dx(X-A) 60	dx^2	Y	dy(Y-A) 36	dy^2	dxdy
50	-10	100	20	-16	256	160
54	-6	36	22	-14	196	84
56	-4	16	24	-12	144	48
58	-2	4	30	-6	36	12
59	-1	1	32	-4	16	4
60 A	0	0	36 A	0	0	0
61	1	1	38	2	4	2
62	2	4	40	4	16	8
65	5	25	44	8	64	40
75	15	225	54	18	324	270
	$\sum dx = 0$	$\sum dx^2 = 412$		**$\sum dy = (-)20$**	**$\sum dy^2 = 1056$**	**$\sum dxdy = 628$**

$$r = \frac{\phi dxdy - \frac{\phi dx \mid \phi dy}{N}}{\sqrt{\phi dx^2 - \frac{(\phi dx^2)}{N}} \sqrt{\phi dy^2 - \frac{(\phi dy^2)}{N}}}$$

Where dx = X – A

dy = Y – A

A = assumed mean

$$r = \frac{628 - \frac{0 \mid 20}{10}}{\sqrt{412 - \frac{(0)}{10}} \sqrt{1056 - \frac{(20^2)}{10}}}$$

R= 0.97

There is high degree of positive correlation between series X and series Y.

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

Q. Affected by extreme values Find out Karl-Pearson's Coefficient of Correlation :

X	10	20	30	40	50
Y	4	6	8	10	12

Solution

X	dx=X-A	dx^2	Y	dy=Y-A	dy^2	dx.dy
10	-20	400	4	-4	16	80
20	-10	100	6	-2	4	20
30=A	0	0	8=A	0	0	0
40	10	100	10	2	4	20
50	20	400	12	4	16	80
	$\sum dx=0$	$\sum dx^2=1000$		$\sum dy=0$	$\sum dy^2=40$	$\sum dx.dy=200$

$$r = \frac{\sum dx.dy - \sum dx.dy/N}{\sqrt{\sum dx^2 - (\sum dx)^2/N} \times \sqrt{\sum dy^2 - (\sum dy)^2/N}}$$

$$r = \frac{200 - 0/5}{1000 - (0/5)^2 \times 40 - (0/5)^2} = 200/\sqrt{40000} = 200/200 = +1$$

Perfect Positive degree of rank correlation.

(Spearman's Rank Correlation Deleted Year 2021-22 exam By CBSE Board)

INDEX NUMBERS

Meaning: Index numbers is a statistical tool for measuring relative change in a group of related variables over two or more different times.

Definition : According to Croxton and Cowden, " index numbers are devices for measuring differences in the magnitude of a group of related variables".

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.

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

Advantages/uses/ importance of index numbers

a) It simplifies of complexity
b) It facilitates comparative study
c) Use in business sphere
d) Helpful and fixation of salary and allowances
e) To measure the change in value of money

Limitations of Index Number

a) Not completely true
b) International comparison is not possible
c) Difference of time
d) Limited use
e) Lack of retail price index number

Price index is of two types

a. **Simple Index Number**: These are the index numbers in which all items of the series are accorded equal weightage or importance.
b. **Weighted price Index numbers**: These are the index numbers in which different items of the series are accorded different weightage, depending upon their relative importance.

Construction of simple Index Numbers:-

There are two methods

a. Simple aggregate Method

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

Given the following data and assuming 2011as the base year. Find out index value of the prices of different commodities for the year 2019.

Commodity	A	B	C	D	E
Price 2011	50	40	10	5	2
Price 2019	80	60	20	10	6

Sol.

Commodity	2011 Price (Rs) (P_0)	2019 Price (Rs) (P_1)
A	50	80
B	40	60
C	10	20
D	5	10
E	2	6
	$\sum P_0 = 107$	$\sum P_1 = 176$

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

$$= 164.49$$

Simple Average of price relative method

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

.Given the following data and using the price relative method construct and index number for the year 2019 in relation to 2011.

Commodity	Wheat (per qt.)	Ghee(per kg)	Milk (per lt.)	Rice(per qt.)	Sugar(per kg)
2011 Price(Rs.)	100	8	2	200	1
2019 Price (rs.)	200	40	16	800	6

Sol.

Commodity	Base Year 2011 (P_0)	Current Year 2019 (P_1)	Price relatives $\frac{\sum P_1}{\sum P_0} \times 100$
Wheat	100	200	200
Ghee	8	40	500
Milk	2	16	800
Rice	200	800	400
Sugar	1	6	600
N=5			$\frac{\sum P_1}{P_0} \times 100$ = 2500

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

2500/5 = 500

Weighted Index Numbers

There are two methods:-

a. Weighted Aggregate method:- In this method commodities are assigned weights on the basis of quantities purchased. Some of the well-known are as under

(i) **Laspeyre's Method** : Laspeyre uses base year quantities (q_0) as weights of different items. As

$$P_{01} = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100$$

(ii) Paasche's Method : Paasche's uses current years quantities (q_1) as weight.

$$P_{01} = \frac{\sum P_1 Q_1}{\sum P_0 Q_1} \times 100$$

formula

(iii) **Fisher's Method**: Fisher has combined the techniques of Laspeyre's and Paasche's method. He used both base year as well as current year quantities (q_0, q_1) as weight.

$$P_{01} = \sqrt{\frac{\sum P_1 Q_0}{\sum P_0 Q_1} \times \frac{\sum P_1 Q_1}{\sum P_0 Q_0}} \times 100$$

Ex.

Items	2011 Base year		2019 Current Year	
	Price	Quantity	Price	Quantity
A	10	10	20	25
B	35	3	40	10
C	30	5	20	15
D	10	20	8	20
E	40	2	40	5

Sol.

Items	2011 Base year		2019 Current Year		(P_0Q_0)	(P_0Q_1)	(P_1Q_0)	(P_1Q_1)
	Price (P_0)	Qty(Q_0)	Price (P_1)	Qty (Q_1)				
A	10	10	20	25	100	250	200	500
B	35	3	40	10	105	350	120	400
C	30	5	20	15	150	450	100	300
D	10	20	8	20	200	200	160	160
E	40	2	40	5	80	200	80	200
Total					635	1450	660	1560

(i) Laspeyre's Method:

$$P_{01} = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100$$

$= 103.94$.

(ii) Paasche's Method:

$$P_{01} = \frac{\sum P_1 Q_1}{\sum P_0 Q_1} \times 100$$

$= 107.59$

(iii) Fisher's Method:

$$P_{01} = \sqrt{\frac{\sum P_1 Q_0}{\sum P_0 Q_1} \times \frac{\sum P_1 Q_1}{\sum P_0 Q_0}} \times 100$$

= 105

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.

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

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

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

Ex. Construct cost of living for 2011 based on 2019 from the following data :

Group	Food	Housing	Clothing	Fuel & light	Misc.
Group Index No. for 2019 (based on 2011)	122	140	112	116	106
Weights	32	10	10	6	42

Sol.

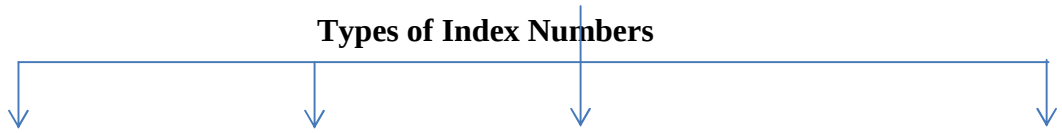
Group	Group Index No.(R)	Weights (W)	Weighted relatives (RW)
Food	122	32	3904
Housing	140	10	1400
Clothing	112	10	1120
Fuel & light	116	6	696
Misc.	106	42	4452
Total		∑W = 100	∑RW = 11572

Cost of living index no. =

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

= 115.72

1. Types of Index Numbers



Consumer Price Index/Cost of living Index (CPI)

Whole Sale Production (WPI)

Index of Industrial (IIP)

SENSEX Price Index

1.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** $P_{01} = \frac{\sum RW}{\sum W}$

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

$W = P_0 Q_0$ or fixed weights

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.

2. 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

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

Q. – From the following data, calculate price index number for the years 2019 taking 2017 as a base year, by using Fisher Method.

ommodity (वस्तु)	2017	2017	2019	2019
	Price	**Q**	**Price**	**Q**
A	20	4	40	6
B	50	3	60	5
C	40	5	50	10
D	20	10	40	20

Ans. $\sqrt{\frac{\Sigma p_1 q_0}{\Sigma p_0 q_0} \times \frac{\Sigma p_1 q_1}{\Sigma p_0 q_1}} \times 100$

$\sqrt{990/630 \times 1840/1170}$ x 100

$\sqrt{1.5714 \times 1.5726}$ x 100

$\sqrt{2.4711}$ x 100

1.5719 x 100=157.19

Q. Construct Laspeyre's and Paasche's price indices for 2020 with 2014 as base year.

Items	2014		2020	
	Price	Quantity	Price	Quantity
A	2	6	4	8
B	0.4	40	1	36
C	0.5	24	0.25	32

Ans. rise in WPI indicates excess demand and fall in WPI implies deficient demand

b)

P_0	Q_0	P_1	Q_1	P_0Q_0	P_1Q_0	P_1Q_1	P_0Q_1
2	6	4	8	12	24	32	16
0.4	40	1	36	16	28	36	14.4
0.5	24	0.25	32	12	8	8	16
				$\sum$=40	$\sum$=60	$\sum$=76	$\sum$=46.4

Laspeyre's $=\sum P_1Q_0 / \sum P_0Q_0 * 100$ 60 /40 * 100
=150

Paasche's= $\sum P_1Q_1 / \sum P_0Q_1 * 100$
=163.79

(Index Number of Industrial Production Deleted Year 2021-22 exam By CBSE Board)

PART-'B' MICROECONOMICS

UNIT-3 PRODUCTTION FUNCTION

PRODUCTION FUNCTION - The production is purely a technical relationship between physical input and physical output of a firm.

Q = f (L, Lr, C, E).

L = Land; Lr = Labour; C = Capital; E = Entrepreneur.

Fixed and Variable Factors

Factors of production are classified as:

(i) Fixed factors (ii) Variable factors

(ii) **Fixed Factor:** The factor whose quantity remains fixed with the level of output.
(iii) **Variable Factor:** Those inputs which change with the level of output.

Difference between Short Run & long Run

Basis	Short Run	Long Run
Meaning	Only variable factors are changed	All factors are changed
Price Determination	Demand is active.	Both demand & supply play an important role.
Classification	Factors are classified as fixed & variable.	All factors are variable.

SHORT PERIOD AND LONG PERIOD PRODUCTION FUNCTION

SHORT PERIOD PRODUCTION FUNCTION	LONG PERIOD PRODUCTION FUNCTION
1. Time period which is less than the minimum period required for the change of inputs.	1. Time period, which is long enough to change all the inputs?
2.Some inputsare variable	2.All inputs are variable
3. Production can be changed only up to level of production by changing variable production.	3. Production can be changed by changing scale or changing all inputs simultaneously.
4. Entry and exit is restricted of New firm in industry.	4. Entry and exit is not restricted of New firm in industry.

TOTAL, MARGINAL AND AVERAGE PRODUCTION OF THE VARIABLE FACTOR

TOTAL PRODUCT – The Aggregate quantity of a product by a firm with the help of a specific input combination (one variable and other fixed) is called the firm's total product.

TP = ΣMP TP = AP x No of Variable Fact

AVERAGE PRODUCT – AP is defined as the output per unit of variable input. It is obtained by dividing Total Product by the quantity of variable factor.

AP = TP / Unit of Variable Factor

MARGINAL PRODUCT – It is defined as change in total product when an additional unit of Variable factor get employed, keeping other factors fixed.

$MP_n = TP_n - TP_{n-1}$

MP = ΔT P/ Δ Variable

LAW OF VARIABLE PROPORTION OR RETURNS TO A VARIABLE FACTOR

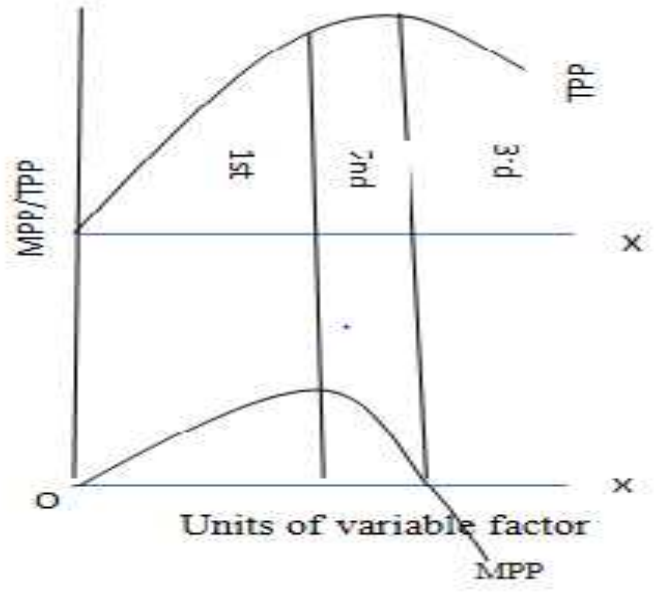
Statement of law of variable proportion: In short period, when only one variable factor is increased, keeping other factors constant, the total product (TP) initially increases at an increasing rate, then increases at a decreasing rate and finally TP decreases.

MPP initially increase 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**	**Phase**
5	**0**	**0**	**-**	**I - Increasing returns to a factor**
5	**1**	**5**	**5**	
5	**2**	**15**	**10**	
5	**3**	**30**	**15**	
5	**4**	**40**	**10**	**II – diminishing returns to a factor**
5	**5**	**45**	**5**	
5	**6**	**45**	**0**	
5	**7**	**40**	**-5**	**III - Negative returns to a factor**



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

- TPP increases at an increasing rate
- MPP also increases.

Phase II / Stage II / Diminishing returns to a factor

- TPP increases at decreasing rate
- MPP decreases / falls
- This phase ends when MPP is zero & TPP is maximum

Phase III / Stage III / Negative returns to a factor

- TPP diminishes / decreases
- MPP becomes negative.

SHORT RUN PRODUCTION FUNCTION – LAW OF VARIABLE PROPORTION

Behavior of Total Product	TP increases With increases rate.	TP increases with diminishing rate.	TP Maximum	TP starts falling
Behavior of Marginal Product	MP Increases	MP decreases	MP becomes zero	MP becomes negative
Behavior of Average Product	AP increases	AP increases and intersects MP and then starts falling.	AP decreases	AP decreases
Stages of Production	Increasing Returns to a Factor	Increasing Returns to a Factor	Constant Returns to a Factor	Negative Returns to a Factors

Causes of Increasing Returns to a factor:-

1. Better utilization of underutilized fixed factors.
2. Labour division benefits.
3. Efficient use / utilization of variable factor.
4. Better coordination

Causes of Diminishing Returns to a factor:-

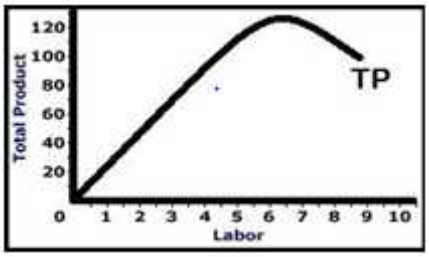
1. Inadequate factor proportion.
2. Optimum combination.
3. Imperfect substitution of factors
4. Poor Coordination
5. Over utilization of Factor

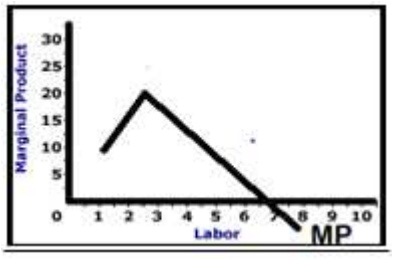
Reasons for negative returns to a factor

1. Limitation of fixed factors
2. Poor coordination between variable and fixed factor
3. Decrease in efficiency of variable factors.

