**BLUE PRINT 2019-2020**

**MATHEMATICS- Basic Paper -III**

**CLASS:-X**

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

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| --- | --- | --- | --- | --- | --- |
| **Topic/Unit** | **Section -A** | **Section -B** | **Section –C** | **Section -D** | **Total**  |
| Number System | 1(1) | 2(1) | 3(1) | - | 06(3) |
| Algebra | 6(6) | 4(2) | 6(2) | 4(1) | 20(11) |
| Co-Geometry | 1(1) | 2(1) | 3(1) | - | 06(3) |
| Geometry | 4(4) | - | 3(1) | 8(2) | 15(7) |
| Trigonometry | 3(3) | 2(1) | 3(1) | 4(1) | 12(6) |
| Mensuration | 3(3) | - | 3(1) | 4(1) | 10(5) |
| Statistics & Probability | 2(2) | 2(1) | 3(1) | 4(1) | 11(5) |
| **Total** | **20(20)** | **12(6)** | **24(8)** | **24(6)** | **80(40)** |

**Note**: Number of questions are given within brackets

CLASS X (MATHEMATICS)

BASIC PAPER-III

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. The value of k, so that quadratic equation 2 x2 + k x + 3 = 0 has two equal roots.
10. 2$\sqrt{6}$ (b) $\pm $ 2$\sqrt{6}$ (c) $\pm 2\sqrt{3}$ (d) none of these
11. If P (E) = 0.05, what is the probability of ‘not E’?
12. 0.95 (b) 0.05 (c) 1.05 (d) 1
13. In the figure, if $∠$ATO = 40$°$, find $∠$AOB.
14. 120$°$ (b) 90$°$ (c) 150$°$ (d) 100$°$



1. Decimal expansion of $\frac{23}{2^{3}5^{2}}$will be
2. Terminating (b) non- terminating (c) Non- terminating & repeating (d) non- terminating & non- repeating
3. The sum of first five natural number is

(a) 10 (b) 12 (c) 15 (d) 20

1. The probability of getting a even number when die is thrown is

(a) 1/4 (b) 3/4 (c) 1/2 (d) 3/5

1. If sinA = ½ then angle A is

(a) 300 (b) 450 (c) 600 (d) 900

1. The distance of the points ( 3, 4 ) from origin is

(a) 5 (b) 6 (c) 10 (d) 12

1. The sum areas of a minor sector and the corresponding major sector of a circle is equal to
2. Area of the circle (b) $\frac{1}{2}$ Area of the circle (c) $\frac{1}{4}$ Area of the circle (d) $\frac{3}{4}$Area of the circle
3. The pair of equations x = 0 , y =0 represents

 (a) Parallel lines (b) coincident lines (c) perpendicular lines (d) non-intersecting lines

 State whether the following statements are true or false. (Q No. 11 to 15)

1. A polynomial cannot have more than one zero.

**OR**

The roots of the quadratic equation ax2 + bx + c =0 are equal if the discriminant is not equal to zero.

1. If a line divides any two sides of a triangle in same ratio then it is parallel to the third side.
2. In $∆$ABC sin ($\frac{B+C}{2}$) = cos $\frac{A}{2}$
3. All congruent triangles are similar.
4. The sum to first ‘n’ natural numbers is [n (n+1)] / 3

 Fill in the Blanks. (Q No. 16 to 20)

1. A tangent to a circle intersects it in.................... point(s).
2. A quadratic equation cannot have more than ...........roots.
3. The total surface area of a solid hemisphere having radius R is...............
4. cosec (90 – $θ$) =............

**OR**

The value of Sin A . cos A . tan A. Cot A. Sec A. Cosec A is \_\_\_\_\_\_\_\_\_\_\_

1. Diagonals of a rectangle......................each other and are equal.

**SECTION –B**

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

1. Given that HCF (306, 657) = 9, Find LCM (306, 657).
2. Evaluate $\frac{\cos(45°)}{sec30°+cosec30°}$

**OR**

Given tan A = 4 / 3, find sin A and sec A

1. Find a quadratic polynomial whose sum and product of zeroes are $\frac{1}{4}$ and -1 respectively.
2. Which term of the AP: 3, 8, 13, 18......... is 78?

**OR**

Find the 20th term from the last term of the AP: 3, 8, 13…………….253.

1. What is the distance between the points A (5, 2) and B (2, -2)
2. Savita and Hamida are friends. What is the probability that both will have (a) different birthdays? (b) the same birthday ? (ignoring a leap year)

**SECTION – C**

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

1. Use Euclid’s division algorithm to find the HCF of 4052 and 12576.
2. Solve 6x +3y= 6xy , 2x + 4y =5xy

 **OR**

For what values of k will the following pair of linear equations have infinitely many solutions?

Kx + 3y – (K-3) =0 12x + ky –k = 0

1. Find the sum of the first 15 multiples of 8.
2. Find the ratio in which the line segment joining A (1, -5) and B (-4, 5) is divided by the x-axis.

 **OR**

Find the area of the quadrilateral whose vertices, taken in order are (-4, -2), (-3, -5), (3, -2) and (2, 3)

1. Prove that the length of tangents drawn from an external point to a circle are equal.
2. Evaluate : 2 ($\frac{\cos(58°)}{\sin(32°)}$) - $\sqrt{3} (\frac{\cos(38° cosec 52°)}{\tan(15°\tan(60°\tan(75°)))}$)

 **OR**

Prove that $\frac{\cos(A )}{1+\sin(A )}$ + $\frac{1+\sin(A)}{\cos(A )}= $ 2 sec A

1. OACB is a quadrant of a circle with centre O and radius 3.5 cm. If OD = 2 cm, find the area of the

(i) Quadrant OACB

(ii) Shaded region 

1. A bag contains 7green, 10 blue and 5 red balls. A ball is drawn at random. Find the probability of this ball being a :
	1. Blue ball.
	2. red ball or a green ball
	3. not a green ball

**SECTION – E**

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

1. The sum of reciprocals of Rehman’s age, ( in years) 3 years ago and 5 years from now is 1/3. Find his present age.

 **OR**

In a class test, the sum of Shefali’s, marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find the marks in the two subjects.

1. Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.
2. Draw a triangle ABC with side BC = 7 cm, $∠$B =45$°$, $∠$C = 30$°$ . Then construct a triangle whose sides are $\frac{4}{3}$ times the corresponding sides of $∆$ABC. (Also write steps of construction)
3. The angle of elevation of the top of a building from the foot of the tower is 300 and the angle of elevation of the top of the tower from the foot of the building is 600. If the tower is 50 m high, find the height of the building.

**OR**

From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60$°$ and the angle of depression of its foot is 45$°$. Determine the height of the tower.

1. A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter of the sphere is 14 cm and the total height of the vessel is 13 cm. Find the capacity of the vessel.
2. If the median for the following frequency distribution is 28.5, find the values of x and y.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Class interval | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | Total |
| Frequency | 5 | X | 20 | 15 | Y | 5 | 100 |

**OR**

 If the mean distribution is 25

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Class | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
| Frequency | 5 | 18 | 15 | P | 6 |

 Find the value of P

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