

**PRE-BOARD-BASIC (241) (2019-2020)**

GRADE: X CBSE

TOTAL MARKS:

80

**MATHEMATICS**

TIME: 3 Hours

**Instructions:-**

- (i) All questions are compulsory
- (ii) The paper consists of 40 questions divided into four sections A,B,C and D
- (iii) Section A consists of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C consist of questions of 3 mark each. Section D consist of 6 questions of 4 mark each.
- (iv) Internal choices are given in all sections. You have to attempt only one of the alternatives in all such questions.
- (v) Use of calculators is not permitted.

**SECTION A**

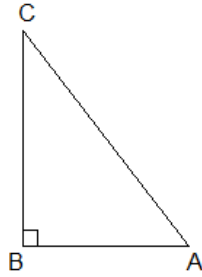
1. If the  $n^{\text{th}}$  term of an A.P is  $a_n = 5n-3$ , then the sum of first 10 terms is  
a) 225    b) 245    c) 255    d) 270
2. If  $\frac{1}{2}$  is a root of the polynomial  $x^2 + kx - \frac{5}{4} = 0$ , then value of k is  
a) 2    b) -2    c)  $\frac{1}{4}$     d)  $\frac{1}{4}$
3. If  $p_1, p_2$  are two odd prime numbers such that  $p_1 > p_2$ , then  $p_1^2 - p_2^2$  is  
a) Even number    b) odd number  
c) Odd prime number    d) prime number
4.  $\triangle ABC \sim \triangle PQR$  with  $\frac{BC}{QR} = \frac{1}{3}$ , then  $\frac{ar(\triangle ABC)}{ar(\triangle PQR)}$  is  
a) 9    b) 3    c)  $\frac{1}{3}$     d)  $\frac{1}{9}$
5. If A (4,3) and B(x,5) are on the circle with center O (2,3), then the value of x is  
a) 0    b) 1    c) 2    d) 3
6. Two coins are tossed simultaneously. The probability of getting at most one head is  
a)  $\frac{1}{4}$     b)  $\frac{1}{2}$     c)  $\frac{3}{4}$     d) 1
7. The range of the data 14,27,29,61,45,15,9 is  
a) 4    b) 52    c) 6    d) 24
8. A sector is cut from a circular sheet of radius 100cm, the angle of the sector is  $240^\circ$ . The area of the sector is  
a)  $20933.34\text{cm}^2$     b)  $2500\text{cm}^2$     c)  $3000\text{cm}^2$     d)  $25\text{cm}^2$
9. TQ and TP are two tangents to a circle with center O so that  $\angle POQ = 130^\circ$ , then  $\angle PTQ$  is  
a)  $50^\circ$     b)  $70^\circ$     c)  $80^\circ$     d) none of these
10. If  $\cos A = \frac{24}{25}$ , then value of  $\sin A$  is  
a)  $\frac{7}{25}$     b)  $\frac{24}{25}$     c) 1    d) none of these

**Fill in the blanks**

11. C is the mid-point of PQ, if P is (4, x), C (y, -1) and Q (-2,4), then x and y respectively are \_\_\_\_.
12. Triangle in which we study trigonometric ratios is called \_\_\_\_\_.

**OR**

In the figure, the length of BC is \_\_\_\_\_.



13. A letter of English alphabet is chosen at random. The probability that the chosen letter is a consonant is \_\_\_\_\_.
14. Two polygons of the same number of sides are similar, if all the corresponding angles are \_\_\_\_\_.
15.  $\frac{23}{200}$  is a rational number which have \_\_\_\_\_ repeating decimal expansion.

**Answer the following**

16. What is the HCF of 240 and 228?
17. Find a point on x-axis which is equidistant from the points A (-2,3) and B (5,4).

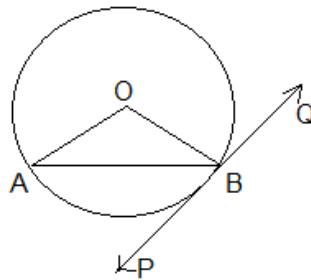
**OR**

Are the points (1,5) (2,3) (-2, -11) collinear?