Relation between MP(MPP) and TP(TPP):

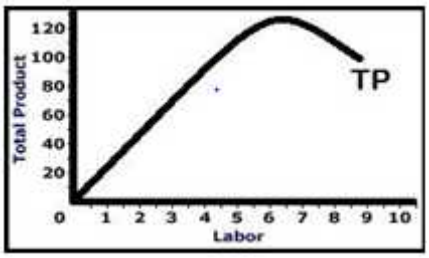
1. As long as MPP increases, TPP increases at an increasing rate.
2. When MPP decreases, TPP increases diminishing rate.
3. When MPP is Zero, TPP is maximum.
4. When MPP is negative, TPP starts decreasing.

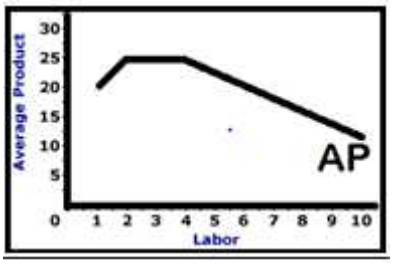




Relation between TP(TPP) and AP:

1. When TP Increases at increasing rate, AP rises.
2. When TP begins to rise at diminishing rate, AP is maximum and constant
3. When TP increases at diminishing rate, AP falls.
4. When TP is maximum and constant, AP falls.
5. When TP decreases, AP continues to fall.





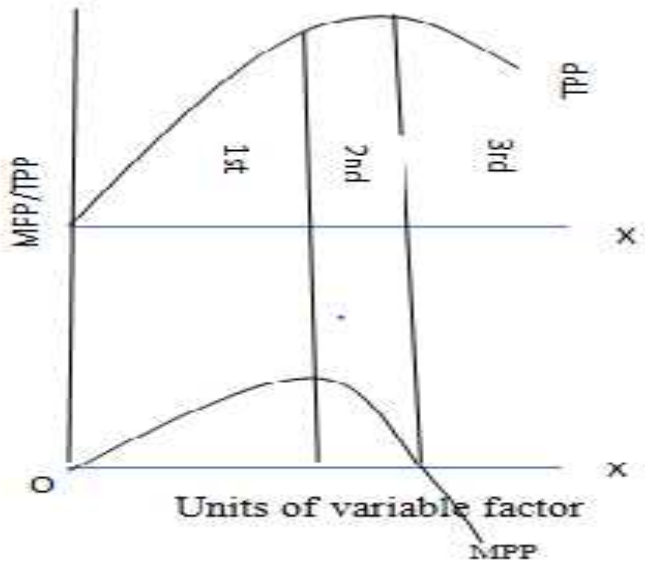
SHORT & LONG ANSWER TYPES QUESTION

Q1. State the different phases of change in total production to the law of variable proportions. Use diagram.

Ans.- **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 increase then falls but remains positive then 3rd phase becomes negative.

Total product and marginal product curves:



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

- TPP increases at an increasing rate
- MPP also increases.

Phase II / Stage II / Diminishing returns to a factor

- TPP increases at decreasing rate
- MPP decreases / falls
- This phase ends when MPP is zero & TPP is maximum

Phase III / Stage III / Negative returns to a factor

- TPP diminishes / decreases
- MPP becomes negative.

Q2.Complete the following table:

Unit	Average Productio	Marginal Product
1	16	-
2	20	-
3	-	20
4	18	-
5	-	8
6	14	-

Ans:

Unit	Average Productio	Marginal Product	Total Production
1	16	16	16
2	20	24	40
3	20	20	60
4	18	12	72
5	16	8	80
6	14	4	84

Q3. Giving reasons, state whether the following statements are true or false:

(i) Average product will increase only when marginal product increases.

(ii) Under diminishing returns to factor, total product continues to increases till marginal product reaches Zero.

Ans. (i) The statement is false. Average product can rise even when MP falls.

(ii)The statement is true. Under diminishing returns to a factor, MP tends to fall. Falling MP implies that TP increases at a diminishing rate. TP is maximum when MP= 0

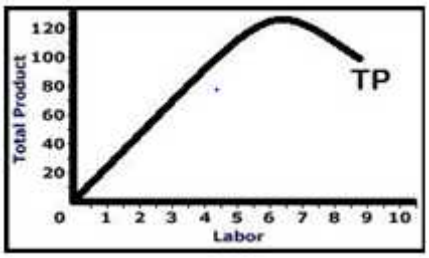
Q4. Explain the relationship between TP and AP with the help of a diagram.

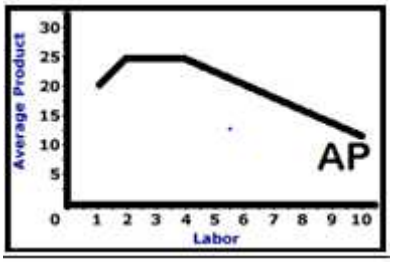
Ans. Relation between TP(TPP) and AP:

1. When TP Increases at increasing rate, AP rises.
2. When TP begins to rise at diminishing rate, AP is maximum and constant
3. When TP increases at diminishing rate, AP falls.

4. When TP is maximum and constant, AP falls.

5. When TP decreases, AP continues to fall.





Q5.What is the deferent phases in law of variable proportions, in terms marginal product ? Give reasons behind each phase.

Ans. Deferent phases in law of variable proportions, in terms marginal product

Phase I - Increasing returns to a factor.

- TPP increases at an increasing rate
- MPP also increases.

Phase II - Diminishing returns to a factor

- TPP increases at decreasing rate
- MPP decreases / falls
- This phase ends when MPP is zero & TPP is maximum

Phase III Negative returns to a factor

- TPP diminishes / decreases
- MPP becomes negative.

Reasons Behind Each Phase

Reasons of Increasing Returns to a factor:-

1. Better utilization of underutilized fixed factors.
2. Labour division benefits.
3. Efficient use / utilization of variable factor.
4. Better coordination

Reasons of Diminishing Returns to a factor:-

1. Inadequate factor proportion.
2. Optimum combination.
3. Imperfect substitution of factors
4. Poor Coordination
5. Over utilization of Factor

Reasons for negative returns to a factor

1. Limitation of fixed factors
2. Poor coordination between variable and fixed factor
3. Decrease in efficiency of variable factors.

SHORT & LONG ANSWER TYPES QUESTION (CBSE BOARD)

Q1. Explain the law of variable proportions with the help of total product and marginal product curves. (Delhi 2013)

Q2. Complete the following table: (Delhi 2013)

Unit	Average Productio	Marginal Product
1	8	-
2	10	-
3	-	10
4	9	-
5	-	4
6	7	-

Q3.Giving reasons, state whether the following statements are true or false: (AI 2013)

(iii) Average product will increase only when marginal product increases.

(iv) Under diminishing returns to factor, total product continues to increases till marginal product reaches Zero.

Q4. Explain the behavior of marginal product in the law of variable proportions .Explain the causes of the behavior. (Delhi 2014)

Q5. State the deferent phases of change in total product according to the law of variable proportions. Use diagram. (F 2014)

Q6. What are the deferent phases in law of variable proportions .in terms of total product? Give reasons behind each phase. Use diagram. (F 2015)

Q7.What are the deferent phases in law of variable proportions. in terms marginal product ? Give reasons behind each phase. Use diagram. (AI 2015)

Q9. Define production function. Distinguish between short run and long run production functions. (Delhi 2016) (OR) How 'returns to a factor' is different from 'returns to scale'?

Q10. Define marginal product. State the behavior of marginal product when only one input is increased and other inputs are held constant. (AI 2016)

Q11. What type of production function is this in which only one input is increased and others kept constant? State the behavior of total product in this production function. (F 2016)

Q12. Explain the relationship between AP and MP with the help of a diagram.

UNIT-3 COST

'Cost refers to the expenditure incurred by a producer on the factor as well as non-factor inputs for a given output of a commodity'.

Explicit cost : Actual payment made on hired factors of production. It is opportunity cost of purchasing inputs from the market. For example wages paid to the hired labourers, rent paid for hired accommodation, cost of raw material etc.

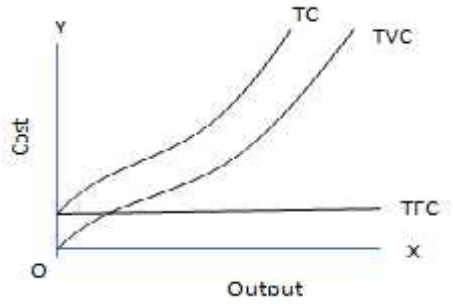
Implicit cost : Cost incurred on the self - owned factors of production. It is opportunity cost of using self owned inputs.For example, interest on owners capital, rent of own building, salary for the services of entrepreneur etc.

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

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

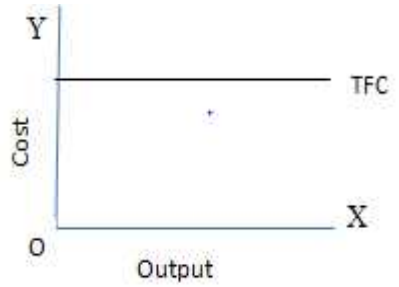
1. Total Cost:- The sum total of expenditure incurred by the firm in production of a given quantity of commodity.

TC = TVC + TFC



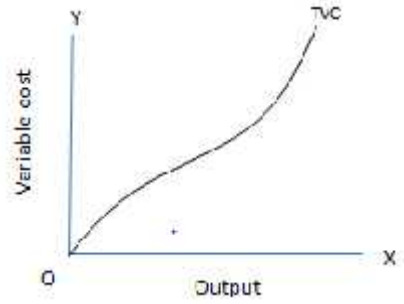
(a) Fixed Cost (Total fixed/ Indirect cost) :- Fixed cost refer to the cost which are incurred on the fixed factors of production. These costs remain fixed whatever may be the scale of output. These costs are present even when the output is zero. These costs are present in short run but disappear in the long run.

Output	**0**	**1**	**2**	**3**	**4**	**5**
TFC Rs	**10**	**10**	**10**	**10**	**10**	**10**



(b) Variable Cost (Total Variable / Prime cost/ Direct cost): TVC or variable cost – are those costs which vary directly with the variation 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.

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



Difference between TVC & TFC

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

Relation between TC, TFC and TVC

(i) Total cost can never be zero, even when the level of output is zero, because fixed cost is positive and constant at zero level of output.

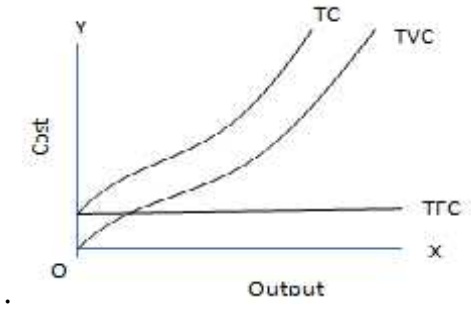
(ii) As the level of output increases, total cost also increases due to increase in variable cost

(iii) TFC is horizontal to x axis.

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

(v) At zero level of output TC is equal to TFC.

(vi) TC and TVC curves parallel to each other.



Output(Units)	Total Fixed Cost	Total Variable Cost	Total Cost
0	10	0	10
1	10	10	20
2	10	18	28
3	10	24	34
4	10	28	38
5	10	32	42
6	10	38	48
7	10	46	56
8	10	62	72

2.Average Cost (Average Total Cost): AC is the cost per unit of output produced.

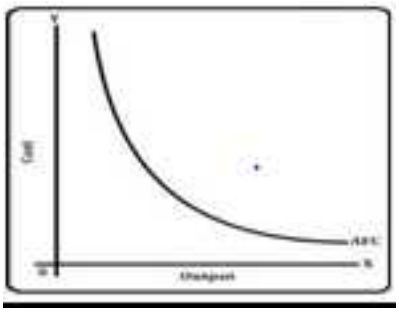
ATC = TC/Q

TC = AFC + AVC

(a) Average fixed cost It is the fixed cost per unit of output. AFC continuously decreases with increase in output as TFC is remain constant. Its shape is rectangular hyperbola.

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.



Unit	TFC	AFC
1	10	10
2	10	5
3	10	3.3
4	10	2.5

(b) Average variable cost : Average variable is the cost per unit of the variable cost of production.

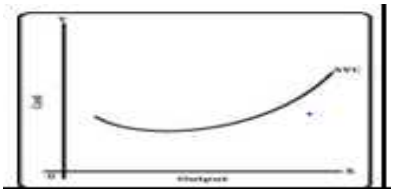
AVC = TVC / output.

AVC falls with every increase in output initially. Once the optimum level of output is reached AVC starts rising. Average total cost (ATC) or Average cost (AC) : refers to the per unit total cost of production.

ATC = TC / Output

AC = AFC + AVC

axis as TFC can never be zero.



Unit	TVC	AVC
1	10	10
2	18	9
3	24	8
4	28	7

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.

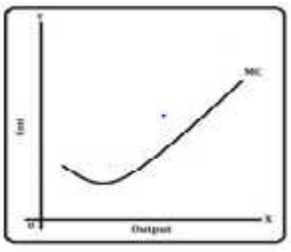
Marginal Cost :- 'Marginal cost is the addition to total cost due to the addition of one unit of output'.

$MC_n = TC_n - TC_{n-1}$

$MC = \Delta TC / \Delta Q$

Note : MC is not affected by TFC.

Output(Units)	Total Fixed Cost	Total Variable Cost	Total Cost	Marginal Cost
0	10	0	10	-
1	10	10	20	10
2	10	18	28	8
3	10	24	34	6
4	10	28	38	4
5	10	32	42	4
6	10	38	48	6
7	10	46	56	8
8	10	62	72	16

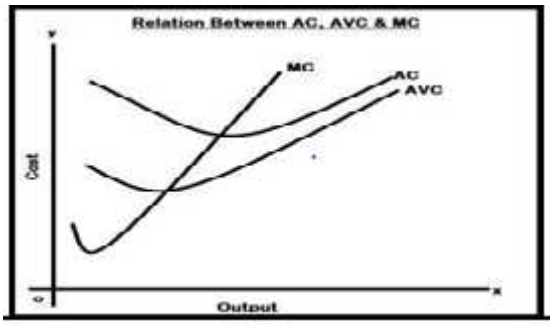


Relationship between AC and MC

1. Both AC & MC are derived from TC
2. Both AC & MC are "U" shaped (Law of variable proportion)
3. When AC is falling MC also falls & lies below AC curve.
4. When AC is rising MC also rises & lies above AC
5. MC cuts AC at its minimum where MC = AC

Relation Ship Between (AC), (AVC) and (MC)

1. When AC and AVC declines, MC declines faster than AC and AVC. So that MC curve Remain below AC curve and AVC curve.
2. When AVC increases, MC increases faster than AVC. So that MC is above AVC curve.
3. When AC increases, MC increases faster than AC. So that MC is above AC curve.
4. Since MC declines faster than AC and AVC its reaches its lowest point earlier than AC and AVC. So that MC starts rising even AC and AVC is falling.
5. MC must cut AC and AVC from its lowest point.



Relationship between Total Cost (TC) and Marginal Cost (MC)

1. When MC is falling, TC/TVC increases at a diminishing rate.
2. When MC is minimum, TC/TVC stops increasing at a diminishing rate.
3. When MC is rising, TC/TVC increases at an increasing rate.

