Time Allowed: 90 minutes Maximum Marks: 40

General Instructions:

1. The question paper contains three parts A, B and C.
2. Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
3. Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
4. Section C consists of 10 questions based on 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 questions are to be attempted.

1. The total number of factors of prime number is

(a) 1   (b) 0

(c) 2   (d) 3

2. The value of k for which the system of equations $x + y - 4 = 0$ and $2x + ky = 3$, has no solution, is

(a) -2 (b) $\neq 2$

(c) 3   (d) 2

3. In the given figure, x is

(a) $\dfrac{ab}{a+b}$ (b) $\dfrac{ac}{b+c}$

(c) $\dfrac{bc}{b+c}$ (d) $\dfrac{ac}{a+c}$

4. In the figure of ΔABC, the points D and E are on the sides CA, CB respectively such that $DE \parallel AB$, $AD = 2x, DC = x+3, BE = 2x-1$ and $CE = x$. Then, value of x will be

5. Two coins are tossed simultaneously. The probability of getting at most one head is

(a) $\frac{1}{4}$ (b) $\frac{1}{2}$

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

6. If ratio of corresponding sides of two similar triangles is $5:6$, then what is the ratio of their areas?

(a) $6:5$ (b) $5:6$

(c) $25:36$ (d) $36:25$

7. If ΔABC is right angled at C, then the value of $\sec(A+B)$ is

(a) 0   (b) 1

(c) $\frac{2}{\sqrt{3}}$ (d) not defined

8. The decimal expansion of $\frac{23}{2^5 \times 5^2}$ will terminate after how many places of decimal?

(a) 2   (b) 4

(c) 5   (d) 1

9. One equation of a pair of dependent linear equations $-5x + 7y = 2$ The second equation can be

(a) $10x + 14y + 4 = 0$ (b) $-10x - 14y + 4 = 0$

(c) $-10x + 14y + 4 = 0$ (d) $10x - 14y = -4$

10. If the point $P(k, 0)$ divides the line segment joining the points $A(2, -2)$ and $B(-7, 4)$ in the ratio $1:2$, then the value of k is

(a) 1   (b) 2

(c) -2 (d) -1

Top-right options (for Q1):

(a) $\frac{4}{5}$ (b) $\frac{1}{5}$

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

11. The graph of a polynomial is shown in Figure, then the number of its zeroes is
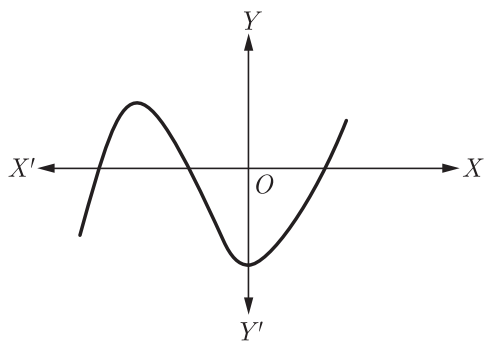
(a) 3   (b) 1

(c) 2   (d) 4

12. 1. The L.C.M. of x and 18 is 36.
2. The H.C.F. of x and 18 is 2.
What is the number x?

(a) 1   (b) 2

(c) 3   (d) 4

13. If $\cot\theta = \dfrac{12}{5}$, then the value of $\sin\theta$ is ....

(a) $\frac{5}{13}$ (b) $\frac{8}{12}$

(c) $\frac{12}{5}$ (d) $\frac{13}{5}$

14. If $\tan(A+B) = \sqrt{3}$ and $\tan(A-B) = \dfrac{1}{\sqrt{3}}$, $A > B$, then the value of A is ....

(a) 45°   (b) 60°

(c) 90°   (d) 30°

15. A sector is cut from a circular sheet of radius 100 cm, the angle of the sector being 240°. If another circle of the area same as the sector is formed, then radius of the new circle is

(a) 79.5 cm   (b) 81.5 cm

(c) 83.4 cm   (d) 88.5 cm

16. ΔABC is an equilateral triangle of side $2a$, then length of one of its altitude is ....

(a) $a\sqrt{3}$

(b) $a2\sqrt{3}$

(c) $a3\sqrt{2}$

(d) $a\sqrt{2}$

17. In $\Delta ABC, DE \parallel BC.$ If $AD = x+2, DB = 3x+16,$ $AE = x$ and $EC = 3x+5$, then x is equal to

(a) 2   (b) 3

(c) 4   (d) 5

18. If $b\tan\theta = a$, the value of $\dfrac{a\sin\theta - b\cos\theta}{a\sin\theta + b\cos\theta}$ is

(a) $\dfrac{a-b}{a^2+b^2}$ (b) $\dfrac{a+b}{a^2+b^2}$

(c) $\dfrac{a^2+b^2}{a^2-b^2}$ (d) $\dfrac{a^2-b^2}{a^2+b^2}$

19. What do you say about the lines represented by ?
$2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$

(a) lines are parallel

(b) lines are coincident

(c) lines are intersecting

(d) can't say anything

20. Someone is asked to take a number from 1 to 100. The probability that it is a prime, is

(a) $\frac{8}{25}$ (b) $\frac{1}{4}$

(c) $\frac{3}{4}$ (d) $\frac{13}{50}$

SECTION B

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

21. If two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3 b$; where a, b being prime numbers, then LCM (p,q) is equal to

