**BLUE PRINT 2019-2020**

**MATHEMATICS- Basic Paper -II**

**CLASS:-X**

**Time Allowed: 03 Hours Maximum Marks: 80**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Topic/Unit** | **Section -A** | **Section -B** | **Section –C** | **Section -D** | **Total** |
| Number System | 1(1) | 2(1) | 3(1) | - | 06(3) |
| Algebra | 9(9) |  | 3(1) | 8(2) | 20(12) |
| Co-Geometry | 1(1) | 2(1) | 3(1) |  | 06(3) |
| Geometry | 2(2) |  | 9(3) | 4(1) | 15(6) |
| Trigonometry | 2(2) |  | 6(2) | 4(1) | 12(5) |
| Mensuration | 4(4) | 2(1) |  | 4(1) | 10(6) |
| Statistics & Probability | 1(1) | 6(3) |  | 4(1) | 11(5) |
| **Total** | **20(20)** | **12(6)** | **24(8)** | **24(6)** | **80(40)** |

**Note**: Number of questions are given within brackets and marks outside the brackets

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**CLASS X (MATHEMATICS)**

**BASIC PAPER-II**

**Time : 3 Hours Maximum Marks : 80**

**General Instructions:**

1. **All questions are compulsory.**
2. **The question paper consists of 40 questions divided into four sections A, B, C and D.**
3. **Section A contains 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.**
4. **There is no overall choice. However, an internal choices have been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.**
5. **Use of calculators is not permitted.**
6. **SECTION A**
7. **(1 mark each)**
8. **Q 1- Q 10 are multiple choice questions. Select the most appropriate answer from the given options.**
9. **Q 1.**If HCF and LCM of two numbers are 4 and 9696, then the product of the two numbers is:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (a) 9696 |  | (b) 24242 | (c) 38784 | (d) 4848 |

**Q 2.** If the sum of the zeroes of the polynomial f(x) = 2x3 – 3kx2 + 4x – 5 is 6, then value of k is

 (a) 2 (b) 4 (c) –2 (d) – 4

**Q 3.** In the given figure, ∆ ABC is circumscribing a circle , then the length of BC is

8 cm

3 cm

4 cm

A

N

M

B

C

L

1. 9 cm (b) 7cm (c) 8 cm (d)10 cm

**Q 4.** The number of zeroes of the polynomial from the adjacent graph is

 (a) 0 (b) 1 (c) 2 (d) 3

**Q 5.** The distance between points A(2, 3) and B(4, 1) is

1. 0 units (b) 2√2 units (c) 2 units (d) 8 units

**Q 6.** If $sinA = \frac{24}{25},$ then the value of$ cosecA$ is

1. 25/24 (b) 5/4 (c) 4/5 (d) 1

**Q7.** A quadratic polynomial whose sum and product of zeroes are –3 and 2 is

(a) x2 – 3x +2 (b) x2 + 3x + 2 (c) x2 + 2x – 3. (d) x2 + 2x + 3.

**Q8.**The pair of equations x + 2y + 5 = 0 and 3x + 6y + 1 = 0 have

(a) infinite number of solutions (b) unique solution

(c) no solution (d) one solution

**Q9.**In the adjacent Fig., if TP and TQ are the two tangents to a circle with centre O so that angle POQ=110°, then angle PTQ is equal to

(a)600 (b)700 (c)800 (d)900

**Q10.** The value of ‘k’ for which the quadratic equation 2kx2 + x + 3 = 0 has equal roots, is

1. 24 (b)1 / 24 (c) -24 (d)-1 / 24

**(Q11- Q20 ) Answer the following:**

**Q11.**If x+1, 3x and 4x+2 are in AP, find the value of x.

**OR**

 If the nth term of an AP is 5n-3, find the sum of first 10 terms.

**Q.12.** Express $Cot 85°+tan75°$ in terms of trigonometrical ratios having angle between $0° to 45°$

**Q13.** If a pair of equations is inconsistent, what do say about the nature of lines. (coincident/intersecting / parallel)

**Q14.** Find the area of the sector of a circle of radius14cm with central angle 450.

**Q15.** The area of three adjacent faces of a cube is x, y and z. What is its volume V in terms of x,y and z ?

**Q16.**Write the nature of roots of the quadratic equation 9x2–6x–2 = 0.

**Q17.** Given first term of A.P is 5 and common difference is 2. Find 10th term of the A.P

**Q18.** Write the formula for total surface area of cylinder of base radius ‘r’ and height ‘h’

**OR**

Write the formula for the total surface area of a Hemi-sphere of radius ‘r’.