Important formulae at a glance

- TFC = TC – TVC or TFC=AFC x output or TFC = TC at zero output.
- TVC = TC – TFC or TVC = AVC x output or TVC =∑MC
- TC = TVC + TFC or TC = AC x output or TC = ∑ MC + TFC
- $MC_n=TC_n – TC_{n-1}$ or $MC_n= TVC_n – TVC_{n-1}$
- AFC = TFC / Q(Output) or AFC = AC-AVC or ATC – AVC
- AVC = TVC / Q(Output) or AVC = AC-AFC
- AC = TC / Q(Output) or AC=AVC + AFC

Question:- **Complete the following**

Output(Units)	TVC(Rs.)	AVC(Rs.)	MC(Rs.)
1	20	-	-
2	-	16	12
3	54	-	-
4	-	20	26

TVC: 20,32,54,80 AVC: 20,16,18,20 MC: 20,12,22,26

Question: Numerical: From the following data on the cost of production of a firm, calculate TFC, AFC,TVC, AVC and MC;

Output(Kg.)	TC(Rs.)
0	**60**
1	**80**
2	**100**
3	**111**
4	**116**
5	**130**
6	**150**

Ans. TFC: 60 at every level, AFC: ∞, 60, 30, 20,15,12,10
TVC: 20,40,51,56,70,90 AVC:-,20,20,17,14,14,15
MC; 20,20,11,5,14,20

MCQ

Q1. Total cost at zero level of output will be :

(a) TFC (b) TVC

(c) AC (d) AFC

Q2. MC curve is _____ shaped.

(a) L –shaped (b) Straight line

(c)U-shaped (d) Inverse S shaped

Q3. Average fixed cost is indicated by:

(a) Rectangular hyperbola (b) A straight line parallel to X-axis

(c) A straight line parallel to Y-axis (d) U-shaped curve

Q4.Whiich of the following indicates fixed cost?

(a)Electricity bill (b) Expenses on raw material

(c)Wages of daily workers **(d) Interest on fixed capital**

Q5.When production is zero, total cost will be;

(a)Zero (b) Equal to variable cost

(c) Equal to total fixed cost (d) Equal to marginal cost

Q6.When MC curve cuts AC curve:

(a) AC = MC (b) AC = MC

(c)AC > MC (d) Both AC and MC are falling

Q7. When production level is zero, then fixed cost is;

(a)Zero (b) Negative

(c)Positive (d) equal to variable cost

Q8.AC, AVC and MC curves are ‘U’ shaped because of :

(a Law of Diminishing Marginal Utility **(b) Law of Variable Proportions**

(c) Law of Diminishing Return (d) None of these

Q9.When AC is rising, MC curve is

(a)Equal to AC **(b) More than AC**

(c)Less than AC (d) Constant

Q10.Which cost refers to actual payment made by the entrepreneur to the providers of factor services;

(a)Explicit cost (b) Implicit cost

(c)Variable cost (d) fixed cost

SHORT & LONG ANSWER TYPES QUESTION

Q1. Explain the relationship between Average cost, marginal cost and average variable cost

Ans. Relation Ship Between (AC), (AVC) and (MC)

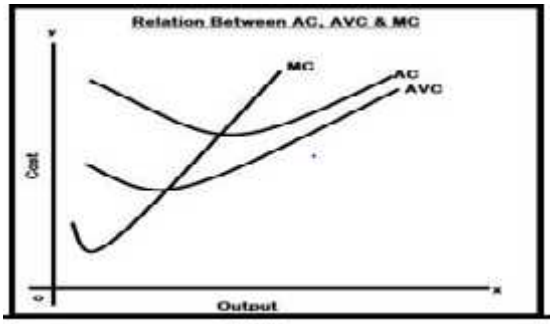
2. When AC and AVC declines, MC declines faster than AC and AVC. So that MC curve Remain below AC curve and AVC curve.

2. When AVC increases, MC increases faster than AVC. So that MC is above AVC curve.

3. When AC increases, MC increases faster than AC. So that MC is above AC curve.

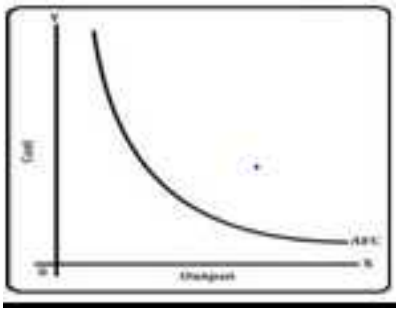
6. Since MC declines faster than AC and AVC its reaches its lowest point earlier than AC and AVC. So that MC starts rising even AC and AVC is falling.

7. MC must cut AC and AVC from its lowest point.



Q2.What is the behavior of (a) average fixed cost, and (b) average variable cost as more and more unit of good are produced?

Ans. (a) As more and more unit of good are produce, AFC goes on diminishing 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.



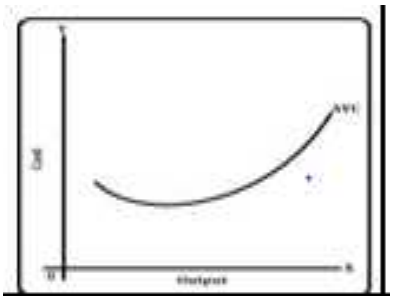
Unit	TFC	AFC
1	10	10
2	10	5
3	10	3.3
4	10	2.5

(b) Average variable cost : As more and more unit of good are produce, AVC initially falls , subsequently stabilise, and ultimately tends to rise, due to increasing and diminishing returns to a factor.

ATC = TC / Output

AC = AFC + AVC

axis as TFC can never be zero.



Unit	TVC	AVC
1	10	10
2	18	9
3	24	8
4	28	7
5	38	7.6

Q3. With the help of suitable diagram, explain the relationship between TC, TFC and TVC.

Ans. Relation between TC, TFC and TVC

(i) Total cost can never be zero, even when the level of output is zero, because fixed cost is positive and constant at zero level of output.

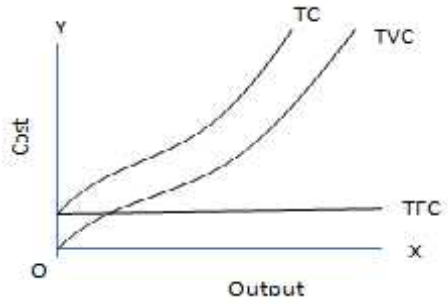
(ii) As the level of output increases, total cost also increases due to increase in variable cost

(iii) TFC is horizontal to x axis.

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

(v) At zero level of output TC is equal to TFC.

(vi) TC and TVC curves parallel to each other.



Q4. Distinguish between explicit cost and implicit cost.

Ans. **Explicit cost**: Actual payment made on hired factors of production. It is opportunity cost of purchasing inputs from the market. 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. It is opportunity cost of using self owned inputs. For example, interest on owners capital, rent of own building, salary for the services of entrepreneur etc.

Q5. Complete the following table:

Unit (Output)	Average Variable Cost(Rs.)	Total Cost (Rs.)	Marginal Cost (Rs.)
1	-	50	20
2	18	-	-
3	-	-	18
4	20	110	-
5	22	-	-

Sol.

Unit (Output)	**AVC**	**TC**	**MC**	**TVC**	**TFC**
1	20	50	20	20	30
2	18	66	16	36	30
3	18	84	18	54	30
4	20	110	26	80	30
5	22	140	30	110	30

Q6. The Following table shows the MC at different levels of output by a firm. Its TFC is Rs. 120. Find ATC and AVC at each level of output.

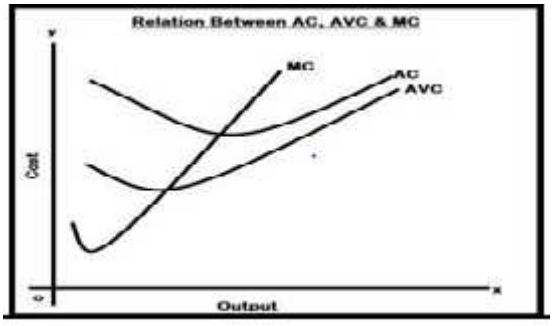
Output	**1**	**2**	**3**
Marginal cost	**40**	**30**	**26**

SOL.

Output	MC	TFC	TVC	TC	**ATC**	**AVC**
0	-	120	0	120	**-**	**0**
1	40	120	40	160	**160**	**40**
2	30	120	70	190	**95**	**35**
3	26	120	96	21	**72**	**32**

Q7. Draw average total cost, average variable cost and marginal cost curve in a single diagram.

Ans: single Diagram of ATC (AC), AVC and MC



SHORT & LONG ANSWER TYPES QUESTION (CBSE OARD)

Q1. Complete the following table : (Delhi 2013)

Output	Average cost	Marginal cost
1	12	-
2	10	-
3	-	10
4	10.5	-
5	11	-
6	-	17

Q2. With increase in level of output, average fixed cost goes on falling till it reaches Zero. Is it true? Give reason for your answer.(AI 2013)

Q3. Explain the relationship between marginal cost and average variable cost. (F 2013)

Q4. Explain the relationship between marginal cost and average cost. (F 2013)

Q5. Show with the help of a numerical example that average cost is constant when marginal cost equal

to it . (F2013)

Q.6. What is the behavior of average fixed cost as a output is increased? Why is it so? (Delhi 2014)

Q7. State the relationship between total cost and marginal cost. (Delhi 2014)

Q8.What is the behavior of (a) average fixed cost, and (b) average variable cost as more and more unit of good are produced? (AI 2015)

Q9.What is relationship between marginal cost and average variable cost when marginal cost is rising and average variable cost is falling? (01 marks Delhi 2016)(V.I.in AI 2017)

Q10. Define cost. Distinguish between fixed and variable cost. Give one example of each. (Delhi 2016)

Q11. Define fixed cost. Give example. Explain with reason the behavior of average fixed cost as output is increase. (AI 2016)

Q12. Define cost. State the behavior of (a) total fixed cost, and (b) total variable cost as output is increased. (F 2016)

Q13. A producer starts a business by investing his own saving and employs a manager to look after it.

Identify implicit and explicit cost form this information. Also, give reasons.

Q14. With the help of suitable diagram, explain the relationship between TC, TFC and TVC.

Q15. Draw average total cost, average variable cost and marginal cost curve in a single diagram.

Q16. State whether the following statement are true or false. Give reason for your answer:

(i) Average cot can fall even when marginal cost is rising.
(ii) The difference between average total cost and average variable cost is consent.
(iii) As output is increased, the difference between average total cost and average variable cost falls and ultimately becomes zero.
(iv) AVC can fall only when MC is falling.
(v) The difference between total cost and total variable cost rises with increase in output.
(vi) When MC rises, AVC also rises.

CONCEPT OF REVENUE

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

Revenue = Cost + Profit (Profit= Revenue – Cost)

TOTALREVENUE, MARGINAL REVENUE AND AVERAGE REVENUE

Total Revenue: 'TR refers to money receipts of a firm from the sale of its total output'.

TR = Quantity sold × Price (or) output sold × price

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

MR is the change in the total revenue on account of the sale of an additional unit of output.

$MR = TR_n - TR_{n-1}$ $MR_n = \Delta TR / \Delta Q$

$TR = \sum MR$

Average Revenue: AR is the per unit revenue received from the sale of a commodity. It is same as price of the commodity.

AR = TR / Output sold

AR and price are the same.

TR = Quantity sold × price OR output sold × price

AR and price are the same - TR = Quantity sold × price or output sold × price.

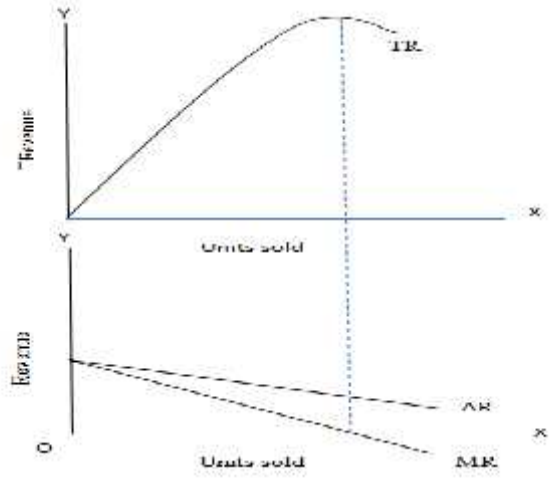
AR = (output / quantity × price) / Output/ quantity. AR= price. AR and demand curve are the same. Shows the various quantities demanded at various prices.

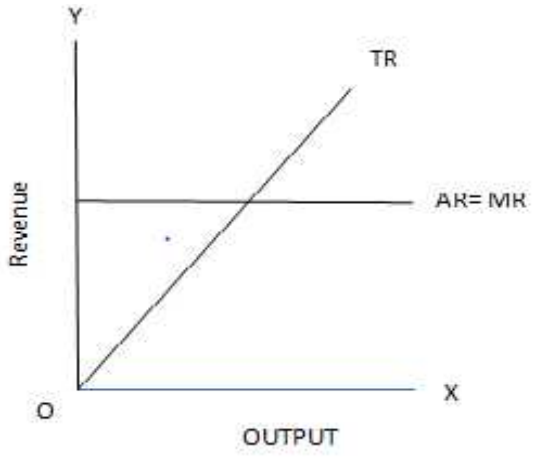
TR,MR,AR WHEN PRICE NOT CONSTANT

Output/Sales/ Q Units	AR Price	TR	MR
1	10	10	10
2	9	18	8
3	8	24	6
4	7	28	4

TR,MR,AR WHEN PRICE CONSTANT

Output/Sales/ Q Units	AR Price	TR	MR
1	10	10	10
2	10	20	10
3	10	30	10
4	10	40	10





Complete the following table

Output(Units)	**TR**	**MR**	**AR**
1	**-**	**-**	**8**
2	**-**	**4**	**-**
3	**12**	**-**	**4**
4	**8**	**-**	**2**

Relationship between TR and MR :- (1) When TR is increasing at constant rate, MR should be constant. It happens under perfect competition.

When TR is increasing at diminishing rate, MR should be diminishing. It happens under Monopoly and Monopolistic competition.

When TR is maximum, MR is zero

When TR is diminishing, MR is negative.

Relationship between AR and MR :- (1) When AR is decreasing, MR should be decreasing faster than AR. Thus, downward sloping MR curve is below the downward sloping AR curve. Accordingly, MR<AR.

(2)If AR is constant, MR is equal to AR. Both are indicated by the same horizontal straight line.

MR can be negative, but not AR.

FIRM'S REVENUE CURVE IN DEFFERENT MARKET

Perfectly Competitive Market

Monopoly market

Monopolistic Competitive Market

Revenue Curve Under Competitive Market

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)

Output/Sales/ Q Units	AR Price	TR	MR
1	10	10	10
2	10	20	10
3	10	30	10
4	10	40	10

Revenue Curve Under Perfectly Monopoly: (i) Under monopoly, the firm's AR curve slop downward from left to right.

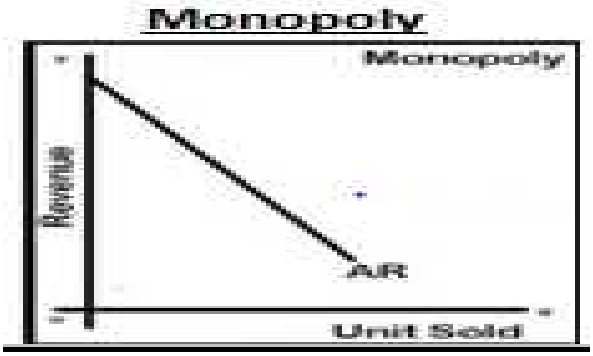
(ii) Monopolist desires to sell more, he has to reduce price of the product.

(iii)Monopolist is a price maker

Firm's AR curve slopes downward.

