Sample Paper 7

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.

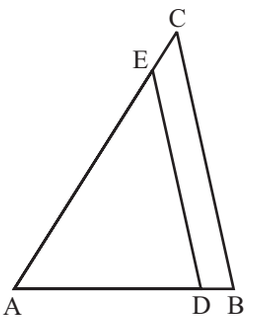
1. The distance between which of the following two points is 2 units?

(a) (–2, –3) and (–2, –4) (b) (0, 4) and (0, 6) (c) (7, 2) and (6, 2) (d) (4, –3) and (2, 3)

2. Which of the following is/are a polynomial?

(a) $x^2 + \frac{1}{x}$ (b) $2x^2 - 3\sqrt{x} + 1$ (c) $x^3 - 3x + 1$ (d) $2x^{\frac{3}{2}} - 5x$

3. In Fig. $DE \parallel BC$. If $AD = x$, $DB = x - 2$, $AE = x + 2$ and $EC = x - 1$, find the value of x.



(a) 4 (b) 7 (c) 5 (d) 2

4. Two dice are rolled, then probability of getting a total of 9 is

(a) $\frac{1}{3}$ (b) $\frac{1}{9}$ (c) $\frac{9}{10}$ (d) $\frac{8}{9}$

5. Which of the following statement(s) is/are always true?

(a) The sum of two distinct irrational numbers is rational.

(b) The rationalising factor of a number is unique.

(c) Every irrational number is a surd.

(d) None of these

6. I. If $x - y = xy = 1 - x - y$, then $x + y$ is $\frac{5}{3}$

II. The system of equations $3x + 2y = a$ and $5x + by = 4$ has infinitely many solutions for x and y, then $a = 4, b = 3$

III. If $\frac{x}{a} + \frac{y}{b} =$ and $ax - by = a^2 - b^2$, then $x = a, y = b$

Which is true?

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

7. If $13 \tan \theta = 12$, then find the value of $\frac{2\sin\theta\cos\theta}{\cos^2\theta - \sin^2\theta}$

(a) $\frac{25}{312}$ (b) $\frac{1}{25}$ (c) $\frac{12}{31}$ (d) $\frac{312}{25}$

8. From a bag containing 100 tickets numbered 1, 2, 3, ..., 100 one ticket is drawn. If the number on this ticket is x, then the probability that $x + \frac{1}{x} > 2$ is .....

(a) 0 (b) 0.99 (c) 1 (d) None of these

9. A right triangle has hypotenuse of length p cm and one side of length q cm. If $p - q = 1$, find the length of the third side of the triangle.

(a) $\sqrt{2q+1}\,cm$ (b) $\sqrt{2(q+1)}\,cm$ (c) $\sqrt{2q}+1\,cm$ (d) $\sqrt{2q}+q^2\,cm$

10. Suppose we have two circles of radius 2 each in the plane such that the distance between their centers is $2\sqrt{3}$. The area of the region common to both circles lies between

(a) 0.5 and 0.6 (b) 0.65 and 0.7 (c) 0.7 and 0.75 (d) 0.8 and 0.9

11. Which of the following statement(s) is/are not correct?

(a) $\frac{7^3}{5^4}$ is a non-terminating repeating decimal.

(b) If $a = 2 + \sqrt{3}$ and $b = \sqrt{2} - \sqrt{3}$, then $a + b$ is irrational.

(c) If 19 divides a^3, then 19 divides a, where a is a positive integer.

(d) Product of L.C.M. and H.C.F. of 25 and 625 is 15625.

12. Which of the following given options is/are correct?

(a) Degree of a zero polynomial is '0'. (b) Degree of a zero polynomial is not defined.

(c) Degree of a constant polynomial is not defined. (d) A polynomial of degree n must have n zeroes.

13. If $\cot\theta = \left(\frac{15}{8}\right)$, then evaluate $\frac{(2+2\sin\theta)\,(1-\sin\theta)}{(1+\cos\theta)\,(2-2\cos\theta)}$

(a) 1 (b) $\frac{225}{64}$ (c) $\frac{156}{7}$ (d) –1

14. A coin is tossed. Then the probability of getting either head or tail is

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

15. Which of the following is / are not correct ?

Three points will form :

(a) an equilateral triangle, if all the three sides are equal.

(b) an isosceles triangle, if any two sides are equal.

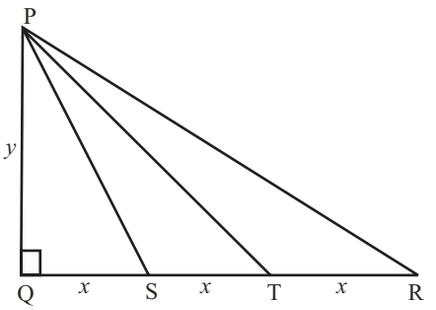
(c) a collinear or a line, if sum of two sides is equal to third side.