(a) ab (b) $a^2 b^2$

(c) $a^3 b^2$ (d) $a^3 b^3$

22. If the point P (6, 2) divides the line segment joining $A(6,5)$ and $B(4,y)$ in the ratio $3:1$ then the value of y is

(a) 4   (b) 3

(c) 2   (d) 1

23. If $\sin\theta + \sin^2\theta = 1$ then $\cos^2\theta + \cos^4\theta = ?$

(a) 1   (b) 2

(c) $2\sqrt{2}$ (d) $2\sqrt{3}$

24. In a number of two digits, unit's digit is twice the tens digit. If 36 be added to the number, the digits are reversed. The number is

(a) 36   (b) 63

(c) 48   (d) 84

25. If one root of the equation $(k-1)x^2 - 10x + 3 = 0$ is the reciprocal of the other then the value of k is ....

(a) 2   (b) 3

(c) 4   (d) 5

26. A number x is selected from the numbers 1, 2, 3 and then a second number y is randomly selected from the numbers 1, 4, 9 then the probability that the product xy of the two numbers will be less than 9 is

(a) $\frac{3}{7}$ (b) $\frac{4}{9}$

(c) $\frac{5}{9}$ (d) $\frac{7}{9}$

27. In Figure a disc on which a player spins an arrow twice. The fraction $\frac{a}{b}$ is formed, where a is the number of sector on which arrow stops on the first spin and 'b' is the number of the sector in which the arrow stops on second spin, On each spin, each sector has equal chance of selection by the arrow. What is the probability that the fraction $\frac{a}{b} > 1$
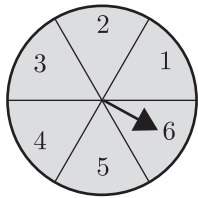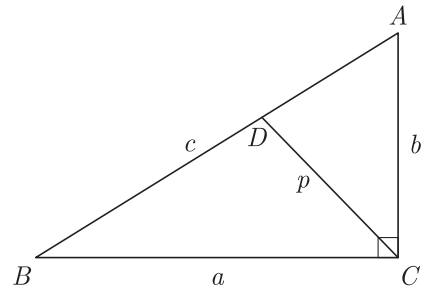

(a) $\frac{5}{12}$ (b) $\frac{7}{12}$

(c) $\frac{7}{18}$ (d) $\frac{5}{18}$

28. $\dfrac{(\sin^4\theta + \cos^4\theta)}{1 - 2\sin^2\theta\cos^2\theta} = ?$

(a) 1   (b) $\sin\theta$

(c) $\tan\theta$ (d) $\cos\theta$

29. The perimeter of a triangle with vertices $(0, 4)$, $(0, 0)$ and $(3, 0)$ is
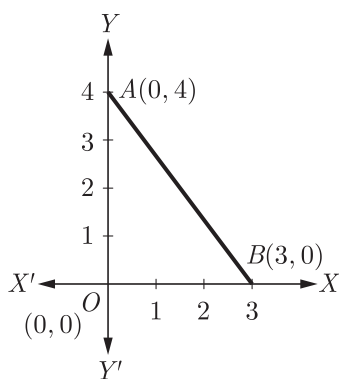
(a) 5

(b) 12

(c) 11

(d) $7 + \sqrt{5}$

30. Triangle ABC is right angled at C. Let $BC = a$, $CA = b$, $AB = c$ $PQR, ST \,|| \, QR$ and p be the length of perpendicular from C to AB. The cp is equal to


(a) ab (b) $\sqrt{ab}$

(c) $\frac{a+b}{2}$ (d) $2ab$

31. If $R(x, y)$ is a point on the line segment joining the points $P(a, b)$ and $Q(b, a)$, then which of the following is correct ?

(a) $x + y = \sqrt{ab}$ (b) $x + y = a + b$

(c) $x + a = y + b$ (d) $x + b = y + a$

32. If $\dfrac{\cos\alpha}{\cos\beta} = m$ and $\dfrac{\cos\alpha}{\sin\beta} = n$, then $(m^2 + n^2)\cos^2\beta = ?$

(a) n^2 (b) $2n^2$

(c) m^2 (d) $2m^2$

33. Three bells toll at intervals of 9, 12, 15 minutes respectively. If they start tolling together, after what time will they next toll together?