Table: **Revenue Curve Under Monopoly**

Output/Sales/ Q Units	AR Price	TR	MR
1	10	10	10
2	9	18	8
3	8	24	6
4	7	28	4

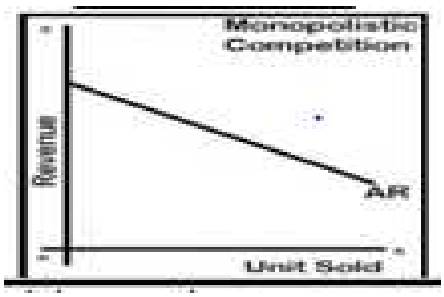


Revenue Curve Under Monopolistic Competition :- (i) Under monopolistic competition, the firm's AR curve slop downward from left to right.

(ii) Under monopolistic competition, AR curve is more elastic.

(iii)It is because in a monopolistic competitive market, goods have close substitutes.

Output/Sales/	AR Price	TR	MR
1	10	10	10
2	9.5	19	9
3	9	27	8
4	8.5	34	7



MCQ

Q1.AR is always equal to _____

(a) Revenue (b) Cost

(c)Price (d) Profit

Q2.Margianl revenue is defined as :

(a)Revenue per unit of commodity

(b)Addition to revenue when one more unit of the commodity is sold

(c)Proceeds from the sale of the commodity

(d)All of these

Q3.Average revenue is defined as

(a)Revenue per unit of commodity

(b) Addition to revenue when one more unit of the commodity is sold

(c) Proceeds from the sale of the commodity

(d)All of these

Q4.When AR falls, MR. will be ;

(a)Falls (b) Rises

(c)Zero (d) Constant

Q5.What will be the position of TR when MR is zeros;

(a)Maximum (b)Minimum

(c)Zero (d) Constant

Q6. When TR be a horizontal Straight line, MR will be?

Maximum (b) Minimum

(c) Constant **(d))Zero**

Q7. If all units are sold at same price how will it affect AR and MR at all level ?

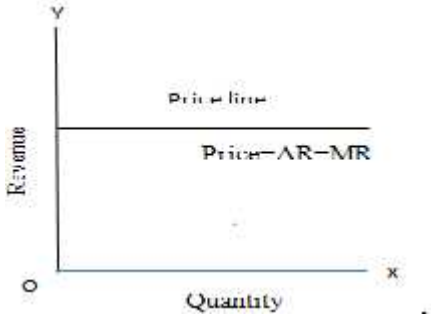
(a) AR = MR (b) AR > MR

(c)AR < MR (d) None of these

SHORT & LONG ANSWER TYPES QUESTION

Q1. Under which market form a firm's marginal revenue is always equal to price?

Ans: Under perfect competition market firm's marginal revenue curve always equal price , because 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)



Output/Sales/ Q Units	AR Price	TR	MR
1	10	10	10
2	10	20	10
3	10	30	10
4	10	40	10

Q2. State the relationship between Total revenue and marginal revenue

Ans. Relationship between TR and MR :- (1) When TR is increasing at constant rate, MR should be constant. It happens under perfect competition.

When TR is increasing at diminishing rate, MR should be diminishing. It happens under Monopoly and Monopolistic competition.

When TR is maximum, MR is zero

When TR is diminishing, MR is negative.

Q3. Draw marginal revenue and average revenue curve in a single diagram of a firm which can sell more units of a good only by lowering the price of that good.

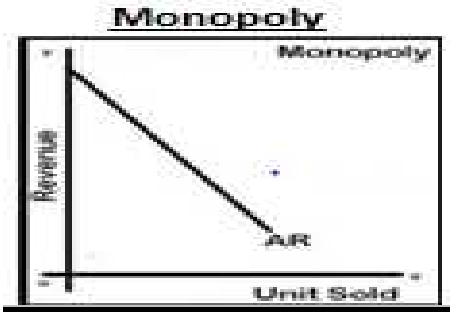
Ans: Represent AR and MR curves of a firms which are downward sloping, it means that the seller intends selling more unit of the commodity, hi will have to lower the price. Such situation are found when there is monopoly and monopolistic competition in the market.

Revenue Curve Under Monopoly: (i) Under monopoly, the firm's AR curve slop downward from left to right (ii) Monopolist desires to sell more, he has to reduce price of the product.

(iii)Monopolist is a price maker (iv) Firm's AR curve slopes downward.

Table: Revenue Curve Under Monopoly

Output/Sales/ Q Units	AR Price	TR	MR
1	10	10	10
2	9	18	8
3	8	24	6
4	7	28	4

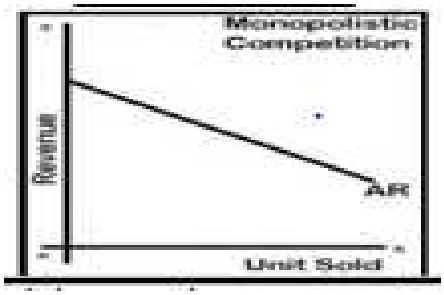


Revenue Curve Under Monopolistic Competition :- **(**i) Under monopolistic competition, the firm's AR curve slop downward from left to right.

(ii) Under monopolistic competition, AR curve is more elastic.

(iii)It is because in a monopolistic competitive market, goods have close substitutes**.**

Output/Sales/ Q Units	AR Price	TR	MR
1	10	10	10
2	9.5	19	9
3	9	27	8
4	8.5	34	7



Q4. State whether the following statement are true or false. Give reason for your answer:

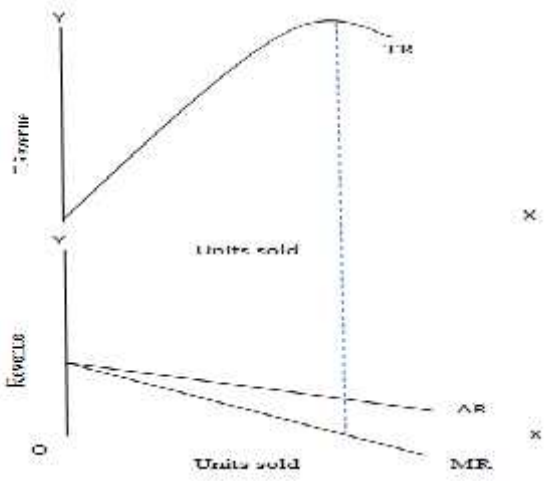
(i) When marginal revenue is Zero, average revenue will also be zero .
(ii) Marginal revenue is the price at which the last unit of a commodity is sold.
(iii) When total revenue is maximum, marginal revenue will also be maximum.
(iv) When marginal revenue fall to Zero , average revenue should be rising.

Ans:- (i) False. We know that when MR = 0, TR is maximum. We also that, AR = TR/Q. Thus, when TR is maximum, AR cannot be Zero at any level of output.(Diagram)

(ii)False. MR is not the price at which last unit of the commodity is sold. MR is simply additional revenue accruing to the firm when an additional unit of output is sold.(Diagram)

(iii)False. When total revenue is maximum, marginal revenue is equal to zero (Diagram)

(iv)False. When MR is zero, AR should be diminishing. (diagram)



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UNIT-3 THEORY OF SUPPLY

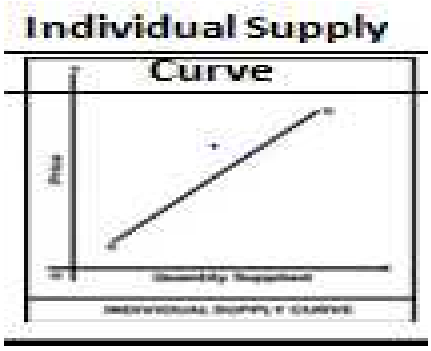
SUPPLY – It is that quantity of a commodity which a seller or producer is ready to sell in the market at a certain price within a given time period.

INDIVIDUAL SUPPLY – It refers to quantity of a commodity that an individual firm is willing and able to offer for sale in the market at a given price per time period.

INDIVIDUAL SUPPLY SCHEDULE - It is a table showing various level of quantity of a product that an individual producer is willing to sell corresponding to each given level of price.

Price (Px)	Qx Supply
10	5
20	10
30	15

INDIVIDUAL SUPPLY CURVE : Individual Supply curve is a graphic presentation of supply schedule of an individual firm in the market.

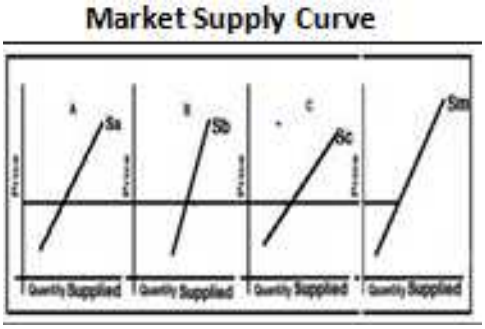


MARKET SUPPLY - It refers to the aggregate quantity of a commodity that all the firms are willing and able to offer for sale together at each possible price during a given period of time.

MARKET SUPPLY SCHEDULE - It is table showing various level of quantity of a product that all the firm together offer to sale at each level of price.

Price (Px)	Qx Firm A	Qx Firm B	Qx Firm C	Market Supply
10	5	0	10	15
20	10	5	15	30
30	15	10	20	45

MARKET SUPPLY CURVE : Market Supply curve is a graphic presentation of supply schedule .



SUPPLY FUNCTION(Determinants og supply) :- $Sx = f(Px, Pr, N_F, G, P_F, T, E_X, G_P)$

1. **Own price of a commodity(Px)**:- Direct relationship between own price of commodity and its quantity supplied. Higher the price, higher the quantity supplied, and lower the price lower the quantity supplied.
2. **Price of related goods(Pr)** Supply of a goods depends upon the price of related goods. Consider a firm selling tea, if price of coffee rises in the market, the firm will be willing to sale less tea at its existing price. vice versa.

3. **Number of firms in the industry(N_F):-** Market supply of a commodity depends upon number of firms in the industry. Increase in the number of firm implies increase in market supply. vice versa.

4. **Goal of the firm** :- If goal of the firm is to maximise profits, more quantity of the commodity will be offered only at higher price vice versa.

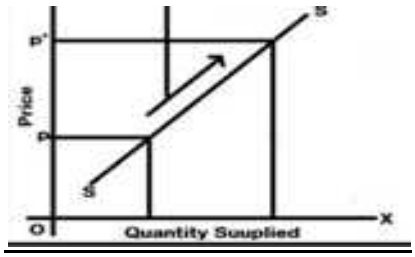
5. **Price of factor product (P_F):-** If the factor decreases, cost of production also reduces. According, more of the commodity is supplied at its existing price. vice versa.

6. **State of technology(T) :** Improvement in the technique of the production reduces cost of production. Consequently, more of the commodity is the supplied at its existing price.

7. **Government policy:-** Taxation and subsidy policy of the government also impacts market supply of the commodity. Increase in taxation may decrease supply, while increase in subsidies may increase it.

LAW OF SUPPLY:- The law of supply states that other things remaining constant, quantity supplied increase with increases with increase in own price of a commodity and vice versa.

Price Px	Sx Unit
10	5
20	10
30	15



Assumptions of the law of supply:

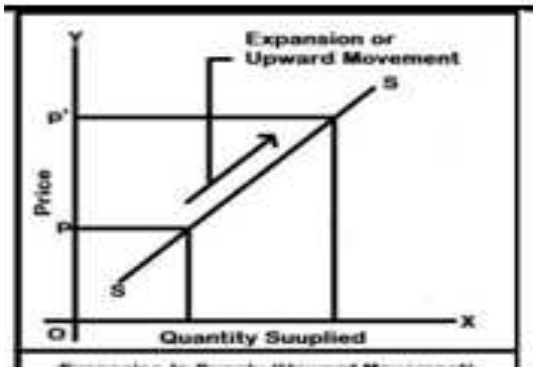
(i) There is no change in the price of the factors of production
(ii) There is no change in the technique of production
(iii) There is no change in the goal of the firm
(iv) There is no change in the price of related goods
(v) There is no change in the price of commodity in near future

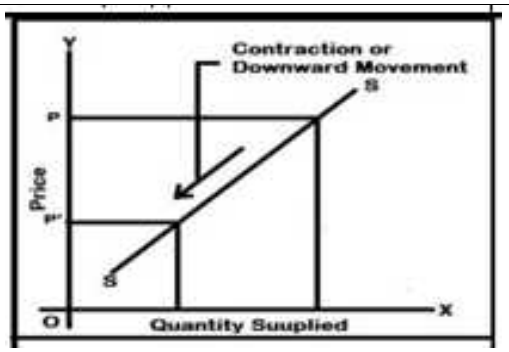
CHANGE IN QUENTITY SUPPLED AND CHANGE IN SUPPLY

CHANGE IN QUENTITY SUPPLY OR MOVMENT ALONG A SUPPLY:- Change own price of the commodity, its quantity supplied changes. Quantity supplied of a commodity due to rice in its own price is called extension of supply and decrease in quantity supplied due to fall in its own price is called contraction of supply.

Extension of supply	Contraction of supply
1. When there is rise in supply due to rise in Price of its own.	1. When there is fall in supply due to fall in Price of its own.
2.In this situation producer move upward on the same demand curve	2.In this situation consumer move downward on the same supply curve.
3.Law of supply is applicable	3. Law of supply is applicable
4.More is supplied at more prices other things	4. Less is supplied at less prices other things

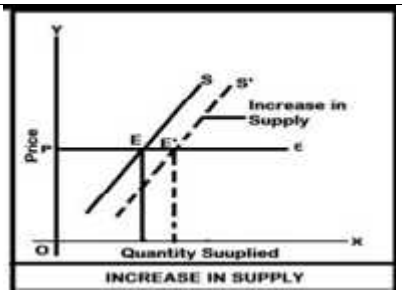
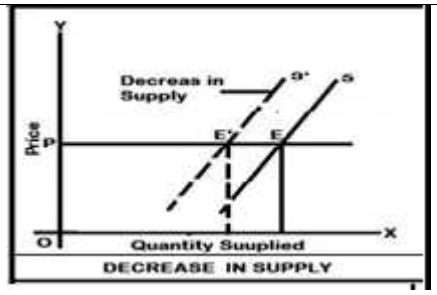
being equal.	being equal.
5.It is known as "Change in Quantity Supplied"	5.It is known as "Change in Quantity Supplied"





Extension of supply			Contraction of supply	
Px	**Qx Unit**		**Px**	**Qx Unit**
10	**5**		**20**	**10**
20	**10**		**10**	**5**

CHANGE IN SUPPLY(Increase and Decrease in Supply):- When supply of a commodity changes do to factors other than its own price, such as change in expectations, technology or goal of the firm then it is called increase or decreases in supply.

