Sample Paper 6

Time : 90 Minutes **Max Marks : 40**

General Instructions

1. *The question paper contains three parts A, B and C.*
2. *Section A consists of 20 quesions of 1 mark each. Any 16 quesitons are to be attempted.*
3. *Section B consists of 20 quersions of 1 mark each. Any 16 quesions are to be attempted.*
4. *Section C consists of 10 quesions based two Case Studies. Attempt any 8 questions.*
5. *There is no negative marking.*

SECTION-A

Section A consists of 20 questions of 1 mark each. Any 16 quesions are to be attempted.

1. Let $P(x)$ be a polynomial of degree 3 and $P(n) = \frac{1}{2}$ for $n = 1, 2, 3, 4$. Then the value of $P(5)$ is

(a) 0 (b) $\frac{1}{5}$ (c) $-\frac{2}{5}$ (d) $\frac{3}{5}$

2. If the area of a square inscribed in a semicircle is 2cm^2, then the area of the square inscribed in a full circle of the same radius is _____

(a) $5\ \text{cm}^2$ (b) $10\ \text{cm}^2$ (c) $5\sqrt{2}\ \text{cm}^2$ (d) $25\ \text{cm}^2$

3. Which of the following points is 10 units from the origin?

(a) (– 6, 8) (b) (– 4, 2) (c) (– 6, 5) (d) (6, 4)

4. The sum of the digits of a two-digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is

(a) 25 (b) 72 (c) 63 (d) 36

5. Find the largest number of four digits exactly divisible by 12, 15, 18 and 27.

(a) 9720 (b) 9728 (c) 9270 (d) 7290

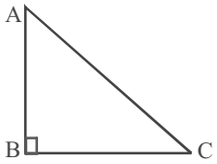
6. A circle passes through the vertices of a triangle ABC. If the vertices are A(–2, 5), B(–2, –3), C(2, –3), then the centre of the circle is

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

7. The value of $(\sin 45° + \cos 45°)$ is

(a) $\frac{1}{\sqrt{2}}$ (b) $\sqrt{2}$ (c) $\frac{\sqrt{3}}{2}$ (d) 1

8. In a right angled triangle ΔABC, length of two sides are 8 cm and 6 cm, then which among the given statements is/are correct?



(a) Length of greatest side is 10cm
(b) $\angle ACB = 45°$
(c) $\angle BAC = 45°$
(d) Pythagoras theorem is not applicable here.

9. Product of two co-prime numbers is 117. Their L.C.M. should be

(a) 1 (b) 117 (c) equal to their H.C.F. (d) Lies between 1 to 117

10. The centre of the circle passing through the ponts (6, – 6), (3, – 7) and (3, 3) is

(a) (3, 2) (b) (–3, –2) (c) (3, – 2) (d) (–3, 2)

11. Let a and b be co-prime, thus a^2 and b^2 are:

(a) co-prime (b) not co-prime (c) odd numbers (d) even numbers

12. Which among the following is/are correct?

(I) If the altitudes of two similar triangles are in the ratio 2 : 1, then the ratio of their areas is 4 : 1.

(II) $PQ \parallel BC$ and $AP : PB = 1 : 2$.

Then, $\frac{\text{area}(\Delta APQ)}{\text{area}(\Delta ABC)} = \frac{1}{4}$

(III) The areas of two similar triangles are respectively $9cm^2$ and $16cm^2$. The ratio of their corresponding sides is 3 : 16.

(a) I (b) II (c) III (d) None of these

13. If Anish is moving along the boundary of a triangular field of sides 35 m, 53 m and 66 m and you are moving along the boundary of a circular field whose area is double the area of the triangular field, then the radius of the circular field is (Take $\pi = \frac{22}{7}$)

(a) $14\sqrt{3}$ m (b) $3\sqrt{14}$ m (c) $28\sqrt{3}$ m (d) $7\sqrt{3}$ m

14. The pair of equations $5x - 15y = 8$ and $3x - 9y = \frac{24}{5}$ has

(a) one solutio
(b) two solutions
(c) infinitely many solutions
(d) no solution

15. The value of $\frac{\tan 30°}{\cot 60°}$ is

(a) $\frac{1}{\sqrt{2}}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\sqrt{3}$ (d) 1

16. The decimal expansion of the rational number $\frac{33}{2^2.5}$ will terminate after

(a) one decimal place
(b) two decimal places
(c) three decimal places
(d) more than 3 decimal places

17. Which among the following is/are correct?

(a) The ratios of the areas of two similar triangles is equal to the ratio of their corresponding sides.

(b) The areas of two similar triangles are in the ratio of the corresponding altitudes.