(a) 360 minute   (b) 18 minute

(c) 36 minute   (d) 180 minute

34. Triangle ΔPQR is right angled at Q. $QX \perp PR$, $XY \perp RQ$ and $XZ \perp PQ$ are drawn. The term XZ^2 is equal to
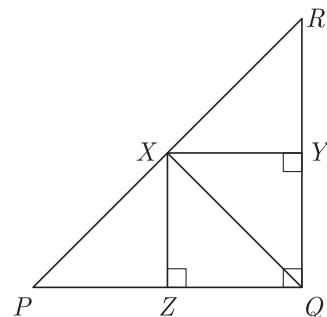
(a) $\frac{1}{2}PZ \times ZQ$ (b) $\frac{2}{3}PZ \times ZQ$

(c) $\frac{1}{4}PZ \times ZQ$ (d) $PZ \times ZQ$

35. What are the co-ordinates of the points of trisection of the line segment joining the points $(3, -2)$ and $(-3, -4)$.

(a) $\left(1, -\frac{8}{3}\right)$ and $\left(-1, -\frac{10}{3}\right)$

(b) $\left(-\frac{8}{3}, 1,\right)$ and $\left(-1, -\frac{10}{3}\right)$

(c) $\left(-\frac{8}{3}, 1,\right)$ and $\left(-\frac{10}{3}, -1\right)$

(d) $\left(1, -\frac{8}{3}\right)$ and $\left(-\frac{10}{3}, -1\right)$

36. A paper is in the form of a rectangle $ABCD$ in which $AB = 20$ cm, $BC = 14$ cm. A semi-circular portion with BC as diameter is cut off. What is the area of the part? Use $\pi = \frac{22}{7}$.

(a) 293 cm^2 (b) 203 cm^2

(c) 406 cm^2 (d) 486 cm^2

37. A momento is made as shown in the figure. Its base $PBCR$ is silver plate from the front side. What is the area which is silver plated. Use $\pi = \frac{22}{7}$.
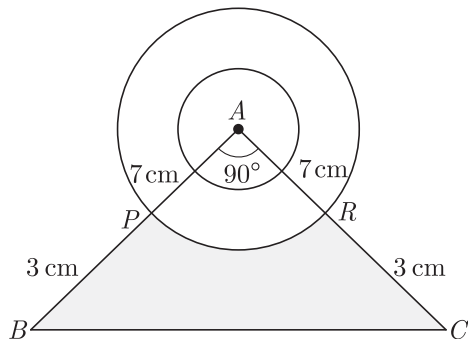
(a) 18 cm^2 (b) 23 cm^2

(c) 11.5 cm^2 (d) 29 cm^2

38. If the square of difference of the zeroes of the quadratic polynomial $x^2 + px + 45$ is equal to 144, then the value of p is

(a) ± 9 (b) ± 12

(c) ± 15 (d) ± 18

39. In the given figure $ABCD$ is a trapezium with $AB \parallel DC, AB = 18$ cm and $DC = 32$ cm and the distance between AB and AC is 14 cm. If arcs of equal radii 7 cm taking A, B, C and D have been drawn, then what is the area of the shaded region?
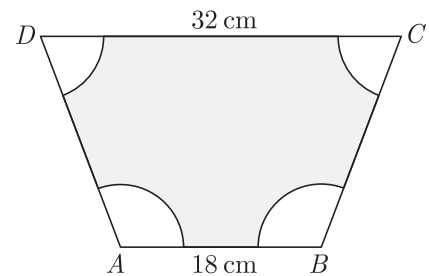
(a) 92 cm^2 (b) 252 cm^2

(c) 196 cm^2 (d) 310 cm^2

40. A fraction becomes $\frac{1}{3}$ when 2 is subtracted from the numerator and it becomes $\frac{1}{2}$ when 1 is subtracted from the denominator. The fraction will be

(a) $\frac{7}{15}$ (b) $\frac{8}{15}$

(c) $\frac{6}{15}$ (d) $\frac{9}{15}$

SECTION C

Case study based questions:

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

Case Based Questions: (41-45)

An barrels manufacturer can produce up to 300 barrels per day. The profit made from the sale of these barrels can be modelled by the function $P(x) = -10x^2 + 3500x - 66000$ where $P(x)$ is the profit in rupees and x is the number of barrels made and sold.
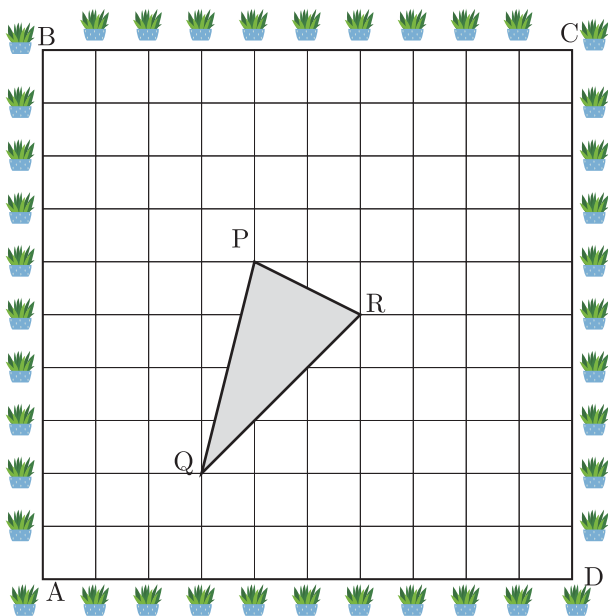

