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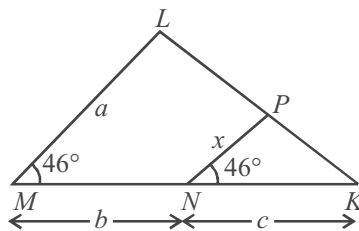
Max Marks : 40

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 two Case Studies. Attempt any 8 questions.*
5. *There is no negative marking.*

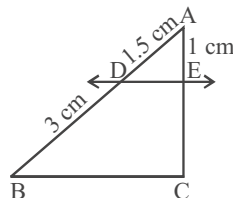
Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

1. A motor boat takes 2 hours to travel a distance 9 km down the current and it takes 6 hours to travel the same distance against the current. The speed of the boat in still water and that of the current (in km/hour) respectively are
(a) 3, 1.5 (b) 3, 2 (c) 3.5, 2.5 (d) 3, 1
2. The probability of raining on day 1 is 0.2 and on day 2 is 0.3. The probability of raining on both the days is
(a) 0.2 (b) 0.1 (c) 0.06 (d) 0.25
3. Which of the following statement is false?
(a) All isosceles triangles are similar. (b) All quadrilateral triangles are similar.
(c) All circles are similar. (d) None of the above
4. A race track is in the form of a ring whose inner and outer circumference are 437m and 503m respectively. The area of the track is
(a) 66 sq. cm (b) 4935 sq. cm (c) 9870 sq. cm (d) None of these
5. Which of the following will have a terminating decimal expansion?
(a) $\frac{77}{210}$ (b) $\frac{23}{30}$ (c) $\frac{125}{441}$ (d) $\frac{23}{8}$
6. If $\tan^2\theta = 1 - e^2$, then the value of $\sec\theta + \tan^3\theta \operatorname{cosec}\theta$ is equal to
(a) $(1 - e^2)^{1/2}$ (b) $(2 - e^2)^{1/2}$ (c) $(2 - e^2)^{3/2}$ (d) $(1 - e^2)^{3/2}$
7. I. The L.C.M. of x and 18 is 36.
II. The H.C.F. of x and 18 is 2.
What is the number x ?
(a) 1 (b) 2 (c) 3 (d) 4

8. Which of the following cannot be the probability of an event?
 (a) $2/3$ (b) $-1/5$ (c) 15% (d) 0.7
9. P, Q, R are three collinear points. The coordinates of P and R are $(3, 4)$ and $(11, 10)$ respectively and PQ is equal to 2.5 units. Coordinates of Q are
 (a) $(5, 11/2)$ (b) $(11, 5/2)$ (c) $(5, -11/2)$ (d) $(-5, 11/2)$
10. A number lies between 300 and 400 . If the number is added to the number formed by reversing the digits, the sum is 888 and if the unit's digit and the ten's digit change places, the new number exceeds the original number by 9 . Then, the number is
 (a) 339 (b) 341 (c) 378 (d) 345
11. In the given figure, express x in terms of a, b and c .



- (a) $x = \frac{ab}{a+b}$ (b) $x = \frac{ac}{b+c}$ (c) $x = \frac{bc}{b+c}$ (d) $x = \frac{ac}{a+c}$
12. A fraction becomes 4 when 1 is added to both the numerator and denominator and it becomes 7 when 1 is subtracted from both the numerator and denominator. The numerator of the given fraction is
 (a) 2 (b) 3 (c) 5 (d) 15
13. The sum of the areas of two circles, which touch each other externally, is 153π . If the sum of their radii is 15 , then the ratio of the larger to the smaller radius is
 (a) $4 : 1$ (b) $2 : 1$ (c) $3 : 1$ (d) None of these
14. The zeroes of the polynomial $x^2 - 3x - m(m+3)$ are
 (a) $m, m+3$ (b) $-m, m+3$ (c) $m, -(m+3)$ (d) $-m, -(m+3)$
15. If $\operatorname{cosec} x + \sin x = a$ and $\sec x - \cos x = b$, then
 (a) $(a^2b)^{\frac{2}{3}} + (ab^2)^{\frac{2}{3}} = 1$ (b) $(ab^2)^{\frac{2}{3}} + (a^2b^2)^{\frac{2}{3}} = 1$
 (c) $a^2 + b^2 = 1$ (d) $b^2 - a^2 = 1$
16. If a and b are zeroes of the polynomial $2t^2 - 4t + 3$, then the value of $a^2b + ab^2$ is :
 (a) $\frac{3}{4}$ (b) 2 (c) 3 (d) 4
17. In the given figure, $DE \parallel BC$. The value of EC is



