

**Time Allowed: 1 hour and 30 minutes**

**Maximum Marks: 40**

**General Instructions:**

- The question paper contains three parts A, B and C.
- Section A consists of 20 questions of 1 mark each. Attempt any 16 questions.
- Section B consists of 20 questions of 1 mark each. Attempt any 16 questions.
- Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.
- There is no negative marking.

#### Section A

#### Attempt any 16 questions

- Which of the following rational numbers have terminating decimal? [1]

a) $\frac{7}{250}$	b) $\frac{16}{225}$
c) $\frac{5}{18}$	d) $\frac{2}{21}$
- The area of the triangle formed by  $x + 3y = 6$ ,  $2x - 3y = 12$  and the y-axis is [1]

a) 15 sq. units	b) 18 sq. units
c) 16 sq. units	d) 12 sq. units
- The zeroes of the polynomial  $x^2 - 3x - m(m + 3)$  are: [1]

a) $-m, -(m + 3)$	b) $m, -(m + 3)$
c) $-m, m + 3$	d) $m, m + 3$
- The value of k for which the system of equations  $x + y - 4 = 0$  and  $2x + ky = 3$  has no solution, is: [1]

a) 3	b) -2
c) 4	d) 2
- $\sqrt{\frac{1+\cos A}{1-\cos A}} = ?$  [1]

a) $\operatorname{cosec} A - \cot A$	b) None of these
c) $\operatorname{cosec} A + \cot A$	d) $\operatorname{cosec} A \cot A$
- What is the largest number that divides each one of 1152 and 1664 exactly? [1]

a) 64	b) 256
c) 128	d) 32
- The zeros of the quadratic polynomial  $x^2 + 88x + 125$  are [1]

a) both negative

b) both positive

c) both equal

d) one positive and one negative

8. If  $x$  is a positive integer such that the distance between points  $P(x, 2)$  and  $Q(3, -6)$  is 10 units, [1]  
then  $x =$

a) 3

b) 9

c) -9

d) -3

9. If  $\alpha, \beta$  are the zeros of the polynomial  $p(x) = 4x^2 + 3x + 7$ , then  $\frac{1}{\alpha} + \frac{1}{\beta}$  is equal to [1]

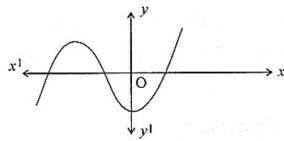
a)  $\frac{3}{7}$

b)  $-\frac{3}{7}$

c)  $-\frac{7}{3}$

d)  $\frac{7}{3}$

10. The graph of a polynomial is shown in Figure, then the number of its zeroes is: [1]



a) 4

b) 3

c) 1

d) 2

11. A die has its six faces marked 1, 2, 2, 2, 5, 6. The probability of getting 2 is [1]

a)  $\frac{1}{2}$

b)  $\frac{1}{5}$

c)  $\frac{1}{4}$

d)  $\frac{1}{3}$

12. The decimal expansion of the rational number  $\frac{14587}{1250}$  will terminate after [1]

a) 4 decimal places

b) 1 decimal place

c) 3 decimal places

d) 2 decimal places

13. A line intersects the y-axis and x-axis at the points  $P$  and  $Q$ , respectively. If  $(2, -5)$  is the mid-point of  $PQ$ , then the coordinates of  $P$  and  $Q$  are, respectively [1]

a)  $(0, -5)$  and  $(2, 0)$

b)  $(0, 4)$  and  $(-10, 0)$

c)  $(0, 10)$  and  $(-4, 0)$

d)  $(0, -10)$  and  $(4, 0)$

14.  $(0, 3), (4, 0)$  and  $(-4, 0)$  are the vertices of [1]