Increase in Supply	**Decrease in Supply**
1. When rise in supply due to fall in price of inputs, rise in price of related Goods, Increase in Excise duty, Up gradation in technology etc.	1. When decrease in supply due to De gradation in Technology, Rise in Price of Inputs, Increase in Excise Duty or tax ,Rise in the Price of Related Goods etc.
2. In this situation supply curve shift rightward.	2. In this situation supply curve shift leftward.
3. More is supplied at same price and same is supplied at fewer prices.	3.Less is supplied at same price and same is supplied at more prices.
4. It is known as "Change in Supply"	4. It is known as "Change in Supply"
	

Px	Qx
10	5
10	10

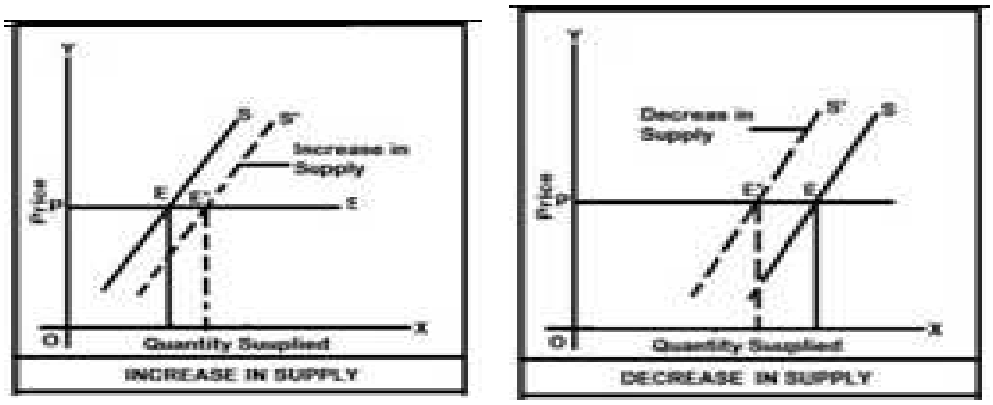
Px	Qx
10	10
10	5

Causes of Increase in Supply(Reasons for Rightward Shift)

1. Decrease in Price of Substitute Goods
2. Increase in Price of Complementary Goods
3. Decrease in Price of Factors (Input)
4. Improvement in Technology
5. Expectation in fall in Price in Future;
6. Increase in Number of firms
7. Good Transport and Communication
8. Goal of Sale Maximization
9. Decrease in Taxes

Causes of Decrease in Supply (Reasons for Leftward Shift)

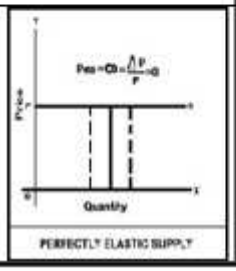
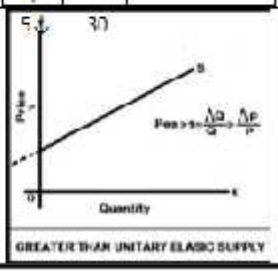
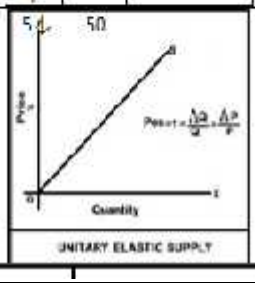
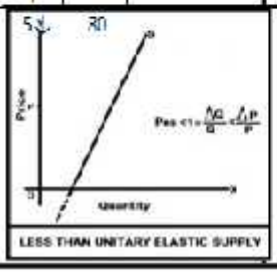
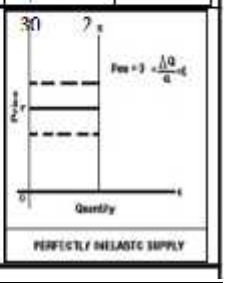
1. Increase in Price of Substitute Goods
2. Decrease in Price of Complementary Goods
3. Increase in Price of Factors (Input)
4. Degrade in Technology
5. Expectation in Rise in Price in Future;
6. Decrease in Number of firms
7. Poor Transport and Communication
8. Goal of Profit Maximization
9. Increase in Taxes



PRICE ELASTICITY OF SUPPLY

Elasticity of supply refers to the degree of responsiveness of a commodity with reference to a change in price of such commodity. It is always positive due to direct relationship between price and quantity supplied.

$$\text{Elasticity of supply} = \frac{\text{Percentage Change in quantity supplied}}{\text{Percentage Change in price}}$$

Perfectly elastic supply ($P.e_s=\infty$) - When the supply becomes zero with a slight rise in price or when the supply is infinite with slight fall in price.	More than Unitary Elastic ($P.e_s>1$) - When proportionate change in quantity supplied is more than proportionate change in price, it is said to be more than unitary elastic supply.	Unitary elastic Supply ($P.e_s=1$) - When proportionate change in quantity supplied is equal to proportionate change in price, then it is said to be less than unitary elastic supply.	Less than unitary elastic supply ($P.e_s<1$) - When the proportionate change in quantity supplied is less than proportionate change in price, then it is said to be less than unitary elastic supply.	Perfectly inelastic supply ($P.e_s=0$) - When there is no change in quantity supplied with the change in its price, it is perfectly inelastic supply.
P. Q.S. $P.e_s$ 10 2 10 4 10 6 =0	P Q.S. $P.e_s$ 10 100 15 200	P. Q.S. $P.e_s$ 10 100 15 150	P. Q.S. $P.e_s$ 10 100 15 120	P. QS $P.e_s$ 10 2 20 2
				

FACTORS AFFECTING ELASTICITY OF SUPPLY

LESS ELASTIC SUPPLY	FACTORS	HIGH ELASTIC SUPPLY
Perishable Goods – Vegetables, Milk	NATURE OF COMMODITY	Durable Goods – TV, furniture
Short Period	TIME PERIOD	Long Period
Complex Techniques	TECHNIQUES OF PRODUCTION	Simple Techniques
Influenced by Natural Constraints	NATURAL CONSTRAINTS	Do not have Natural Constraints
Producers Not Willing to take Risk	RISK TAKING	Producers Willing to Take Risk
Specialized Factors	NATURE OF INPUTS USED	Common Factors
Law of Increasing Cost	COST OF PRODUCTION	Law of Diminishing Cost

MCQ

Q1.The rise in supply due to rise in price is called

(a) Increase in supply (b)Decrease in supply

(c) Extension of supply (d) None of these

Q2.When supply curve is upward sloping, its slope is:

(a) Positive (b) Negative

(c) First positive then negative (d)Zero

Q3.Market supply curve is _____ sum of individual supply curve.

(a) **Horizontal** (b)Vertical

(c) Can be both horizontal or vertical (d) None of these

Q4.Movement along a supply curve is also called:

(a)Change in supply **(b) Change in quantity supplied**

(c) Contraction in supply (d) Increase in supply

Q5.A upward movement along a supply curve shows;

(a)Contraction in supply (b) Decrease in supply

(c) Expansion in supply (d) Increase in supply

Q6.A rightward shift in supply curve shows

(a)Contraction in supply (b) Decrease in supply

(c) Expansion in supply **(d)Increase in supply**

Q7.When same quantity is supplied at a higher price, it shows:

(a)Contraction in supply **(b) Decrease in supply**

(c) Expansion in supply (d) Increase in supply

Q8. When supply curve is vertical, Es_____?

(a) Zero (b) 1

(c) Infinite (d) Ed less than 1

Q9 When supply curve is horizontal, Es= -------?

(a) Zero (b) 1

(c) Infinite (d)Ed is more than unitary

Q10. If 16% rise in price causes 40% increase in supply, elasticity of supply will be:

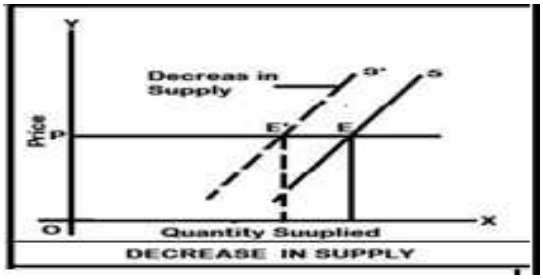
(a) 1.5 (b) 2.0

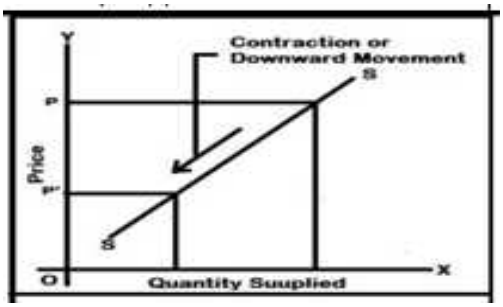
(c) 2.5 (d) 3.5

SHORT & LONG ANSWER TYPES QUESTION

Q1. Explain the distinction between 'decrease in supply' and 'contraction of supply'. Use diagrams.

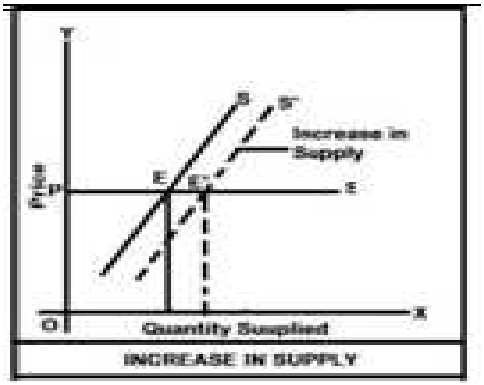
Decrease in Supply	Contraction of supply
1. When decrease in supply due to De gradation in Technology, Rise in Price of Inputs, Increase in Excise Duty or tax ,Rise in the Price of Related Goods etc.	1. When there is fall in supply due to fall in Price of its own.
2. In this situation supply curve shift leftward.	2.In this situation consumer move downward on the same supply curve.
3.Less is supplied at same price and same is supplied at more prices.	3. Law of supply is applicable
4. It is known as "Change in Supply"	4. Less is supplied at less prices other things being equal. It is known 'Change in quantity supply.





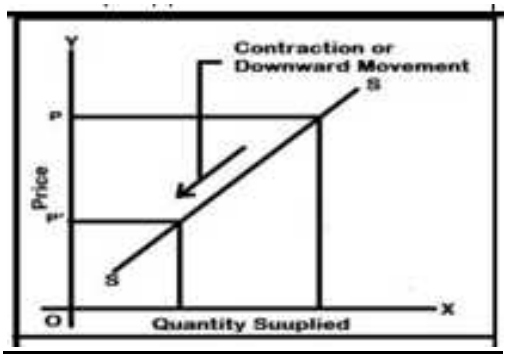
Q2. Explain how technological progress is a determinant of supply of a good by a firm.

Ans. When technological progress on the production of good, Marginal and Average cost of the production tends to fall, Accordingly, producers will supply at the same price or same supply at the lower price. This implies a forward or rightward shift supply curve.

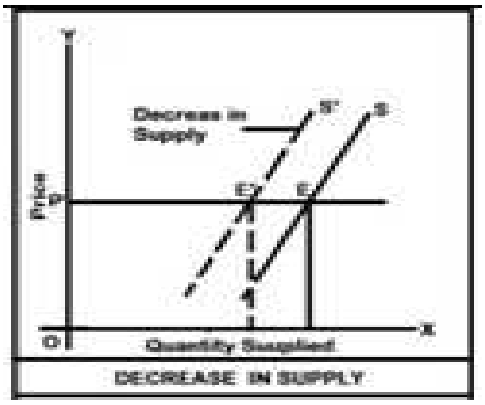


Q3.Examine the effect of (i) fall in the own price of a good X, and (ii) rise in tax rate on Good X, on the supply curve. Use diagram.

Ans:- (i) Fall in the price of a good – X leads to downward movement along the supply curve, other things remaining constant as diagram:



(ii)With rise in tax rate on Good – X , marginal and average costs the production tend to rise, Other things remaining constant, it causes a cut in profit. Accordingly, only at a higher price. This implies a backward or leftward shift in supply curve or decreases in supply Diagram:-



DECREASE IN SUPPLY

Q4. **A producer supplies 80 units of good at a price of Rs.10 per unit. Price elasticity of supply is 4. How much will he supply at Rs. 9 per unit?**

Ans : Price elasticity of supply $E_s = \frac{\Delta Q}{\Delta P} X \frac{P}{Q}$

4 = 10/80 x (x – 80) / - 1

4 = (x-80) / - 8

-32 = (x-80)

X = 80 – 32 = 48 Units

Q5. Price elasticity of supply of a commodity is 2 . A firm supplies 100 units of good at a price of Rs.20 per unit. At what price will he supply 80 units?

Ans:- Price elasticity of supply $E_s = \frac{\Delta Q}{\Delta P} X \frac{P}{Q}$

2 = 20 / 100 * -20/(x – 20)

2 = - 4 / x-20

-2 = x – 20

X = 20-2 = 18

The producer will supply 80 units at Rs. 18

Q6. A firm supplies 10 units of good at a price ofRs.5 per unit. Price elasticity of supply is 1.25. What quantity will the firm supply at a price of Rs. 7 per unit?

Ans**:** Price elasticity of supply $E_s = \frac{\Delta Q}{\Delta P} X \frac{P}{Q}$

1.25 = 5/10 * (x-10) /2

1.25 = (x-10)/ 4

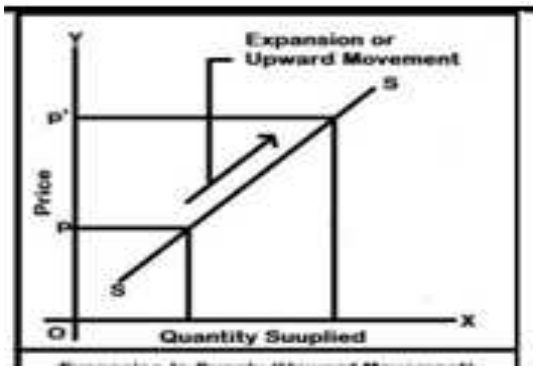
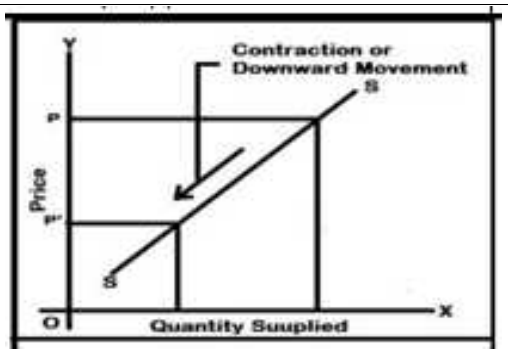
X – 10 = 5

X = 5 + 10 = 15

New quantity = 15 units

Q7.Distinction between Extension of supply and Contraction of supply. Use diagram

Extension of supply	Contraction of supply
2. When there is rise in supply due to rise in Price of its own.	2. When there is fall in supply due to fall in Price of its own.
2.In this situation producer move upward on the same demand curve	2.In this situation consumer move downward on the same supply curve.

3.Law of supply is applicable	3. Law of supply is applicable
4.More is supplied at more prices other things being equal.	4. Less is supplied at less prices other things being equal.
5.It is known as "Change in Quantity Supplied"	5.It is known as "Change in Quantity Supplied"
	

SHORT & LONG ANSWER TYPES QUESTION (CBSE OARD)

Q1.A firm's revenue rises from Rs. 400 to Rs. 500 when the price of its products rises from Rs 20 per unit to Rs. 25 per unit. Calculate the price elasticity of supply. (Delhi 2013)

Q2.When the price of good rises from Rs. 20 per unit to Rs. 30 per unit, the revenue of the firm producing this good rises from Rs. 1000 to Rs. 3000. Calculate the price elasticity of supply. (Delhi 2013)

Q3. The price elasticity of supply of a good is 0.8. Its price rises by 50 per cent. Calculate the percentage increase in its supply. (Delhi 2013)

Q4. A firm supplies 10 units of good at a price ofRs.5 per unit. Price elasticity of supply is 1.25. What quantity will the firm supply at a price of Rs. 7 per unit? (AI 2013)

Q.5 Price elasticity of supply of a commodity is 2.0. A firm supplies 200 units of it at a price of Rs.8 per unit. At what price will it supply 250 units? (AI 2013)

Q6. A 15 per cent rises in price of a commodity raises its supply from 300 units to 345 units. Calculate its price elasticity of supply. (AI 2013)

Q7. Explain the distinction between 'decrease in supply' and 'contraction of supply'. Use diagrams. (F2013)

Q8 . Explain the distinction between 'movement along the supply curve' and 'shift of supply curve' (change in quantity supplied and change in supply). Use diagrams. (F2013 & Delhi 2016)

Q9. Price elasticity of supply of a commodity is 2, what percentage should its price rise so that its supply rises by 30 per cent ? (F 2013)

Q10. Explain how technological progress is a determinant of supply of a good by a firm.(AI 2014,F 2015)

Q11. Explain how input price are a determinant of supply of a good by a firm.(AI 2014)

Q12. How does change in per unit tax influence the supply of a good by a fir? Explain.(F 2014)

Q13. What is change in supply? Explain the effect of tax imposed on a good on the supply of the good. (F 2015)

Q14. Explain the significance of minus sign attached to the measure of price elasticity of demand in case of normal good , as compared to the plus sign attached to the measure of price elasticity of supply ? (AI 2015)
OR Why is(-)minus sign attached to the measure of price elasticity of demand in case of normal good in compared to the plus sign attached to the measure of price elasticity of supply ? Explain. (F 2015)

Q15. A producer supplies 80 units of good at a price of Rs.10 per unit. Price elasticity of supply is 4. How much will he supply at Rs. 9 per unit? (Delhi 2016)

Q16. Price elasticity of supply of a commodity is 2 . A firm supplies 100 units of good at a price of Rs.20 per unit. At what price will he supply 80 units ? (Delhi 2016)

Q17. Examine the effect of (i) fall in the own price of a good X, and (ii) rise in tax rate on Good X, on the supply curve. Use diagram. (AI 2016)

UNIT-4 FORMS OF MARKET

Market refers to all such systems or arrangements that bring the buyers and sellers in contact with each other to settle the sale and purchase of goods. It does not refer to any shopping complex.