- (a) 1.5 cm (b) 3 cm (c) 2 cm (d) 1 cm

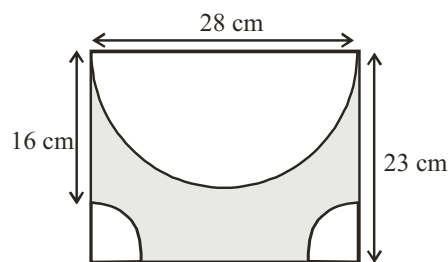
18. The number $3^{13} - 3^{10}$ is divisible by
 (a) 2 and 3 (b) 3 and 10 (c) 2, 3 and 10 (d) 2, 3 and 13
19. At present ages of a father and his son are in the ratio 7 : 3, and they will be in the ratio 2 : 1 after 10 years. Then the present age of father (in years) is
 (a) 42 (b) 56 (c) 70 (d) 77
20. The probability that a two digit number selected at random will be a multiple of '3' and not a multiple of '5' is
 (a) $\frac{2}{15}$ (b) $\frac{4}{15}$ (c) $\frac{1}{15}$ (d) $\frac{4}{90}$

SECTION-B

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

21. If the sum of the circumferences of two circles with diameters d_1 and d_2 is equal to the circumference of a circle of diameter d , then
 (a) $d_1^2 + d_2^2 = d^2$ (b) $d_1 + d_2 = d$ (c) $d_1 + d_2 > d$ (d) $d_1 + d_2 < d$
22. The zeroes of the polynomial are
 $p(x) = x^2 - 10x - 75$
 (a) 5, -15 (b) 5, 15 (c) 15, -5 (d) -5, -15
23. If $\operatorname{cosec} x - \cot x = \frac{1}{3}$, where $x \neq 0$, then the value of $\cos^2 x - \sin^2 x$ is
 (a) $\frac{16}{25}$ (b) $\frac{9}{25}$ (c) $\frac{8}{25}$ (d) $\frac{7}{25}$
24. Factor of the polynomial $x^3 - 3x^2 - 10x + 24$ are:
 (a) $(x - 2)(x + 3)(x - 4)$ (b) $(x + 2)(x + 3)(x + 4)$
 (c) $(x + 2)(x - 3)(x - 4)$ (d) $(x - 2)(x - 3)(x - 4)$
25. The points (7, 2) and (-1, 0) lie on a line
 (a) $7y = 3x - 7$ (b) $4y = x + 1$
 (c) $y = 7x + 7$ (d) $x = 4y + 1$
26. X's salary is half that of Y's. If X got a 50% rise in his salary and Y got 25% rise in his salary, then the percentage increase in combined salaries of both is
 (a) 30 (b) $33\frac{1}{3}$ (c) $37\frac{1}{2}$ (d) 75
27. The perimeter of a sector of a circle with central angle 90° is 25 cm. Then the area of the minor segment of the circle is.
 (a) 14 cm^2 (b) 16 cm^2 (c) 18 cm^2 (d) 24 cm^2
28. The perimeters of two similar triangles ABC and PQR are respectively 36 cm and 24 cm. If $PQ = 10$ cm, then $AB =$
 (a) 10 cm (b) 20 cm (c) 25 cm (d) 15 cm
29. If $\tan \theta = \frac{a \sin \phi}{1 - a \cos \phi}$ and $\tan \phi = \frac{b \sin \theta}{1 - b \cos \theta}$, then $\frac{a}{b} =$
 (a) $\frac{\sin \theta}{1 - \cos \theta}$ (b) $\frac{\sin \theta}{1 - \cos \phi}$ (c) $\frac{\sin \phi}{\sin \theta}$ (d) $\frac{\sin \theta}{\sin \phi}$