**Q19**. Weights of 40 eggs were recorded as given below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Weights(in gms) | 85 –89 | 90 –94 | 95 –99 | 100–104 | 105- 109 |
| No. of eggs | 10 | 12 | 15 | 4 | 2 |

Write the lower limit of the modal class.

**Q20.** Find the circumference of a circle of diameter 21 cm.

**Section B**

**Questions 21 to 26 carry 2 marks each**

**Q 21** The HCF of two numbers is 23 and their LCM is1449. If one of the numbers is 161, find the other number.

**OR**

Show that 6*n*cannot end with the digit 0 or 5 for any natural number *n*.

**Q 22.** From a circular card sheet of radius14cm,two circles of radius 3.5 cm and a rectangle of length 3cm and breadth 1cm are removed (as shown in the figure).

 Find the area of the remaining sheet.



**Q23.** One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting

(a) an ace card

(b) a red card

**OR**

A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be (i) red? (ii) white?

**Q 24.** Find the mean of the given frequency distribution table:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Class Interval | 15-25 | 25-35 | 35 - 45 | 45- 55 | 55 - 65 | 65- 75 | 75 – 85 |
| Frequency | 6 | 11 | 7 | 4 | 4 | 2 | 1 |

**Q 25.** Find the ratio in which $P(9,2)$ divides the join of $A(12 , 5)$and $B(4 ,-3)$.

**Q 26.** Two different coins are tossed together. Find the probability of getting

1. Exactly two heads (ii) at least two heads

**SECTION – C**

**Questions 27 to 34 carry 3 marks each**

**Q 27.** Prove that $\sqrt{3}$ is irrational.

**Q 28.** Find all the possible values of a, for which the distance between the points

A (a,–1) and B (5,3) is 5units.

**OR**

 Find the area of triangle ABC (in sq. units) whose vertices are A(1,3) , B(-1,0) and C(4,0).

**Q 29.** If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find 15th term of the AP

**Q 30** Prove that “The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.”

**OR**

Prove that “In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

**Q 31.** A vertical pole of length 6m casts a shadow 4m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

**Q 32.** Prove that$\sqrt{\frac{1+\sin(A)}{1-\sin(A)}}=\sec(A+\tan(A))$**.**

**OR**

If A, B and C are interior angles of a triangle ABC, then show that

$$\sin(\left(\frac{B+C}{2}\right)=\cos(\frac{A}{2}.))$$

**Q 33.** A quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB+CD = AD+BC

**OR**

Prove that “The lengths of tangents drawn from an external point to a circle are equal.”

.

**Q 34** If tan3A = cot (3A – 600), where3A is an acute angle, find the value of A.

**SECTION – D**

**Questions 35 to 40 carry 4 marks each**

**Q 35.** .An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore (without taking into consideration the time they stop at intermediate stations). If the average speed of the express train is 11km/h more than that of the passenger train, find the average speed of the two trains.

**Q 36.** Draw a triangle ABC with side BC = 6 cm, AB = 5 cm and ∠ABC = 60°. Then Construct a triangle whose sides are $\frac{3}{4}$ofthe corresponding sides of the triangle ABC.

**Q 37.** A container, opened from the top and made up of a metal sheet, is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20cm, respectively. Find the cost of the milk which can completely fill the container, at the rate of Rs 20 per litre.

**Q 38.** The sum of the digits of a two digit number is 12. The number obtained by inter changing the two digits exceeds the given number by 18. Find the number.

**OR**

For what values of a and b, the following pair of linear equations has infinite number of solutions:

2x + 3y = 7

(a - b)x + (a + b)y = 3a + b - 2

**Q 39.** The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60°. If the tower is 50 m high, find the height of the building.

**OR**

A statue, 1.6m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of the pedestal is 45°. Find the height of the pedestal.

**Q 40.** The following table shows the data of the amount donated by 100 people in a blind school.

|  |  |
| --- | --- |
| Amount Donated (in Rs.) | Number of persons |
| 0 – 100 | 2 |
| 100 – 200 | 5 |
| 200 – 300 | $$x$$ |
| 300 – 400 | 12 |
| 400 – 500 | 17 |
| 500 – 600 | 20 |
| 600 – 700 | $$y$$ |
| 700 – 800 | 9 |
| 800 – 900 | 7 |
| 900 -1000 | 4 |

 If the median of the above data is 525, find the value of $x$and $y$.

**OR**

For the following distribution, draw the cumulative frequency curve less than type and hence obtain the median from the graph.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Age equal and above (inyears)** | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| **No. Of Persons** | 100 | 90 | 75 | 50 | 25 | 15 | 5 | 0 |

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