18. Find the value of k for which the sum of the zeroes of the polynomial  $2x^2 - 3kx - 5$  is 6.
19. In  $\triangle ABC$  right angled at B,  $AB = 24\text{cm}$ ,  $BC = 7\text{cm}$ , what is the value of  $\sin A$ ?
20. If  $\alpha$  and  $\beta$  are zeroes of the polynomial  $x^2 - x - 4$ , then find the value of  $\frac{1}{\alpha} + \frac{1}{\beta}$

**SECTION B**

21. In figure PQ is a tangent to a circle with center O. If  $\angle OAB = 30^\circ$ , find  $\angle ABP$  and  $\angle AOB$ .



22. Find the value of  $\frac{2 \tan 30^\circ}{1 + \tan^2 30^\circ}$ .
23. A box contains 25 cards numbered from 1 to 25. A card is drawn from the box at random. Find the probability of getting the card with (a) a perfect square number (b) a perfect cube number.
24. A sector is cut from a circle of radius 21cm. The angle of the sector is  $150^\circ$ . Find the length of the arc.
25. Find the quadratic polynomial whose sum and product of zeroes are  $2 + \sqrt{3}$  and  $2 - \sqrt{3}$ .

**OR**

Find the value of k for which  $1/2$  is a root of the quadratic polynomial  $x^2 + kx - \frac{5}{4}$ .

26. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting  
 a) a heart card                      b) the seven of clubs.

## SECTION C

27. There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?
28. Find the zeroes of the quadratic polynomial  $x^2 + 5x + 6$  and verify the relationship between the zeroes and the coefficients.

OR

- A polynomial  $g(x)$  of degree zero is added to the polynomial  $2x^3 + 5x^2 - 14x + 10$  so that it becomes exactly divisible by  $2x - 3$ . Find the  $g(x)$ .
29. The larger of two supplementary angles exceeds thrice the smaller by 20 degrees. Find them.

OR

Solve the pairs of equations by reducing them to a pair of linear equations:

$$\frac{1}{2x} + \frac{1}{3y} = 2; \quad \frac{1}{3x} + \frac{1}{2y} = \frac{13}{6}$$

30. Find the values of  $y$  for which the distance between the points  $P(2, -3)$  and  $Q(10, y)$  is 10 units.
31. If  $\sin(A - B) = \frac{1}{2}$ ;  $\cos(A + B) = \frac{1}{2}$ ,  $0^\circ < A + B \leq 90^\circ$ ,  $A > B$ , find  $A$  and  $B$ .

OR

Given,  $15 \cot A = 8$ , calculate all other trigonometric ratios.

32. Prove that the length of the tangents drawn from an external point are equal
33. Construct a triangle of sides 4 cm, 5 cm and 6 cm and then a triangle similar to it whose sides are  $\frac{2}{3}$  of the corresponding sides of the first triangle.
34. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.

## SECTION D

35. Find the two consecutive positive integers whose sum of the squares is 365.
36. Find the sum of first 22 terms of an AP in which  $d = 7$  and 22nd term is 149.

OR

An AP consists of 50 terms of which 3rd term is 12 and the last term is 106. Find the 29th term.

37. The angle of elevation of the top of a building from the foot of the tower is  $30^\circ$  and the angle of elevation of the top of the tower from the foot of the building is  $60^\circ$ . If the tower is 50 m high, find the height of the building.
38. A metallic sphere of radius 4.2 cm is melted and recast into the shape of a cylinder of radius 6 cm. Find the height of the cylinder
39. State and prove Pythagoras theorem.

OR

Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

40. The following distribution gives the daily income of 50 workers of a factory:

Daily Income	400 - 420	420 - 440	440 - 460	460 - 480	480 - 500
Number of workers	12	14	8	6	10

Convert this distribution to less than type of cumulative frequency distribution and draw its ogive.