a) a right triangle

b) an isosceles triangle

c) a scalene triangle

d) an equilateral triangle

15. If one zero of the polynomial  $f(x) = (k^2 + 4)x^2 + 13x + 4k$  is reciprocal of the other, then  $k =$  [1]

a) 1

b) -1

c) 2

d) -2

16. If  $x = r \sin \theta \cos \phi$ ,  $y = r \sin \theta \sin \phi$  and  $z = r \cos \theta$ , then [1]

a)  $x^2 + y^2 + z^2 = r^2$

b)  $x^2 - y^2 + z^2 = r^2$

c)  $z^2 + y^2 - x^2 = r^2$

d)  $x^2 + y^2 - z^2 = r^2$

17. The sum of two numbers is 8. If their sum is four times their difference, then the numbers are [1]



28. The coordinates of the point which divides the join of (-6, 10) and (3, -8) in the ratio 2 : 7 is **[1]**  
a) (4, -6) b) (-4, 6)  
c) (1, -3) d) (-1, 3)
29. The value of  $\sin 45^\circ + \cos 45^\circ$  is **[1]**  
a)  $\sqrt{2}$  b)  $\frac{1}{\sqrt{2}}$   
c) 1 d)  $\frac{1}{\sqrt{3}}$
30. Given that  $2x + 3y = 11$ ,  $2x - 4y = -24$  and  $y = mx + 3$ , then the value of m is **[1]**  
a) 2 b) 0  
c)  $m = -1$  d) 1
31. If two positive integers p and q can be expressed as  $p = ab^2$  and  $q = a^3 b$ ; a, b being prime numbers, then LCM (p, q) is **[1]**  
a)  $a^3 b^3$  b)  $a^3 b^2$   
c)  $a^2 b^2$  d) ab
32. If S is a point on side PQ of a  $\triangle PQR$  such that  $PS = QS = RS$ , then **[1]**  
a)  $PS^2 + RS^2 = PR^2$  b)  $PQ^2 + QR^2 = PS^2$   
c)  $QS^2 + RS^2 = QR$  d)  $PR^2 + QR^2 = PQ^2$
33.  $\frac{\sin \theta}{1 + \cos \theta}$  is equal to **[1]**  
a)  $\frac{1 - \sin \theta}{\cos \theta}$  b)  $\frac{1 - \cos \theta}{\cos \theta}$   
c)  $\frac{1 - \cos \theta}{\sin \theta}$  d)  $\frac{1 + \cos \theta}{\sin \theta}$
34. The points A(9, 0), B(9, 6), C(-9, 6) and D(-9, 0) are the vertices of a **[1]**  
a) rhombus b) trapezium  
c) rectangle d) square
35. From a well shuffled pack of 52 cards, one card is drawn at random. The probability of getting a jack of hearts is **[1]**  
a)  $\frac{2}{52}$  b)  $\frac{6}{52}$   
c)  $\frac{1}{52}$  d)  $\frac{4}{52}$
36. A pair of linear equations which has a unique solution  $x = 2$ ,  $y = -3$  is **[1]**  
a)  $x - 4y - 14 = 0$  b)  $2x - y = 1$   
 $5x - y + 13 = 0$   $3x + 2y = 0$   
c)  $x + y = -1$  d)  $2x + 5y = -11$   
 $2x - 3y = -5$   $4x + 10y = -22$
37. If 3 is the least prime factor of number 'a' and 7 is the least prime factor of number 'b', then the least prime factor of  $a + b$ , is **[1]**  
a) 3 b) 10

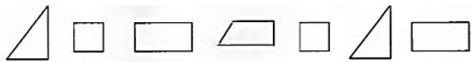
- c) 5 d) 2
38. If  $2 \sin 2\theta = \sqrt{3}$  then  $\theta = ?$  [1]
- a)  $45^\circ$  b)  $90^\circ$
- c)  $60^\circ$  d)  $30^\circ$
39. Two dice are thrown simultaneously. The probability that the sum of the numbers appearing on the dice is 1 is [1]
- a) 3 b) 0
- c) 2 d) 1
40. The perimeter of the triangle formed by the points (0, 0), (1, 0) and (0, 1) is [1]
- a)  $2 + \sqrt{2}$  b) 3
- c)  $\sqrt{2} + 1$  d)  $1 \pm \sqrt{2}$

**Section C**

**Attempt any 8 questions**

**Question No. 41 to 45 are based on the given text. Read the text carefully and answer the questions:**

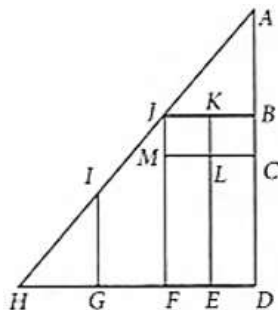
In a classroom, students were playing with some pieces of cardboard as shown below.



