INTERNATIONAL INDIAN SCHOOL BURAIDAH

Term-1 Examination (2023-2024)
Sample Question Paper
Mathematics
Class : 10

General Instructions:

1. This question paper contains five sections – A, B , C D and E .*Each part is compulsory. However there are internal choices in some questions.*

2. Section - A has 18 MCQ questions and 02 Assertion Reason based question of 1 mark each

3. Section - B has 5 very short answer type (VSA) questions of 2 marks each

4. Section - C has 6 short answer type (SA) questions of 3 marks each

5. Section - D has 4 long answer type (LA) questions of 5 marks each

6. Section - E has 3 source based/case based/ passage based/ integrated units of assessment (4 marks each) with sub parts.

7. Use of calculator is not permitted.

Section A

(Each question carries 1 mark)

1. If two positive integers p and q can be expressed as p = a^2b and q = a b^3 ; where a , b being prime numbers, then the LCM of p and q is

   [a) ab   b) a^2b c) $a^2 b^3$ d) a b^3]

2. If $\sin \theta = \cos \theta, then\ cosec\theta$ is

   [a) $\sqrt{2}$ b) 1 c) 0 d) 2]

3. If the graph of p(x) intersects on x– axis at two points, the number of zeroes is

   [a) 0   b) 1   c) 2   d) 3   ]

4. If triangle ABC is similar to triangle DEF such that 2AB = DE and BC = 8 cm then EF is

   [a) 8cm   b) 4cm   c) 2cm   d) 16cm]

5. If the sum of the zeroes of the quadratic polynomial $kx^2 + 2x + 3k$ is equal to their product, then k is

   [a) 2   b) 2/3   c) -2/3   d) 3   ]

6. If $\sin(60 + \alpha) = 1, then\ \alpha\ is$

[a) 0   b) 30   c) 60   d) 90   ]

7. For what value of k , the system of equations, k x + 3 y = 1 , 12x + k y = 2 has no solution.

[a) 6   b) -6   c) 1   d) 2]

8. HCF (6, 20) = 2, find LCM(6, 20)

[a 120   b) 60   c) 20   d) 10]

9. In a distribution mean is 20 and median is 25 , mode is -----------

[a) 45   b) 50   c) 15   d) 40   ]

10. I f $x = \frac{-1}{2}$ is a solution of $3x^2 + 2kx - 3 = 0$, find the value of k.

[a) 0   b) -3/2   c) 3   d) 2   ]

11. In ΔABC, DE parallel to BC and AD = $x, DB = x - 2 , AE = x + 2\ and$

$EC = x - 1$, then x is

[a) 2   b) 3   c) 4   d) -2   ]

12. The value of $\frac{5}{cosec^2\theta} + \frac{5}{sec^2\theta}$.

[a) -5   b) 10   c) 5   0]

13. The HCF and LCM of 25 and 75 is

[a) 25, 75   b) 5 , 100   c) 25, 100   d) 10 , 75]

14. If $cosec\theta = \sqrt{10}, then\ cos\theta\ is$

[a) 10   b) $\frac{3}{\sqrt{10}}$ c) 0   d) $\frac{9}{10}$]

15. The discriminant of $\sqrt{3}x^2 - 2x - \sqrt{3} = 0$ is

[a) 1   b) 4   c) 16   d) 6   ]

16. If HCF (a, b) = 5,   LCM (a, b) = 30 , find a x b .

[a) 35   b) 25   c) 6   d) 150   ]

17. The value of p for which the quadratic equation , $4x^2 + px + 1 = 0$, has equal roots is

[a) 2   b) ± 4 c) 3   d) 5   ]

18. The value of the variable which divides the group onto two equal parts is --------

   [a) mean   b) median   c) mode   d) frequency   ]

ASSERTION – REASON BASED QUESTION

In the following question , a statement of assertion (A) is followed by a statement of reason © . Choose the correct answer out of the following choices.

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

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

© A is true but R is false.

(d) A is false but R is true.

19. ASSERTION: If $\Delta ABC \sim \Delta PQR$, then $\Delta ABC \cong \Delta PQR$

   REASON : Congruent figures are always similar.

20. ASSERTION: sin (A+B) = sin A+ sin B

   REASON : The value of $\sin \theta$ $increases\ as\ \theta\ increases$.