30. The least number which when divided by 15, leaves a remainder of 5, when divided by 25, leaves a remainder of 15 and when divided by 35, leaves a remainder of 25, is
 (a) 515 (b) 525 (c) 1040 (d) 1050
31. Out of one digit prime numbers, one number is selected at random. The probability of selecting an even number is
 (a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{4}{9}$ (d) $\frac{2}{5}$
32. A can do a piece of work in 24 days. If B is 60% more efficient than A , then the number of days required by B to do the twice as large as the earlier work is
 (a) 24 (b) 36 (c) 15 (d) 30
33. The area of a right angled isosceles triangle whose hypotenuse is equal to 270 m is-
 (a) 19000 m² (b) 18225 m² (c) 17256 m² (d) 18325 m²
34. If n is an even natural number, then the largest natural number by which $n(n+1)(n+2)$ is divisible is
 (a) 6 (b) 8 (c) 12 (d) 24
35. $(\cos^4 A - \sin^4 A)$ is equal to
 (a) $1 - 2 \cos^2 A$ (b) $2 \sin^2 A - 1$
 (c) $\sin^2 A - \cos^2 A$ (d) $2 \cos^2 A - 1$
36. The least number which is a perfect square and is divisible by each of 16, 20 and 24 is
 (a) 240 (b) 1600 (c) 2400 (d) 3600
37. It is given that $\triangle ABC \sim \triangle PQR$ with $\frac{BC}{QR} = \frac{1}{3}$. Then $\frac{\text{ar}(\triangle PQR)}{\text{ar}(\triangle ABC)}$ is equal to
 (a) 9 (b) 3 (c) $\frac{1}{3}$ (d) $\frac{1}{9}$
38. The figure given shows a rectangle with a semi-circle and 2 identical quadrants inside it.



What is the shaded area of the figure? (Use $\pi = \frac{22}{7}$)

- (a) 363 cm² (b) 259 cm² (c) 305 cm² (d) 216 cm²
39. The value of k for which the system of linear equations $x + 2y = 3$, $5x + ky + 7 = 0$ is inconsistent is
 (a) $-\frac{14}{3}$ (b) $\frac{2}{5}$ (c) 5 (d) 10
40. The probability of getting a number greater than 2 in throwing a die is
 (a) $\frac{2}{3}$ (b) $\frac{1}{3}$ (c) $\frac{4}{3}$ (d) $\frac{1}{4}$

SECTION-C

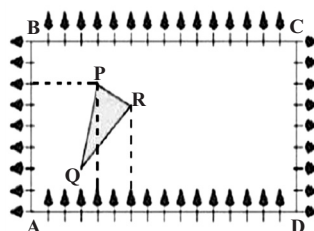
Case Study Based Questions:

Section C consists of 10 questions of 1 mark each. Any 8 questions 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)
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42. What are the coordinates of P?

(a) (4, 6)	(b) (6, 4)	(c) (4, 5)	(d) (5, 4)
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43. What are the coordinates of R?

(a) (6, 5)	(b) (5, 6)	(c) (6, 0)	(d) (7, 4)
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44. What are the coordinates of D?