All of a sudden, teacher entered into classroom. She told students to arrange all pieces. On seeing this beautiful image, she observed that  $\triangle ADH$  is right angled triangle, which contains

- i. right triangles ABJ and IGH.
- ii. quadrilateral GFJI
- iii. squares JKLM and LCBK
- iv. rectangles MLEF and LCDE.

After observation, she ask certain questions to students.



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41. If an insect (small ant) walks 24 m from H to F, then walks 6 m to reach at M, then walks 4 m to reach at L and finally crossing K, reached at J. Find the distance between initial and final position of insect. [1]
- a) 28 m b) 25 m
- c) 27 m d) 26 m
42. If m, n and r are the sides of right triangle ABJ, then which of the following can be correct? [1]

a)  $m^2 + n^2 + r^2 = 0$

b)  $m^2 + n^2 = 2r^2$

c) none of these

d)  $m^2 + n^2 = r^2$

43. If  $\triangle ABJ \sim \triangle ADH$ , then which similarity criterion is used here? [1]

a) SAS

b) AA

c) SSS

d) AAS

44. If  $\triangle ABJ = 90^\circ$  and B, J are mid points of sides AD and AH respectively and  $BJ \parallel DH$ , then which of the following option is false? [1]

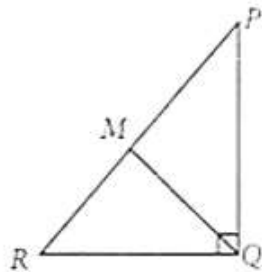
a)  $\triangle ABJ \sim \triangle ADH$

b)  $2BJ = DH$

c)  $\frac{AB}{BD} = \frac{AJ}{AH}$

d)  $AJ^2 = JB^2 + AB^2$

45. If  $\triangle PQR$  is right triangle with  $QM \perp PR$ , then which of the following is not correct? [1]



a)  $PR^2 = PQ + QR$

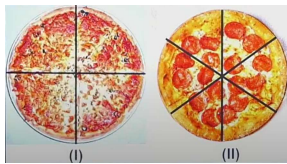
b)  $\triangle PMQ \sim \triangle QMR$

c)  $\triangle PMQ \sim \triangle PQR$

d)  $QR^2 = PR^2 - PQ^2$

**Question No. 46 to 50 are based on the given text. Read the text carefully and answer the questions:**

A group of friends ordered two pizzas for them. One of them was divided into four equal parts while the other in six equal parts. The pizzas were served in pans, exactly the size of the pizza, having a diameter of 35 cm each.



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46. The area of the pan covered by one part of pizza-I is: [1]

a)  $962.5 \text{ cm}^2$

b)  $240.625 \text{ cm}^2$

c)  $481.25 \text{ cm}^2$

d)  $120.32 \text{ cm}^2$

47. The area of the pan covered by each part of pizza II is: [1]

a)  $481.25 \text{ cm}^2$

b)  $240.625 \text{ cm}^2$

c)  $962.5 \text{ cm}^2$

d)  $160.42 \text{ cm}^2$

48. The circumference of the pan is: [1]

a) 110 cm

b) 3850 cm

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c) 220 cm

d) 440 cm

49. The ratio of the area of two circles when the ratio of the circumference is 3:1 will be: [1]

a) 1:3

b) 9:1

c) 3:1

d) 1:9

50. The area of a sector of a circle with a central angle  $20^\circ$  and radius  $2r$  units is given by: [1]

a)  $\frac{2}{9}\pi r^2$

b)  $\frac{1}{16}\pi r^2$

c)  $\frac{1}{18}\pi r^2$

d)  $\frac{1}{9}\pi r^2$

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