(d) a rhombus, if all the four sides are equal.

16. A circle is inscribed in a right angled triangle of perimeter 7π . Then the ratio of numerical values of circumference of the circle to the area of the right angled triangle is

(a) 4 : 7 (b) 3 : 7 (c) 2 : 7 (d) 1 : 7

17. In the given figure, *S* and *T* trisect the side *QR* of a right triangle *PQR*. Then which of the following is correct?



(a) $8PT^2 = 3PR^2 + 5PS^2$ (b) $8PR^2 = 8PT^2 + 8PS^2$ (c) $8PT^2 - 4PR^2 = 6PS^2$ (d) $8PT^2 = 7RP^2 - 6PS^2$

18. The product of unit digit in $(7^{95} - 3^{58})$ and $(7^{95} + 3^{58})$ is

(a) 8 (b) lies between 3 and 7 (c) 6 (d) lies between 3 and 6

19. Which of the following given options is/are correct?

(a) $\frac{2}{x}+3$ is a polynomial (b) $\sqrt{x}+5$ is a polynomial

(c) $\frac{2}{3x-4}$ is a polynomial (d) $\sqrt{5}x^2+\frac{1}{2}x+\frac{3}{7}$ is a polynomial

20. If 5θ and 4θ are acute angles satisfying $\sin 5\theta = \cos 4\theta$, then $2\sin 3\theta - \sqrt{3}\tan 3\theta$ is equal to

(a) $\sin 2\theta$ (b) $\frac{1}{2}$ (c) $\frac{1}{\sqrt{3}}$ (d) 0

SECTION-B

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

21. Which of the following is / are correct?

Four points will form :

(a) a rectangle, if opposite sides and diagonals are not equal.

(b) a parallelogram, if opposite sides are not equal.

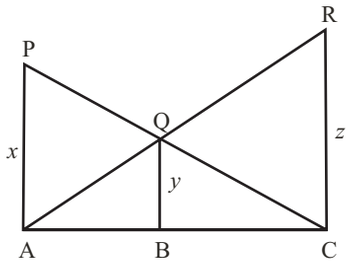
(c) a square, if all the four sides and diagonals are equal.

(d) a right angle triangle, if sum of squares of any two sides is equal to square of third largest side.

22. Two dice are rolled simultaneously. Find the probability that they show different faces.

(a) $\frac{3}{4}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) $\frac{5}{6}$

23. In the given figure PA, QB and RC, each are perpendicular to AC.



Which of the following is correct ?

(a) $y + z = x$ (b) $\frac{1}{x+z} = \frac{1}{y}$ (c) $\frac{1}{y} = \frac{1}{x} + \frac{1}{z}$ (d) None of these

24. If $x = a$, $y = b$ is the solution of the equations $x - y = 2$ and $x + y = 4$, then the values of a and b are, respectively.

(a) 3 and 5 (b) 5 and 3 (c) 3 and 1 (d) – 1 and – 3

25. If the distance between the points (2, –2) and (–1, x) is 5, one of the values of x is

(a) –2 (b) 2 (c) –1 (d) 1

26. How much time the minute hand of a clock will take to describe an angle of $\frac{2\pi}{3}$ radians?

(a) 15 minutes (b) 20 minutes (c) 10 minutes (d) 25 minutes

27. The value of c for which the pair of equations $cx - y = 2$ and $6x + 2y = 3$ will have infinitely many solutions is

(a) 3 (b) – 3 (c) – 12 (d) no value

28. Which of the following is/are not correct?

(a) If the diagonals of a quadrilateral divide each other proportionally, then it is a trapezium.

(b) The line segments joining the mid-points of the adjacent sides of a quadrilateral form a parallelogram.

(c) If corresponding sides of two similar triangles are in the ratio 4 : 5, then corresponding medians of the triangles must be in the ratio 4 : 5.

(d) None of the above

29. A line is of length 10 units and one end is (2, –3). If the abscissa of the other end is 10, what is the ordinate?

(a) 3 or 9 (b) –3 or –9 (c) 3 or –9 (d) –3 or 9

30. The probability of an event can not be

(a) positive (b) negative (c) zero (d) one

31. If $\sin A + \sin^2 A = 1$, then the value of the expression $(\cos^2 A + \cos^4 A)$ is

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

32. Which of the following statement(s) is/are not correct?

(a) There are infinitely many even primes.

(b) Let 'a' be a positive integer and p be a prime number such that a^2 is divisible by p, then a is divisible by p.

(c) Every positive integer different from 1 can be expressed as a product of non-negative power of 2 and an odd number.

(d) If 'p' is a positive prime, then $\sqrt{p}$ is an irrational number.