Based on this model answer the following questions:

41. When no barrels are produce what is a profit loss?

(a) ₹ 22000   (b) ₹ 66000

(c) ₹ 11000   (d) ₹ 33000

42. What is the break even point ? (Zero profit point is called break even)

(a) 10 barrels   (b) 30 barrels

(c) 20 barrels   (d) 100 barrels

43. What is the profit/loss if 175 barrels are produced

(a) Profit 266200   (b) Loss 266200

(c) Profit 240250   (d) Loss 240250

44. What is the profit/loss if 400 barrels are produced

(a) Profit ₹ 466200   (b) Loss ₹ 266000

(c) Profit ₹ 342000   (d) Loss ₹ 342000

45. What is the maximum profit which can manufacturer earn?

(a) ₹ 240250   (b) ₹ 480500

(c) ₹ 680250   (d) ₹ 240250

Case Based Questions: (46-50)

A garden is in the shape of rectangle. Gardener grew sapling of Ashoka tree on the boundary of garden at the distance of 1 meter from each other. He want to decorate the garden with rose plants. He choose triangular region inside the park to grow rose plants. On the above situation, gardener took help from the students of class 10th. They made a chart for it which looks as the above figure.

46. If A is taken as origin, what are the coordinates of triangle PQR ?

(a) $P(4,6), Q(3,2), R(6,5)$

(b) $P(6,4), Q(2,3), R(5,6)$

(c) $P(5,7), Q(3,3), R(5,5)$

(d) $P(6,6), Q(2,3), R(6,6)$

47. If C is taken as origin, what is the co-ordinate of point P ?

(a) $(-12, 2)$ (b) $(12, 2)$

(c) $(6, -4)$ (d) $(-6, -4)$

48. If B is taken as origin, what are the co-ordinate of P ?

(a) $(4, 4)$ (b) $(-4, 4)$

(c) $(4, -4)$ (d) $(-4, -4)$

49. What is distance between P and Q if origin is taken A?

(a) $\sqrt{71}$ (b) $\sqrt{17}$

(c) $\sqrt{65}$ (d) $\sqrt{50}$

50. What is distance between P and Q if origin is taken B?

(a) $\sqrt{50}$ (b) $\sqrt{71}$

(c) $\sqrt{17}$ (d) $\sqrt{61}$

SAMPLE PAPER - 2 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(c)	Ch-1	2
2	(d)	Ch-3	2
3	(b)	Ch-4	2
4	(c)	Ch-4	38
5	(d)	Ch-8	2
6	(c)	Ch-4	10
7	(d)	Ch-6	2
8	(c)	Ch-1	9
9	(d)	Ch-3	18
10	(d)	Ch-5	5
11	(a)	Ch-2	2
12	(d)	Ch-1	S-6
13	(a)	Ch-6	26
14	(a)	Ch-6	27
15	(b)	Ch-7	3
16	(a)	Ch-4	19
17	(a)	Ch-4	60
18	(d)	Ch-6	15
19	(b)	Ch-3	33
20	(c)	Ch-8	15
21	(c)	Ch-1	15
22	(d)	Ch-5	2
23	(a)	Ch-6	34
24	(c)	Ch-3	5
25	(c)	Ch-2	28

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(c)	Ch-8	29
27	(a)	Ch-8	174
28	(a)	Ch-6	58
29	(b)	Ch-5	29
30	(a)	Ch-4	50
31	(b)	Ch-5	107
32	(a)	Ch-6	127
33	(d)	Ch-1	S-28
34	(d)	Ch-4	77
35	(a)	Ch-5	82
36	(b)	Ch-7	47
37	(c)	Ch-7	60
38	(d)	Ch-2	13
39	(c)	Ch-7	70
40	(a)	Ch-3	44
41	(b)	Ch-2	89
42	(c)	Ch-2	90
43	(d)	Ch-2	91
44	(b)	Ch-2	92
45	(a)	Ch-2	93
46	(a)	Ch-5	132
47	(d)	Ch-5	133
48	(d)	Ch-5	134
49	(b)	Ch-5	135
50	(c)	Ch-5	136

* S- = Self Test Question