Perfect Competition: - It refers to the market situation in which there are large no of buyers and sellers of homogenous product. Price is determined by the industry and only one price prevails in the market.Example – Agricultural Product Market.

Features of Perfect Competition

1. **VERY LARGE NO OF BUYERS AND SELLERS** - (i) As there are large number of sellers' individual seller cannot influence market supply or price. Similarly one buyer cannot affect market demand or price.

(ii) Firms become price takers as they have to accept the equilibrium price that market demand & supply decide. So market or industry is price maker.

(iii) Due to large number of buyers firm can sell any amount of good at equilibrium price. Hence they have perfectly elastic, horizontal Average Revenue (AR) curve.

2. **HOMOGENEOUS PRODUCT -** Perfect competition market has homogenous goods which are same in shape, size, colour, price etc. (I) So it is easy for new firms to enter into and exit from the market. (II) There is no selling cost as there is no need for advertising the good. (III) So one firm cannot effect price market decides the price.

3. **FREE ENTRY AND EXIT -** If in Short Run there is abnormal profit firms will enter the market & if there are abnormal losses firms will exit the market. Hence in the Long run firms will earn Normal Profits.

4. **PERFECT KNOWLEDGE -** Buyers as well as sellers have complete knowledge of the product.

5. **PERFECT MOBILITY OF FACTORS OF PRODUCTION -** There is no geographical restriction on their movement. The factors are free to move to the industry in which they get the best price.

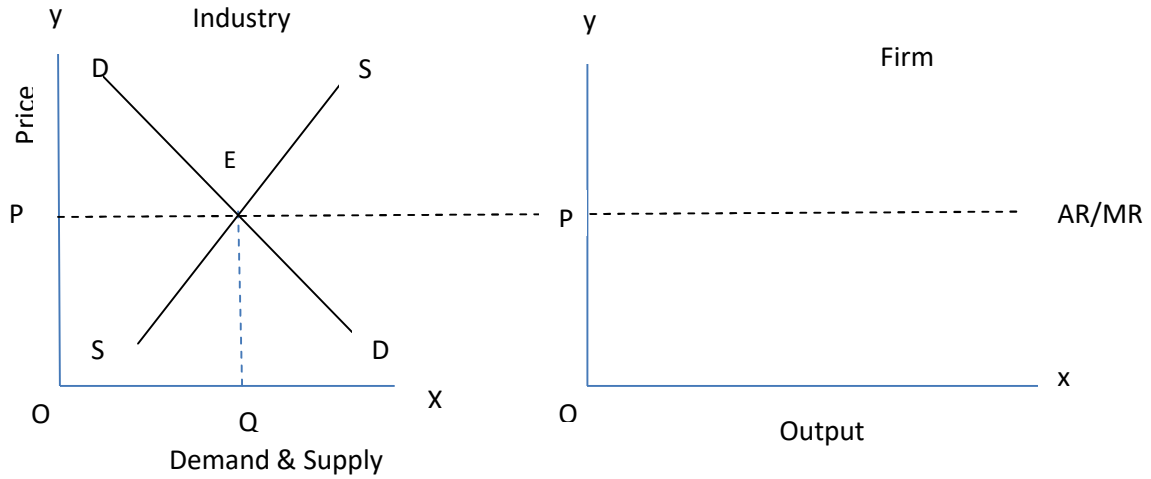
6. **ABSENCE OF SELLING COST - No** advertisement or selling cost is involved because of homogeneous product.

7. **BSENCE OF TRANSPORTATION COST -** No transportation cost is involved in market because sellers and buyers have the perfect knowledge about the market.

PURE COMPETITION- Pure competition is the one which has following features – (i) Large no of buyers and sellers; (ii) Homogeneous Product; (iii) Free from restriction.

Firm under perfect competition is a price taker not a price maker?

A firm under perfect competition is a price taker not a price maker because the price is determined by the market forces of demand of supply. This price is known as equilibrium price. All the firms in the industry have to sell their outputs at this equilibrium price. The reason is that, number of firms under perfect competition is so large. So no firm can influence the price by its supply. All firms produce homogeneous product.



(MONOPOLY, OLIGOPOLY AND MONOPOLISTIC COMPETITION Deleted Year 2021-22 exam By CBSE Board)

MCQ

1. In which kind of market, a firm is a price taker:
(a)Perfect competition (b) Monopoly
(c)Monopolistic Competition (d) Oligopoly

Q2. The period of time, when supply is fully adjusted to change in demand is called
(a)Short period (b) Very short period
(c) Mid-period **(d) Long period**

Q3.Freedom of entry and exit is possible in the:
(a)Short -run **(B) Long -run**
(c)Both (a) and (b) (d) Neither (a) and (b)

Q4.If the demand curve of a individual firm is perfectly elastic, then
(a) **Firm is a price taker** (b)Firm can influence the price
(b) Firm is a price maker (d)Firm has partial control over price

SHORT & LONG ANSWER TYPES QUESTION

Q1. Explain any four characteristics of perfect competition market.

Ans:- (i) Large number of buyers and sellers : The number of buyers and sellers are so large in this market that no firm can influence the price.

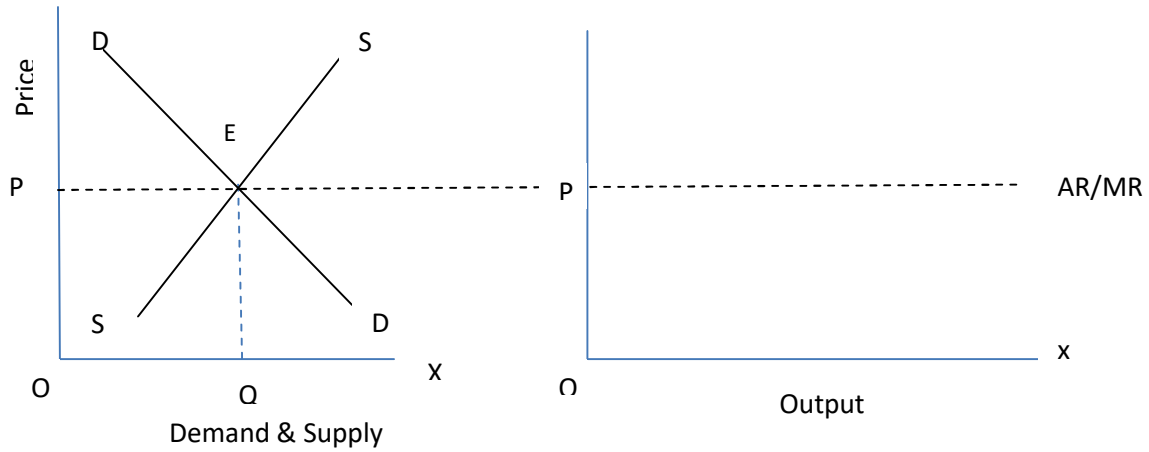
ii) Homogeneous products: Products are uniform in nature. The products are perfect substitute of each other. No seller can charge a higher price for the product. Otherwise he will lose his customers.

iii) Perfect knowledge: Buyers as well as sellers have complete knowledge about the product.

iv) Free entry and exit of firm: Under perfect competition any firm can enter or exit in the market at any time. This ensures that the firms are neither earning abnormal profits nor incurring abnormal losses.

Q2.Explain briefly why a firm under perfect competition is a price taker not a price maker?

Ans:- A firm under perfect competition is a price taker not a price maker because the price is determined by the market forces of demand of supply. This price is known as equilibrium price. All the firms in the industry have to sell their outputs at this equilibrium price. The reason is that, number of firms under perfect competition is so large. So no firm can influence the price by its supply. All firms produce homogeneous product.



Q3. **Explain the implication of the feature 'large number of buyers and sellers' in perfect competition**

Ans: - The number of buyers and sellers is very large under perfect competition market. The number of firms selling a particular commodity is so large that an individual seller contributes only a small part to the market supply. Thus, any increase or decrease in supply by an individual firm hardly impacts the total market supply and consequently, an individual firm cannot influence price of the commodity. Accordingly, like an individual firm, an individual wire is also not able to influence price of the commodity, only normal profits prevail in the long run.

Q4. In a perfectly competitive market the buyers treat products of all the firms as homogeneous. Explain the significance of this feature.

Ans. HOMOGENEOUS PRODUCT:- Perfect competition market has homogenous goods which are same in shape, size, color, price etc.

Feature:- (i) So it is easy for new firms to enter into and exit from the market.

(iii) There is no selling cost as there is no need for advertising the good.

(iii) So one firm cannot effect price market decides the price.

SHORT & LONG ANSWER TYPES QUESTION (CBSE BOARD)

Q1. Explain 'large number of buyers and sellers' feature of a perfectly competitive market. (Delhi2013)

Q2. Why can a firm not earn abnormal profits under perfect competition in the long run? Explain. (AI2013)

Q3. Explain the implication (significance) of large number of buyers in a perfectly competitive market. (F 2014, Delhi 2015)

Q4. There are 'large number of sellers in a perfectly competitive market. Explain significance of this feature. (Delhi 2015)

Q5. In a perfectly competitive market the buyers treat products of all the firms as homogeneous. Explain the significance of this feature. (AI 2015)

Q6. There are no barriers in the way of firms leaving or joining industry in a perfectly competitive market. Explain the significance of this feature. (F2015)

Q7. Explain the implication of the following in a perfectly competitive market: Delhi 2016)

(a) Large number of buyers.
(b) Freedom of entry and exit to firms.
(a) Barriers to entry of new firms.
(b) A few or a big sellers.

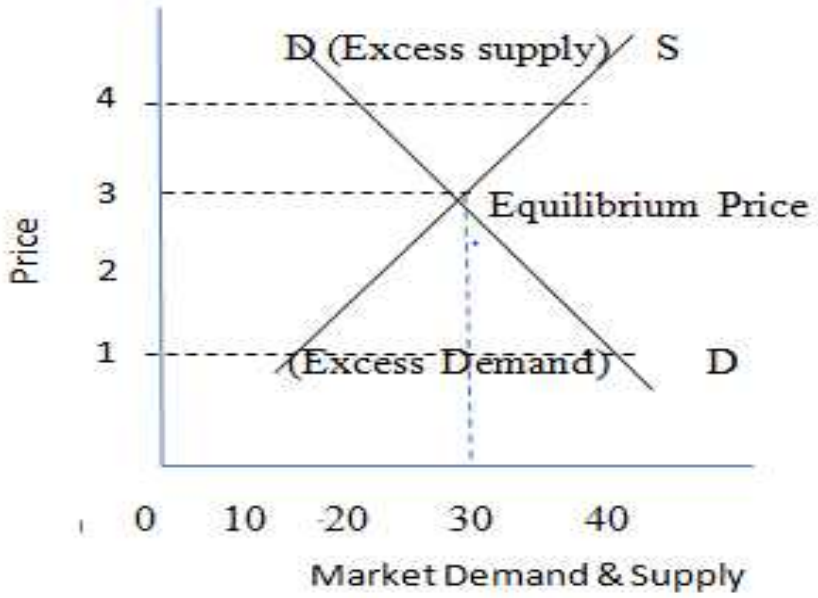
MARKET EQUILIBRIUM UNDER PERFECT COMPETITION

PRICE DETERMINATION: - In a market price of a commodity is decided by the free forces of demand and supply. These free forces of demand and supply act and react in such a manner that the quantity demanded is exactly equal to quantity supplied. In this course price is known as the equilibrium price. Intersection of market demand and market supply curves decides the price of a product.

Market Equilibrium Under perfect competition

Equilibrium price is that price which is determined by market forces of demand and supply. At this price both demand and supply are equal to each other. Diagrammatically it is determined at the point where demand curve and supply curve intersect each other. At this point price is known as equilibrium price and quantity is known as equilibrium quantity.

Price (Rs.)	Quantity Demand (Units)	Quantity Supply(Units)
1	50	10
2	40	20
3	**30**	**30**
4	20	40
5	10	50



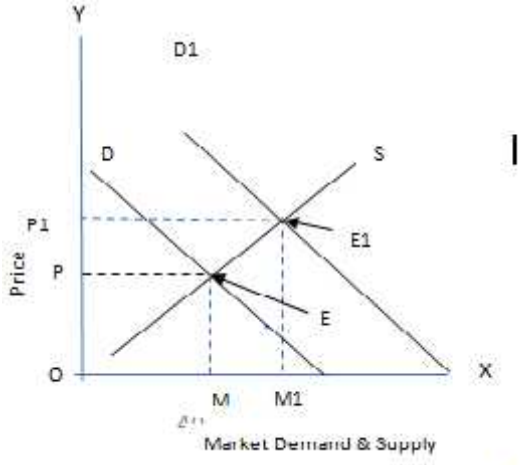
EXCESS DEMAND: - When Excess Demand in the market at a given price, the competition among the buyers to purchase the required quantity. Hence they start offering higher prices. With rising market prices, demand contracts and supply expands. This market adjustment continues till the market reaches equilibrium.

EXCESS SUPPLY: - When Excess Supply in the market at a given price, the competition among the sellers to dispose-of their output. Hence, they start offering lower prices. With fall in the market prices, demand expands and supply contracts. This market adjustment continues till the market reaches equilibrium.

SHIFT (CHANGE) IN DEMAND AND MARKET EQUILIBRIUM

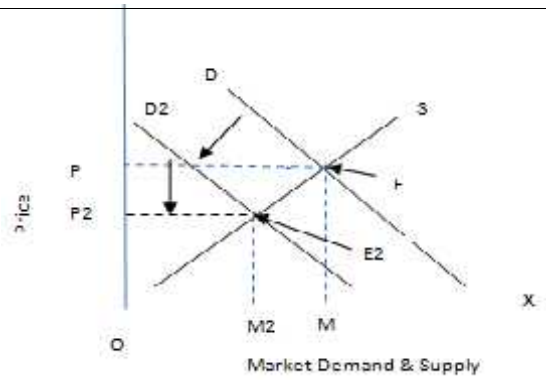
(1) Increase in Demand (2) Decrease in Demand

(1) Increase in Demand:- In case of increase in demand, demand curve shift to the right.



- Increase in demand shift the demand curve from D to D_1 to right leading to excess demand E E_1 at the given price OP.
- There will be competition among buyers leading to rise in price.
- As price rise supply starts rising (along S) demand starts falling.
- These changes continues till D=S at a new equilibrium at E_1
- The quantity rises to OM to OM_1 and price rises OP to OP_1

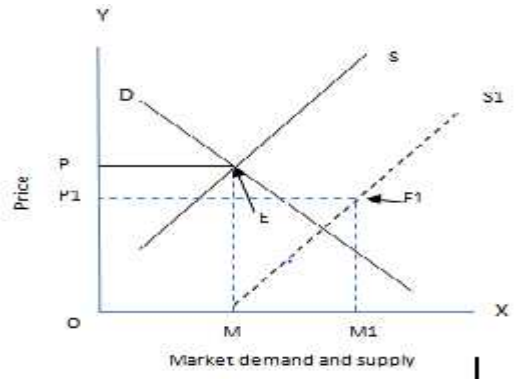
(2) Decrease in Demand:- In case of decrease in demand, demand curve shift to the leftward.