33. If the radius of a circle is $\frac{7}{\sqrt{\pi}}$ cm, then the area of the circle is equal to

(a) $\frac{49}{\pi}$ cm^2 (b) π cm^2 (c) 154 cm^2 (d) 49 cm^2

34. The zeroes of the quadratic polynomial $x^2 + 99x + 127$ are

(a) both positive (b) both negative

(c) one positive and one negative (d) both equal

35. Which of the following points will be collinear with the points (–3, 4) and (2, –5)?

(a) (0, 0) (b) (7, –14) (c) (0, –1) (d) (3, 1)

36. Given that $\sin\theta = \frac{a}{b}$, then cos θ is equal to

(a) $\frac{b}{\sqrt{b^2 - a^2}}$ (b) $\frac{b}{a}$ (c) $\frac{\sqrt{b^2 - a^2}}{b}$ (d) $\frac{a}{\sqrt{b^2 - a^2}}$

37. Which of the following statement(s) is/are not correct?

(a) Every integer is a rational number.

(b) The sum of a rational number and an irrational number is an irrational number.

(c) Every real number is rational.

(d) Every point on a number line is associated with a real number.

38. A die is thrown once then,

(a) the probability of getting an odd number is $\frac{2}{3}$ (b) the probability of getting multiple of 3 is 1/3

(c) the probability of getting a prime number is 2/3 (d) the probability of getting number greater than 5 is 1/3

39. Two triangles are similar if

(a) their corresponding angles are equal. (b) their corresponding sides are equal.

(c) both are right triangle. (d) None of the above

40. A circle drawn with origin as the centre passes through $\left(\frac{13}{4}, 0\right)$. The point which does not lie in the interior of the circle is

(a) $\left(\frac{-3}{4}, 1\right)$ (b) $\left(2, \frac{7}{3}\right)$ (c) $\left(3, \frac{-1}{2}\right)$ (d) $\left(-6, \frac{5}{2}\right)$

SECTION-C

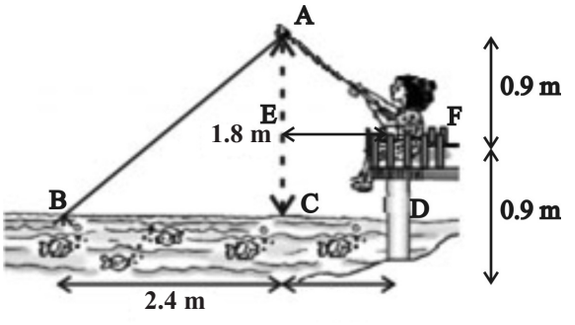
Case Study Based Questions:

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

Nazima is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod. Assuming that her string (from the tip of her rod to the fly) is taut shown in figure.



Answer the following questions.

41. How much string does she have out?

(a) 1 m (b) 2 m (c) 3 m (d) 4 m

42. Find the length of CD.

(a) 1 m (b) 1.2 m (c) 1.5 m (d) 2 m

43. Find the length of her fishing rod.

(a) 1.5 m (b) 1.2 m (c) 1 m (d) 0.8 m

44. Both triangles are similar by similarity criterion is:

(a) AAA (b) SSS (c) ASA (d) SAS

45. If she pulls in the string at the rate of 5 cm per second, then time taken to pulls all string.

(a) 1 min. (b) 30 sec. (c) 30 min. (d) 40 sec.

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

Case Study-II

A horse is tied to a peg at one corner of a square shaped grass field of side 15m. (Use $\pi = 3.14$)

Then answer the following questions.

46. If rope of horse is 5m long then the area of that part of the field in which the horse can graze is :

(a) $19.625m^2$ (b) $29.625m^2$ (c) $19\ m^2$ (d) $18.625m^2$

47. If rope of horse 10 m long then the area of that part of the field in which the horse can graze is:

(a) $68.5m^2$ (b) $78.5m^2$ (c) $58.5m^2$ (d) $73.5m^2$

48. The increase in the grazing area if the rope were 10m long instead of 5m.

(a) $58.875m^2$ (b) $58m^2$ (c) $57.875m^2$ (d) $68.87\ m^2$

49. If rope of horse is 5 m long then the area of that part of the field in which the horse can not graze is:

(a) $204.37m^2$ (b) $200.37m^2$ (c) $205.37m^2$ (d) $205m^2$

50. If rope of horse 10m long then the area of that part of the field in which the horse can not graze is :

(a) $146.5\ m^2$ (b) $205.37m^2$ (c) $46.5m^2$ (d) $146\ m^2$

OMR ANSWER SHEET

Sample Paper No – ☐

- ✶ Use Blue / Black Ball pen only.
- ✶ Please do not make any atray 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 darkend / half darkened circle might by 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 ☐

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	

Page for Rough Work