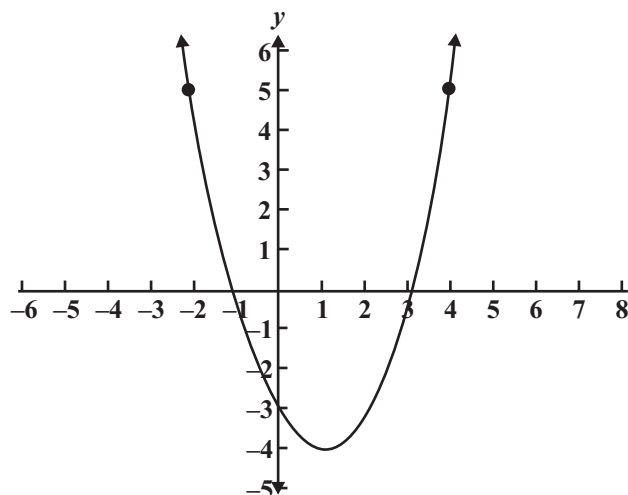
(a) (16, 0)	(b) (0, 0)	(c) (0, 16)	(d) (16, 0)
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45. What are the coordinate of P if D is taken as the origin?

(a) (12, 2)	(b) (-12, 2)	(c) (12, 3)	(d) (6, 10)
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Q 46 - Q 50 are based on case study-II

Case Study-II

Due to heavy storm an electric wire got bent as shown in the figure. It followed a mathematical shape. Answer the following questions below.



46. Name the shape in which the wire is bent

(a) spiral	(b) ellipse	(c) linear	(d) parabola
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47. How many zeroes are there for the polynomial (shape of the wire)?
(a) 2 (b) 3 (c) 1 (d) 0
48. The zeroes of the polynomial are
(a) $-1, 5$ (b) $-1, 3$ (c) $3, 5$ (d) $-4, 2$
49. What will be the expression of the polynomial?
(a) $x^2 + 2x - 3$ (b) $x^2 - 2x + 3$ (c) $x^2 - 2x - 3$ (d) $x^2 + 2x + 3$
50. What is the value of the polynomial if $x = -1$?
(a) 6 (b) -18 (c) 18 (d) 0

OMR ANSWER SHEET

Sample Paper No –

- ★ Use Blue / Black Ball pen only.
- ★ Please do not make any stray marks on the answer sheet.
- ★ Rough work must not be done on the answer sheet.
- ★ Darken one circle deeply for each question in the OMR Answer sheet, as faintly darkened / half darkened circle might be rejected.

Start time : _____ End time _____ Time taken _____

1. Name (in Block Letters)

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2. Date of Exam

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3. Candidate's Signature

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SECTION-A

1.	a	b	c	d	9.	a	b	c	d	17.	a	b	c	d
2.	a	b	c	d	10.	a	b	c	d	18.	a	b	c	d
3.	a	b	c	d	11.	a	b	c	d	19.	a	b	c	d
4.	a	b	c	d	12.	a	b	c	d	20.	a	b	c	d
5.	a	b	c	d	13.	a	b	c	d					
6.	a	b	c	d	14.	a	b	c	d					
7.	a	b	c	d	15.	a	b	c	d					
8.	a	b	c	d	16.	a	b	c	d					

SECTION-B

21.	a	b	c	d	29.	a	b	c	d	37.	a	b	c	d
22.	a	b	c	d	30.	a	b	c	d	38.	a	b	c	d
23.	a	b	c	d	31.	a	b	c	d	39.	a	b	c	d
24.	a	b	c	d	32.	a	b	c	d	40.	a	b	c	d
25.	a	b	c	d	33.	a	b	c	d					
26.	a	b	c	d	34.	a	b	c	d					
27.	a	b	c	d	35.	a	b	c	d					
28.	a	b	c	d	36.	a	b	c	d					

SECTION-C

41.	a	b	c	d	45.	a	b	c	d	49.	a	b	c	d
42.	a	b	c	d	46.	a	b	c	d	50.	a	b	c	d
43.	a	b	c	d	47.	a	b	c	d					
44.	a	b	c	d	48.	a	b	c	d					

No. of Qns. Attempted		Correct		Incorrect		Marks	
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Page for Rough Work