- Decrease in demand shift the demand curve from D to D2 to left leading to decrease demand E E_2 at the given price OP.
- There will be competition among buyers leading to fall in price.
- As price fall supply starts falling (along S).
- These changes continues till D=S at a new equilibrium at E_2
- The quantity fall to OM to OM_2 and price fall OP to OP_2.

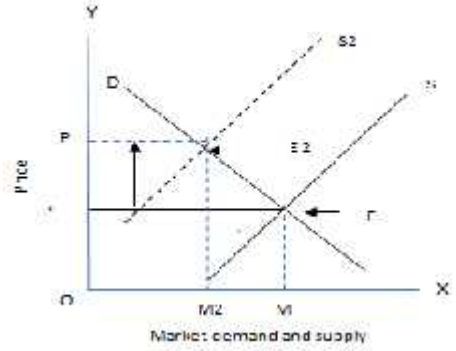
SHIFT (CHANGE) IN SUPPLY AND MARKET EQUILIBRIUM

1. **Increase in supply:-** In case of increase in supply, the supply curve shifts to the right.



- Increase in supply shift the supply curve from S to S_1 to right leading to excess supply E E_1 at the given price OP.
- There will be competition among buyers leading to fill in price.
- As price fall supply starts rising (along D).
- These changes continues till D=S at a new equilibrium at E_1
- The quantity rises to OM to OM_1 and price fall OP to OP_1

2. **Decrease in supply:-** In case of decrease in supply, the supply curve shifts to the leftward.



- decrease in supply shift the supply curve from S to S_2 to left leading to fall supply E E_2 at the given price OP.
- There will be competition among buyers leading to increase in price.

- As price increase supply starts falling (along D).
- These changes continues till D=S at a new equilibrium at E_2
- The quantity fall to OM to OM_2 and price rises OP to OP_2.

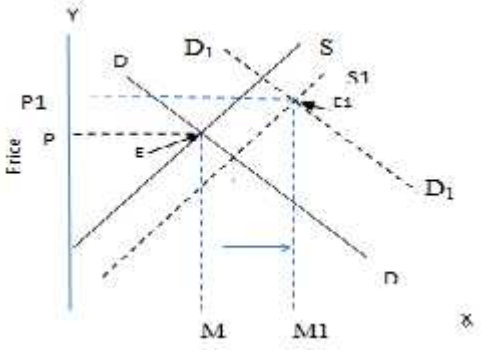
SIMULTANEOUS SHIFT (CHANGE) IN DEMAND AND SUPPLY AND MARKET EQUILIBRIUM

(1) SIMULTANEOUS INCREASE IN DEMAND AND SUPPLY (OR)

Equilibrium price may or may not change with Increases in both demand and supply

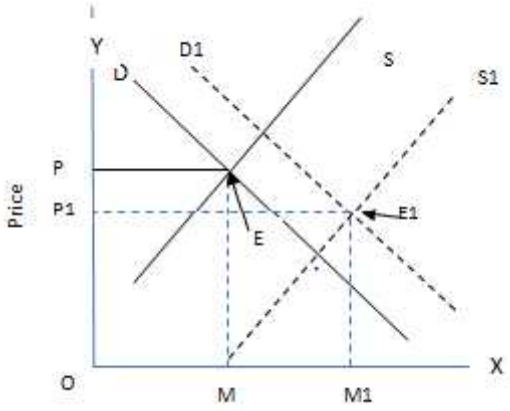
Simultaneous increase in demand and supply must lead to increase in equilibrium quantity of commodity. But change in price depends on whether: (i) Increase in demand > Increase in supply. (ii) Increases in demand < Increases in supply, and (iii) Increases in demand = Increase in supply

(i) Increase in demand > Increase in supply :- When demand increases more than supply price and quantity both will increase



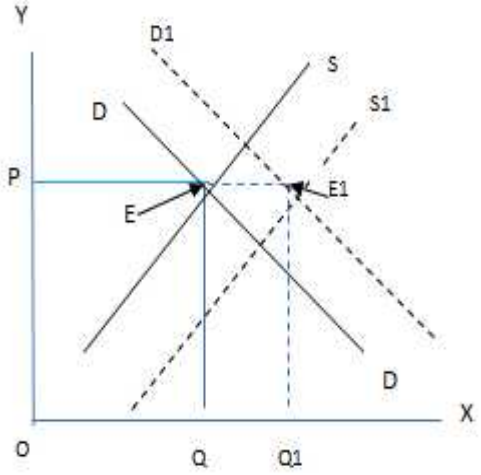
When increase in demand is more than increase in supply price increases from OP to OP1. Quantity increases from OM to OM1. Increase in price is less than increase in quantity.

. **(ii) Increases in demand < Increases in supply:-** When demand increases less than supply, price will fall but quantity will rise



When supply increases more than demand price falls from OP to OP1 and quantity demand increases from OM to OM1. Decrease in price is less than increase in quantity.

(iii) Increases in demand = Increase in supply:- When demand and supply increases equally then equilibrium price remain same.



When increase in demand is equal to increase in supply price remains unchanged at OP. Quantity exchanged increases from OQ to OQ_1.

(2) SIMULTANEOUS DECREASE IN DEMAND AND SUPPLY (OR)

Equilibrium price may or may not change with Decreases in both demand and supply:-

Simultaneous decrease in demand and supply must lead to increase in equilibrium quantity of commodity. But change in price depends on whether: (i) Decrease in demand > Decrease in supply. (ii) Decreases in demand < Decreases in supply, and (iii) Decreases in demand = Decrease in supply

(i) Decrease in demand > Decrease in supply: When demand decreases more than supply, price and quantity both will decrease.

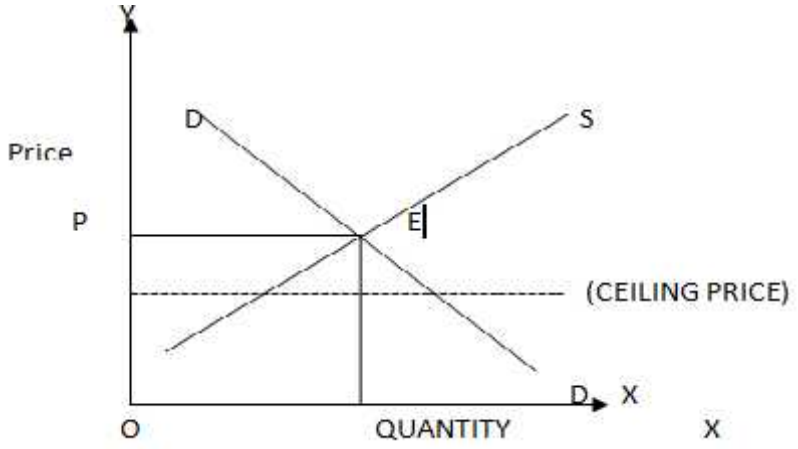
(ii) Decreases in demand < Decreases in supply:- When demand decreases less than supply, price will increases but quantity will rise

(iii) Decreases in demand = Decrease in supply:- When demand and supply decreases equally then equilibrium price remain same but quantity will fall.

SIMPLE APPLICATION OF DEMAND AND SUPPLY

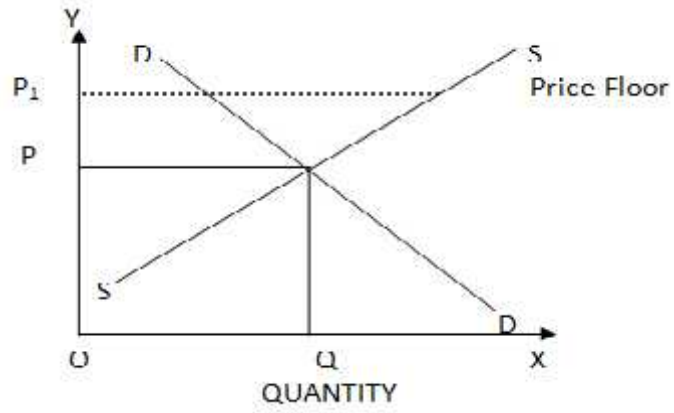
Price ceiling : Price ceiling means maximum price of a product that the sellers can charge from the buyers. Often, the government fixes this price much below the equilibrium market price so that the essential commodities are within the reach of the poorer section of the society . In terms of demand and supply curves, price ceiling means fixing price by the government below the equilibrium price when the equilibrium price is presumed to be too high.

- Price ceiling is generally imposed by the govt. on necessary items wheat, rice, kerosene, sugar, medicines during in times of 'shortages'
- To ensure availability of the product to everyone ration coupons are issued to the buyers so that no individual can buy more than a certain amount of the commodity and this stipulated amount of the commodity is sold through ration shops or fair price shops.



Price floor

- When the government imposed lower limit on the price that they may be charged for the particular commodity is called price floor. In other words price being fined above the equilibrium price.
- Most well-known examples of imposition of price floor are agricultural price support programme and the minimum wage legislation.
- These programmes are meant to insulate farmers and labours from income fluctuations resulting from price variations in the free market.
- Through an agricultural price support programmes, the govt. imposes a lower limit on the purchase price for some of the agricultural goods and the floor is normally set at a higher level than the equilibrium price of these goods.



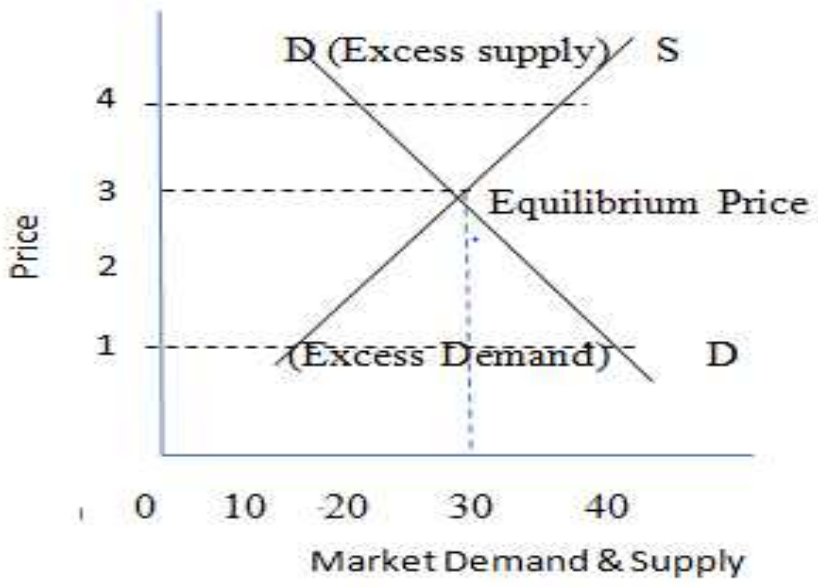
SHORT & LONG ANSWER TYPES QUESTION

Q1. Explain the process of price determination under perfect competition with the help of schedule and a diagram.

Ans:-Equilibrium price is that price which is determined by market forces of demand and supply. At this price both demand and supply are equal to each other. Diagrammatically it is determined at the point where demand curve and supply curve intersect each other. At this point price is known as equilibrium price and quantity is known as equilibrium quantity.

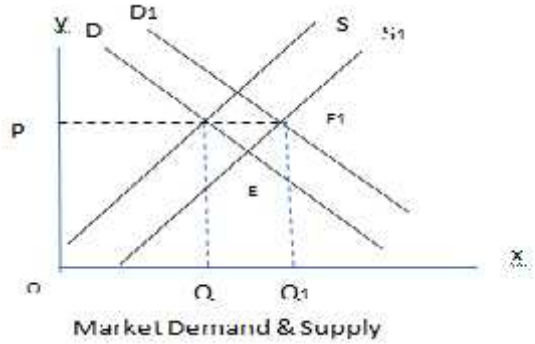
price and quantity is known as equilibrium quantity.

Price (Rs.)	Quantity Demand (Units)	Quantity Supply(Units)
1	50	10
2	40	20
3	**30**	**30**
4	20	40
5	10	50



Q2. **When will equilibrium price not change even if demand and supply increase?**

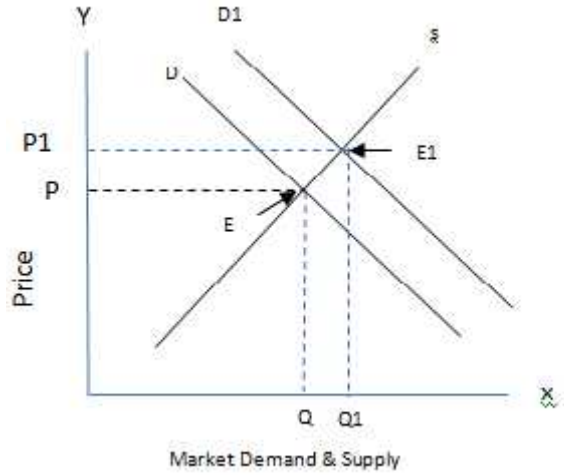
Ans:- When proportionate increase in demand is just equal to proportionate increase in supply. Equilibrium price will not change. It can be shown in the following diagrams.



In the above diagram increase in demand is just equal to increase in supply. Demand curve shift from D to D_1 and supply curve shift from S to S_1 which intersect at point E. Thus equilibrium price remain unchanged at OP though equilibrium quantity increased from OQ to OQ_1.

Q3. **How does increase in price of substitute goods in consumption affect the equilibrium price of a good? Explain with a diagram.**

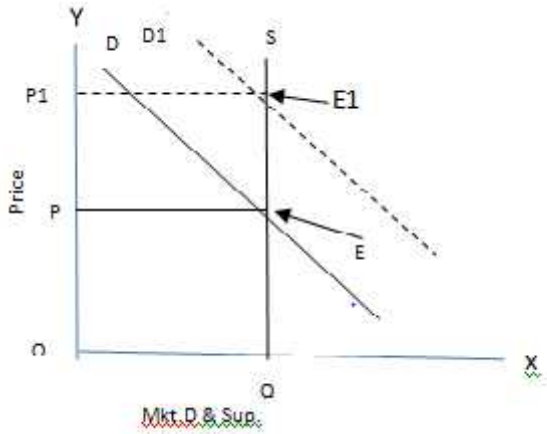
Ans:- An increase in price of substitute goods (coke) will cause increase in demand for its related goods (Pepsi) . The demand curve for Pepsi will shift to the right side. The supply curve of Pepsi remains the same. It will lead to an increase in equilibrium price of Pepsi and increase in quantity also.



Market Demand & Supply

Result: Price increases from OP to OP_1. Quantity demand increases from OQ to OQ_1

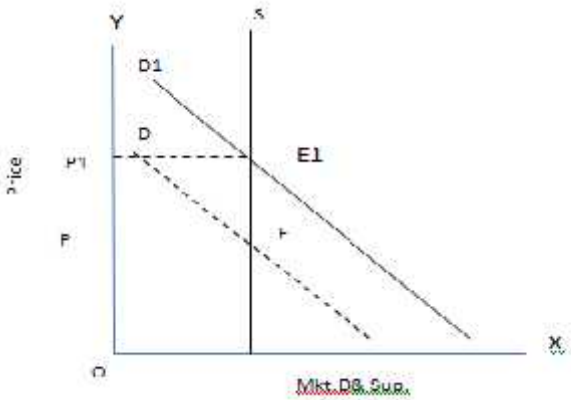
Q4. **Show with the help of diagram the effect on equilibrium price and quantity when supply is perfectly inelastic and demand increases and decreases?**
Ans.



Mkt D & Sup.