(c) The ratio of area of two similar triangles are in the ratio of the corresponding medians.

(d) If the areas of two similar triangles are equal, then the triangles are congruent.

18. A bag contains card numbers 3, 4, 5, 6, 7....27. One card is drawn, then probability of prime number card is

(a) $\frac{9}{25}$ (b) $\frac{8}{27}$ (c) $\frac{8}{25}$ (d) $\frac{1}{5}$

19. A line l passing through the origin makes an angle θ with positive direction of x-axis such that $\sin\theta = \frac{3}{5}$. The coordinates of the point, which lies in the fourth quadrant at a unit distance from the origin and on perpendicular to l, are

(a) $\left(\frac{3}{5}, -\frac{4}{5}\right)$ (b) $\left(\frac{4}{5}, -\frac{3}{5}\right)$ (c) $(3, -4)$ (d) $(4, -3)$

20. The area of a circular path of uniform width 'd' surrounding a circular region of radius 'r' is

(a) $\pi d(2r + d)$ (b) $\pi(2r + d)\, r$ (c) $\pi(d + r)d$ (d) $\pi(d + r)r$

SECTION-B

Section B consists of 20 questions of 1 mark each. Any 16 quesions are to be attempted.

21. If ΔABC is an equilateral triangle such that $AD \perp BC$, then $AD^2 =$

A. $\frac{3a^2}{4}$ B. $\frac{3a^2}{2}$ C. $\frac{3}{4}BC^2$ D. $\frac{\sqrt{3}}{2}a$

(a) A and C (b) A (c) D (d) B and C

22. A boat takes 3 hours to travel 30 km downstream and takes 5 hours to return to the same spot upstream. Find the speed of the boat in still water. (km/hr)

(a) 10 km/hr (b) 8 km/hr (c) 6 km/hr (d) 5 km/hr

23. From the data (1, 4, 7, 16, 27, 29) if 29 is removed, the probability of getting a prime number is

(a) $\frac{1}{2}$ (b) $\frac{1}{5}$ (c) $\frac{2}{5}$ (d) $\frac{1}{3}$

24. P is a point on the graph of $y = 5x + 3$. The coordinates of a point Q are $(3, -2)$. If M is the mid point of PQ, then M must lie on the line represented by

(a) $y = 5x + 1$ (b) $y = 5x - 7$

(c) $y = \frac{5}{2}x - \frac{7}{2}$ (d) $y = \frac{5}{2}x + \frac{1}{2}$

25. If the perimeter of a semi-circular protractor is 36 cm, then its diameter is

(a) 10 cm (b) 14 cm (c) 12 cm (d) 16 cm

26. The polynomial, $f(x) = (x - 1)^2 + (x - 2)^2 + (x - 3)^2 + (x - 4)^2$ has minimum value, when $x =$ .....

(a) 40 (b) 20 (c) 10 (d) 2.5

27. In village Madhubani 8 women and 12 girls can paint a large mural in 10 hours. 6 women and 8 girls can paint it in 14 hours. The number of hours taken by 7 women and 14 girls to paint the mural is

(a) 10 (b) 15 (c) 20 (d) 35

28. In a triangle ABC, $\angle BAC = 90°$; AD is the altitude from A on to BC. Draw DE perpendicular to AC and DF perpendicular to AB. Suppose $AB = 15$ and $BC = 25$. Then the length of EF is

(a) 12 (b) 10 (c) $5\sqrt{3}$ (d) $5\sqrt{5}$

29. If the points (a, 0), (0, b) and (1, 1) are collinear then which of the following is true :

(a) $\frac{1}{a}+\frac{1}{b}=2$ (b) $\frac{1}{a}-\frac{1}{b}=1$ (c) $\frac{1}{a}-\frac{1}{b}=2$ (d) $\frac{1}{a}+\frac{1}{b}=1$

30. The value of $(\sin 30° + \cos 30°) - (\sin 60° + \cos 60°)$ is

(a) –1 (b) 0 (c) 1 (d) 2

31. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is

(a) 10 (b) –10 (c) 5 (d) –5

32. A box contains four cards numbered as 1, 2, 3 and 4 and another box contains four cards numbered as 1, 4, 9 and 16. One card is drawn at random from each box. What is the probability of getting the product of the two numbers so obtained , more than 16?