Section B

(Questions carry 2 marks each)

21. Solve by elimination method : $x - 5y - 4 = 0$ $and\ 9x = 2y + 7$ OR

   Using substitution method , solve $x + 3y = 6$ $and\ 2x - 3y = 12$ and hence   find the value of a, if $4x + 3y = a$.

22. Find the nature of roots of the equation , $13\sqrt{3}x^2 + 10x + \sqrt{3} = 0$

23. Expressed 225 in prime factorization   OR

   Find the LCM of 45, 60 and 120 using prime factorisation method.

24. S and T are points on sides PR and QR of Δ PQR such that ∠ P = ∠ RTS. Show that

Δ RPQ ~ Δ RTS.

25 Evaluate : $\frac{cos45^0}{sec30^0} + \frac{1}{sec60^0}$

Section C

(Questions carry 3 marks each)

26. If α and β are zeroes of the quadratic polynomial $f(x) = x^2 - x + 4$, then what is the value of $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$?   OR

Find the zeroes of the quadratic polynomial , $3x^2 - x - 4 = 0$ and verify the relationship between zeroes and coefficients

27. Prove that $7 - 3\sqrt{2}$ is irrational.

28. The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number.   OR

The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3 . If each of them manages to save RS 2000 per month, find their monthly incomes.

29. The sum of ages of a son and his father is 35years and the product of the ages is 150years , find their ages.

30. Prove that : $\frac{sinA - cosA}{sinA + cosA} + \frac{sinA + cosA}{sinA - cosA} = \frac{2}{2sin^2A - 1}$

31. Calculate the missing frequency , if the mean of the distribution is 29.

C . I	0 -10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Frequency	5	f	12	18	5	3

(Questions carry 5 marks each)

32. Draw the graphs of the pair of linear equations : x+2 y = 5 and 2x- 3y = − 4

Also find the points where the lines meet the x –axis.

OR

Solve graphically : $3x - 4y + 3 = 0$; $3x + 4y - 21 = 0$

33. Prove that √2 is an irrational number.

34. Calculate the missing frequencies, if the median is 28 and total frequency is 44.

| Class	0 – 10	10 – 20	20 – 30	30 – 40	40 - 50	50 – 60
Frequency	3	x	15	9	y	4

35. State and prove Basic proportionality theorem.

OR

Sides AB, BC and median AD of a triangle ABC are respectively proportional to sides PQ, QR and median PM of triangle PQR . Show that $\Delta ABC \sim \Delta PQR$.

Case study based

36. Due to heavy storm an electric wire got bent as shown in figure. It followed a mathematical shape. Answer the following questions below.
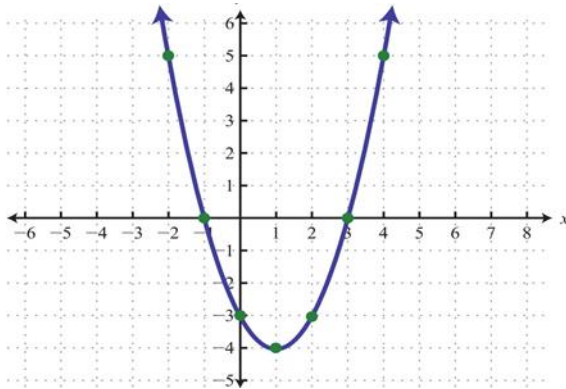
i) How many zeroes are there for the polynomial   (1)

 ii)   Find the   zeroes of the polynomial   (1)

ii) What will be the expression for the polynomial

   OR   What is the value of the polynomial if x = (-1)   (2)

37. Mr. RK Agrawal is owner of a famous amusement park in Delhi. The ticket charge for the park is Rs 15 for children and Rs 40 for adult. Generally he does not go to park and it is managed by team of staff. One day Mr Agrawal decided to random check the park and went there. When he checked the cash counter, he found that 48 tickets were sold and Rs 1345 was collected.

(i) Let the number of children visited be x and the number of adults visited be y Form the system of equations that model the problem ?   (1)

(ii) How many children visited the park ?

    OR   How many adults visited the park?   (1)

(Iii) How much amount collected if 30 children and 35 adults visited the park? (2)

38. Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 km.

1. What will be the distance covered by Ajay's car in two hours? (1)

2. Write the quadratic equation describe the speed of Raj's car? (1)

3. What is the speed of Raj's car?

  OR How much time took Ajay to travel 400 km?   (2)

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