When supply is perfectly inelastic and demand increases. Demand curve shift to towards right. The new demand curve D_1 intersects the supply curve at point E_1.

Result : Price increases from OP to OP_1 and quantity demand remains unchanged.



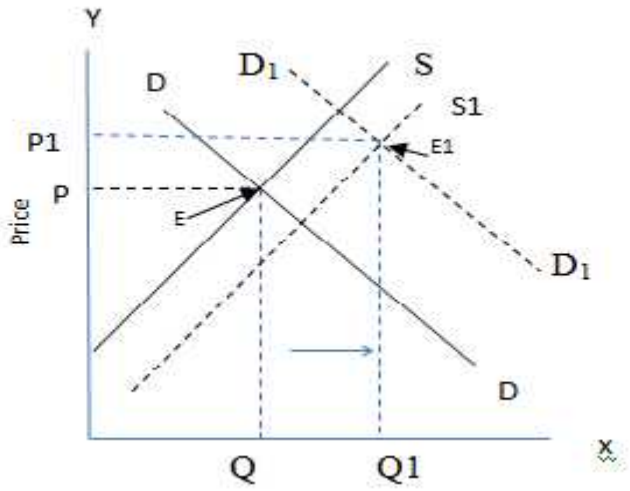
Mkt.DS.Sup.

In the above diagram demand curve shift left wards from D to D_1 Price falls from OP to OP_1 , but quantity remains same.

Q5.Equilibrium price may or may not change with shifts in both demand and supply curve. Comment.

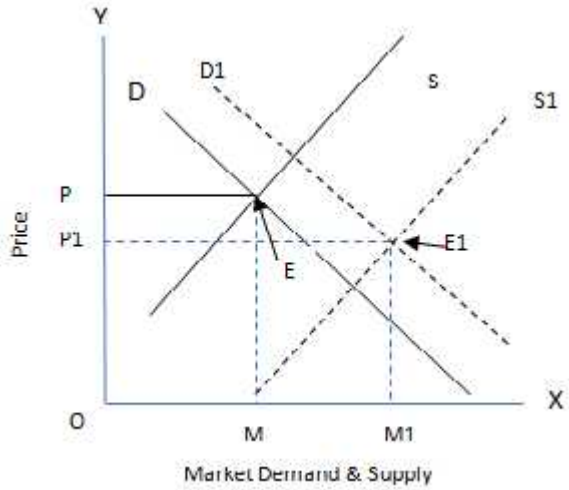
Ans:- There can be Three situations of a simultaneous right wards shift of supply curves and demand curves.

(i) **When demand increases more than supply price and quantity both will increase:**



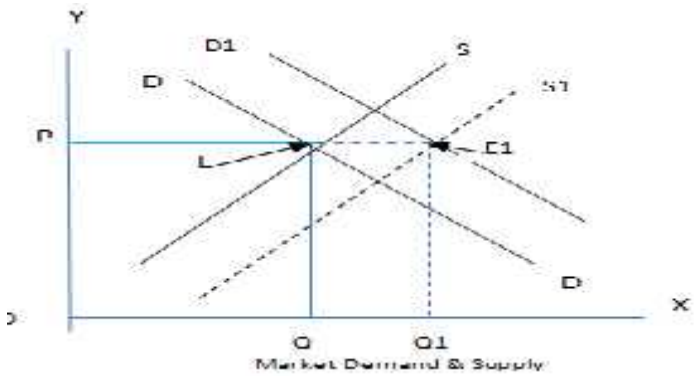
(a) When increase in demand is more than increase in supply price increases from OP to OP1.
(b) Quantity increases from OM to OM1. (c) Equilibrium point shift rightward from E to E1.

(ii) When demand increases less than supply, price will fall but quantity will rise:



(a) When supply increases more than demand price falls from OP to OP1.
(b) Q quantity demand increases from OM to OM1.
(c) Equilibrium point shift rightward from E to E1.

(iii) When demand and supply increases equally then equilibrium price remain same:

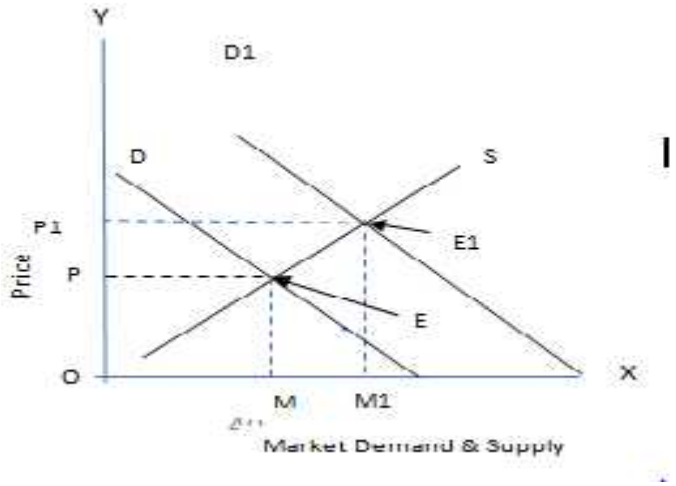


(a) When increase in demand is equal to increase in supply price remains unchanged at OP.

(b) Quantity exchanged increases from OQ to OQ_1.
(c) Equilibrium point shift rightward from E to E1.

Q6. Market for a good is in equilibrium. There is increase in demand for the goods. Explain the chain effect of this change.

Ans. <u>Increase in Demand</u>:- In case of increase in demand, demand curve shift to the right.

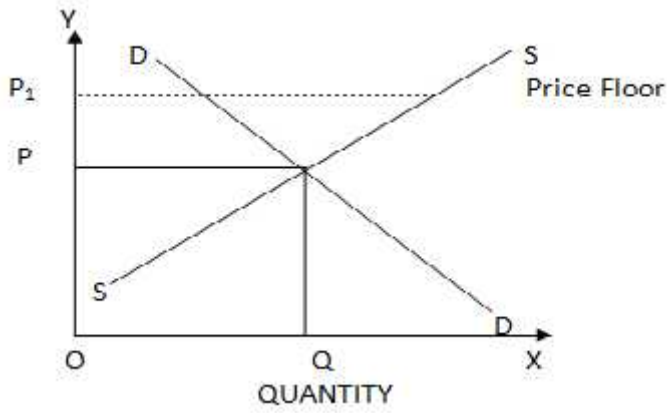


- Increase in demand shift the demand curve from D to D_1 to right leading to excess demand E E_1 at the given price OP.
- There will be competition among buyers leading to rise in price.
- As price rise supply starts rising (along S) demand starts falling.
- These changes continues till D=S at a new equilibrium at E_1
- The quantity rises to OM to OM_1 and price rises OP to OP_1

Q7.What are the effects of price floor (minimum price ceiling) on the market of a good ? Use diagram.

Ans: <u>Price floor:</u> When the government imposed lower limit on the price that they may be charged for the particular commodity is called price floor. In other words price being fined above the equilibrium price.

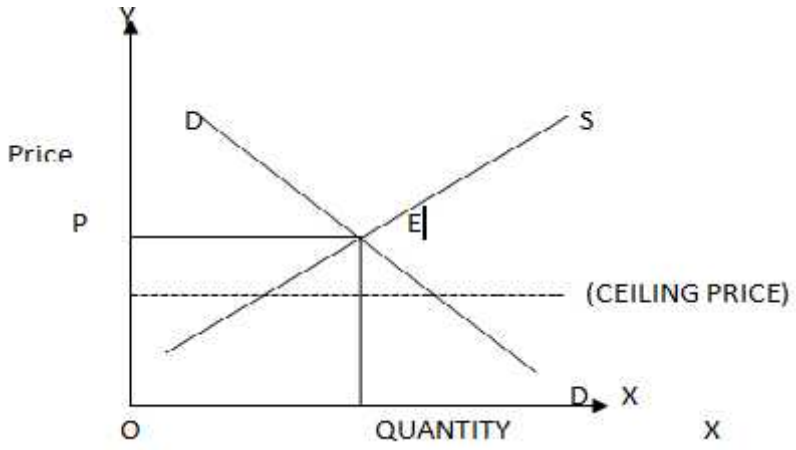
- Most well-known examples of imposition of price floor are agricultural price support programme and the minimum wage legislation.
- These programmes are meant to insulate farmers and labours from income fluctuations resulting from price variations in the free market.
- Through an agricultural price support programmes, the govt. imposes a lower limit on the purchase price for some of the agricultural goods and the floor is normally set at a higher level than the equilibrium price of these goods.



Q8. Explain the effects of maximum price ceiling on the market of a good. Use diagram.

Ans. Price ceiling: Price ceiling means maximum price of a product that the sellers can charge from the buyers. Often, the government fixes this price much below the equilibrium market price so that the essential commodities are within the reach of the poorer section of the society . In terms of demand and supply curves, price ceiling means fixing price by the government below the equilibrium price when the equilibrium price is presumed to be too high.

- Price ceiling is generally imposed by the govt. on necessary items wheat, rice, kerosene, sugar, medicines during in times of 'shortages'
- To ensure availability of the product to everyone ration coupons are issued to the buyers so that no individual can buy more than a certain amount of the commodity and this stipulated amount of the commodity is sold through ration shops or fair price shops.



Q9: Market for a good is in equilibrium. There is simultaneous decrease both in demand and supply but there is no change in price. Explain how it is possible. Use schedule.

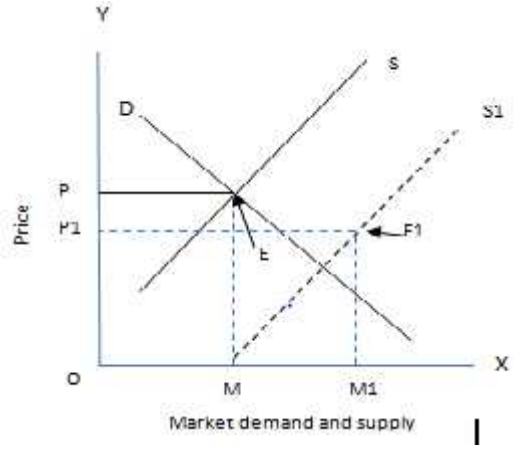
Ans.

Price (Rs.)	Quantity Demand (Units)	Quantity Supply(Units)
5	40	80
4	60	60
3	80	40
After simultaneous Decrease in Demand & Supply		
5	**20**	**40**
4	**30**	**30**
3	**40**	**20**

From the above schedule, its clear that at price Rs.4, the market demand is equal to market supply of 60 Units. Hence at Rs. 4, the market is in equilibrium. For market price to remain unchanged. Decrease in demand should be exactly equal to decrease in supply.

Q10. Market for a good is in equilibrium .Supply of the good increases. Explain the chain of effects of this change.

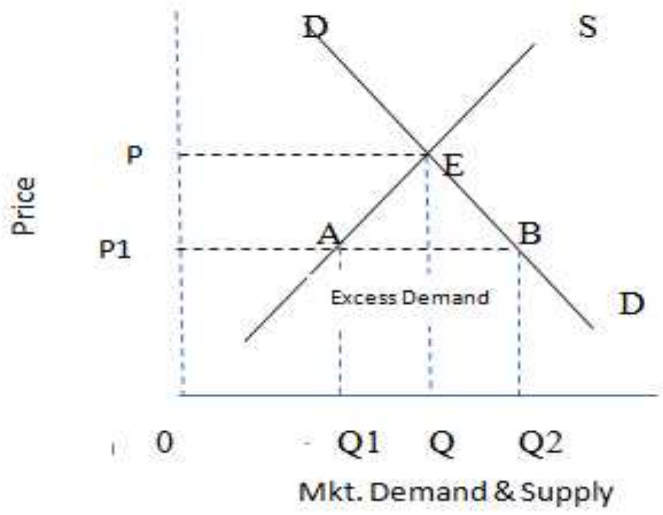
Ans.Increase in supply:- In case of increase in supply, the supply curve shifts to the right.



- Increase in supply shift the supply curve from S to S_1 to right leading to excess supply E E_1 at the given price OP.
- There will be competition among buyers leading to fill in price.
- As price fall supply starts rising (along D).
- These changes continues till D=S at a new equilibrium at E_1
- The quantity rises to OM to OM_1 and price fall OP to OP_1

Q11.If the equilibrium price of a good is greater than its market price, explain all the changes that will take place in the market. Use diagram.

Ans. Market demand and market supply are equal at point E. Thus point E shows the equilibrium price. The point signifies that equilibrium price is OP and equilibrium quantity is OQ.



In this diagram, OP is the equilibrium price which is greater than the market price OP1. At the given market price, there is a excess demand = AB. This triggers a rise market price. In response to the rise in price the quantity supplied tends to rise, leading to upward movement along the supply curve from A to E, Also rise in the price lead to backward movement along the demand curve , from point B to E , indicating the fall quantity

demand movement along supply and demand curve would continue to occur till excess demand is eliminated, and equilibrium is restored. This occurs at point E , where market demand = market supply and equilibrium price = OP.

SHORT & LONG ANSWER TYPES QUESTION (CBSE BOARD)

Q1. If the equilibrium price of a good is greater than its market price, explain all the changes that will take place in the market. Use diagram. (AI2013)

Q2. Explain the effect of increase in demand for a good on its equilibrium price and equilibrium quantity.(F 2013)

Q3. Market of commodity is in equilibrium. Demand for the commodity increases. Explain the change of effects of this change till the market again reaches equilibrium. Use diagram. **(OR)** Market for a good is in equilibrium. The Demand for the good increase . Explain the change of effects of this change. (Delhi 2014,2015; AI2015; F2015)

Q4. Market of commodity is in equilibrium. Demand for the commodity decreases. Explain the change of effects of this change till the market again reaches equilibrium. Use diagram. **(OR)** Market for a good is in equilibrium. Demand for the good decreases. Explain the change of effects of this change. (Delhi 2014,2015; AI2014; F2015)

Q5. Market for a product is in equilibrium. Supply of the product decreases. Explain the change of effects of this change till the market again reaches equilibrium. Use diagram. **(OR)** Market for a good is in equilibrium .Supply of the good decreases. Explain the change of effects of this change on the market for the good. Use diagram. (Delhi 2014; AI2015; F2014,2015)

Q6. Whet is meant by excess supply of a good in a market? Explain its chain of effects on the market for the good .Use diagram. (F 2014)

Q7. Market for a good is in equilibrium. Supply of the good increases. Explain the chain of effects of this change. (Delhi 2015; AI2015)

Q8. Explain the effects of maximum price ceiling on the market of a good. Use diagram. (Delhi 2015)

Q9. What are the effects of price floor (minimum price ceiling) on the market of a good ? Use diagram. (AI2015)

Q10. Whit is maximum price ceiling? on what type of goods is it normally imposed. Use diagram. (F 2015)

Q11. Whet is minimum price ceiling? Explain its implications. (AI 2016)

Q12. Whet is maximum price ceiling? Explain its implications. (Delhi 2016)

Q13. If the prevailing market price is above the equilibrium price, explain its chain of effects. (AI 2016)

Q14. Explain through a diagram the effect of a rightward shift of both the demand and supply curves on equilibrium price and quantity. **OR** Market for a good is in equilibrium. There is simultaneous increase both in demand and supply of the good. Explain its effect on market price.

Q15. How the equilibrium price of a commodity determined under perfect competition? Explain with the help of a schedule and diagram.

Q16. Market for a good is in equilibrium. There is simultaneous decrease both in demand and supply of the good. Explain its effect on market price.

Q17. Market for a good is in equilibrium. There is simultaneous increase both in demand and supply but there is no change in price. Explain how is it possible. Use schedule.

Q18. Market for a good is in equilibrium. There is simultaneous decrease both in demand and supply but there is no change in price. Explain how it is possible. Use schedule.

Q19. What happens if the market price is more than and less than the equilibrium price. Use a schedule and diagram.