(a) $\frac{5}{8}$ (b) $\frac{1}{2}$ (c) $\frac{3}{8}$ (d) $\frac{1}{4}$

33. The distances of a point from the x-axis and the y-axis are 5 and 4 respectively. The coordinates of the point can be

(a) (5, 4) (b) (5, 0) (c) (0, 4) (d) (4, 5)

34. $\frac{1+\tan^2 A}{1+\cot^2 A} = L$

(a) $\sec^2 A$ (b) –1 (c) $\cot^2 A$ (d) $\tan^2 A$

35. Consider the following two statements:

I. Any pair of consistent linear equations in two variables must have a unique solution.

II. There do not exist two consecutive integers, the sum of whose squares is 365.

Then,

(a) both I and II are true (b) both I and II are false

(c) I is true and II is false (d) I is false and II is true

36. If the radius of a circle is diminished by 10%, then its area is diminished by

(a) 10% (b) 19% (c) 36% (d) 20%

37. Let D be a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. If $AC = 21$ cm, then the side of an equilateral triangle whose area is equal to the area of the rectangle with sides BC and DC is

(a) $14 \times 3^{1/2}$ (b) $42 \times 3^{-1/2}$ (c) $14 \times 3^{3/4}$ (d) $42 \times 3^{1/2}$

38. If one of the zeroes of the quadratic polynomial $(k-1)x^2 + kx + 1$ is –3, then the value of k is

(a) $\frac{4}{3}$ (b) $\frac{-4}{3}$ (c) $\frac{2}{3}$ (d) $\frac{-2}{3}$

39. $(\sec A + \tan A)(1 - \sin A) =$

(a) sec A (b) sin A (c) cosec A (d) cos A

40. The equations $\frac{1}{x}+\frac{1}{y}=15$ and $\frac{1}{x}-\frac{1}{y}=5$ are such that $ax = 1$ and $by = 1$. The values of 'a' and 'b' respectively are

(a) 10, 5 (b) 10, –5 (c) –5, 10 (d) 5, 10

SECTION-C

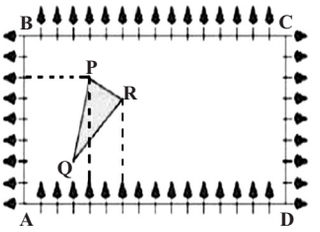
Case Study Based Questions:

Section C consists of 10 quesions of 1 mark each. Any 8 quesions are to be attempted.

Q 41. - Q 45 are based on case study-I

Case Study-I

Class X students of a secondary school in Krishnagar have been allotted a rectangular plot of a land for gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a triangular grassy lawn in the plot as shown in the fig. The students are to sow seeds of flowering plants on the remaining area of the plot.



Considering A as origin, answer question (i) to (v)

41. Considering A as the origin, what are the coordinates of A?

(a) (0, 1) (b) (1, 0) (c) (0, 0) (d) (–1, –1)

42. What are the coordinates of P?

(a) (4, 6) (b) (6, 4) (c) (4, 5) (d) (5, 4)

43. What are the coordinates of R?

(a) (6, 5) (b) (5, 6) (c) (6, 0) (d) (7, 4)

44. What are the coordinates of D?

(a) (16, 0) (b) (0, 0) (c) (0, 16) (d) (16, 0)

45. What are the coordinate of P if D is taken as the origin?

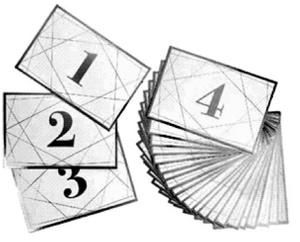
(a) (12, 2) (b) (–12, 2) (c) (12, 3) (d) (6, 10)

Q 46 - Q 50 are based on case study-II

Case Study-II

Rakesh and Mohit playing a card game. Rakesh picked up a card from properly mixed cards numbered from 1 to 25.

Then answer the following questions :



46. The probability of getting prime numbers is :

(a) $\frac{9}{25}$ (b) $\frac{10}{25}$ (c) $\frac{7}{25}$ (d) $\frac{8}{25}$

47. The probability of getting multiple of 3 is :

(a) $\frac{7}{25}$ (b) $\frac{8}{25}$ (c) $\frac{6}{25}$ (d) $\frac{9}{25}$

48. The probability of getting multiple of 2 is :

(a) $\frac{10}{25}$ (b) $\frac{13}{25}$ (c) $\frac{12}{25}$ (d) $\frac{11}{25}$

49. The probability of getting multiple of 2 and 3 is :

(a) $\frac{3}{25}$ (b) $\frac{4}{25}$ (c) $\frac{2}{25}$ (d) $\frac{16}{25}$

50. The probability of getting multiple of 2 or 3 is :

(a) $\frac{16}{25}$ (b) $\frac{4}{25}$ (c) $\frac{3}{25}$ (d) $\frac{10}{25}$