

# TERM-1

## SAMPLE PAPER

### AG-TMC-TS-J

# MATHEMATICS

## (STANDARD)

Time Allowed: 90 Minutes

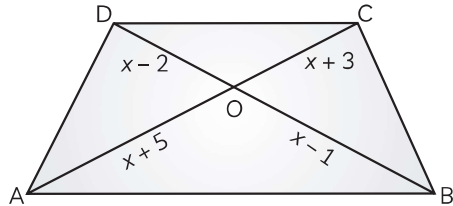
Maximum Marks: 40

**General Instructions:** Same instructions as given in the Sample Paper 1.

### SECTION - A

16 Marks

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

- The ratio of HCF and LCM of numbers 28 and 32 is:  
 (a) 4 : 27 (b) 1 : 56  
 (c) 56 : 1 (d) 27 : 4
- In a group of three friends, the probability of two friends not having the same birthday is 0.992. Then, what is the probability that the two friends have the same birthday?  
 (a) 0.001 (b) 0.008  
 (c) 0.007 (d) 0.006
- What is the length of side AC in  $\triangle ABC$ , which is right angled at B if  $BC = 5$  cm and  $\angle BAC = 30^\circ$ ?  
 (a) 5 cm (b) 15 cm  
 (c) 10 cm (d) 7 cm
- Consider an isosceles right angled triangle  $\triangle ABC$  at C, then  $AB^2 = \dots\dots\dots$  times  $AC^2$ .  
 (a) 1 (b) 2  
 (c) 3 (d) 4
- If the zeroes of the polynomial  $x^2 - 2kx + 2$  are equal in magnitude but opposite in sign, then the value of  $k$  is:  
 (a) 0 (b) 1  
 (c) 2 (d) 3
- What is the distance of the point  $P(3, -4)$  from the origin?  
 (a) 3 units (b) 4 units  
 (c) 5 units (d) 6 units
- Evaluate the approximate area covered by hour hand in 1 hour, where the length of hour hand of a clock is 7 cm.  
 (a)  $9 \text{ cm}^2$  (b)  $11 \text{ cm}^2$   
 (c)  $13 \text{ cm}^2$  (d)  $15 \text{ cm}^2$
- Find the value of  $y$ , from the equations  $x - y = 0.9$  and  $\frac{11}{x + y} = 2$ .  
 (a) 1.2 (b) 2.1  
 (c) 3.2 (d) 2.3
- Evaluate for  $x$ , if  $AB \parallel DC$  in the given figure.  
  
 (a) 6 (b) 7  
 (c) 8 (d) 4
- What is the area of a square inscribed in a circle having diameter  $p$  cm?  
 (a)  $\frac{p^2}{2} \text{ cm}^2$  (b)  $p^2 \text{ cm}^2$   
 (c)  $\frac{\pi p^2}{2} \text{ cm}^2$  (d)  $\pi p^2 \text{ cm}^2$



11. The HCF of co-prime numbers 17 and 43 is:  
 (a) 7 (b) 6  
 (c) 1 (d) 3
12. In  $\triangle ABC$ , D and E are points on sides AB and AC respectively such that  $DE \parallel BC$ . If  $AE = 1.8$  cm,  $BD = 7.2$  cm and  $CE = 5.4$  cm, then the length of AD is:  
 (a) 3.6 cm (b) 2.8 cm  
 (c) 2.4 cm (d) 1.8 cm
13. If  $\alpha$  and  $\beta$  are the zeroes of a polynomial  $x^2 - 3x - 4$ , then the polynomial whose zeroes are  $(\alpha + \beta)$  and  $\alpha\beta$  is:  
 (a)  $x^2 - x + 12$  (b)  $x^2 + x - 12$   
 (c)  $x^2 - x - 12$  (d)  $x^2 + x + 12$
14. What is the probability of getting a consonant, when a letter of English alphabet is chosen at random?  
 (a)  $\frac{5}{26}$  (b)  $\frac{21}{26}$   
 (c)  $\frac{19}{26}$  (d)  $\frac{17}{26}$
15. If AD is a median of  $\triangle ABC$  with vertices A (5, -7), B (4, 7) and C (6, -5), then what are the coordinates of D?  
 (a) (5, 1) (b) (-1, 1)  
 (c) (-5, 1) (d) (1, 1)
16. Evaluate for what value of k, the system of equations  $2x - y = 5$  and  $6x + ky = 15$  has infinitely many solutions.
- (a) 8 (b) -3  
 (c) 3 (d) 6
17. A situation is given. Represent it in the form of linear equations. 5 books and 7 pens together cost ₹ 79 whereas 7 books and 5 pens together cost ₹ 77. Here consider cost of each book as ₹ x and that of each pen as ₹ y.  
 (a)  $17x + 7y = 79, 5x + 5y = 77$   
 (b)  $5x + 7y = 79, 7x + 5y = 77$   
 (c)  $5x + 5y = 79, 7x + 7y = 77$   
 (d) Data insufficient
18. Given two triangles ABC and DEF such that  $\triangle ABC \sim \triangle DEF$ . Also,  $ar(\triangle ABC) = 25$  cm<sup>2</sup>,  $ar(\triangle DEF) = 64$  cm<sup>2</sup> and  $AB = 5$  cm. Then length of side DE is:  
 (a) 8 cm (b) 10 cm  
 (c) 4 cm (d) 12 cm
19. The product of  $(3 + \sqrt{3})$  and  $(3 - \sqrt{5})$  is:  
 (a) a rational number  
 (b) an irrational number  
 (c) a prime number  
 (d) a co-prime number
20.  $0x^2 + 2x - 5$  is an example of a:  
 (a) cubic polynomial  
 (b) quadratic polynomial  
 (c) linear polynomial  
 (d) quadratic equation

## SECTION - B

16 Marks

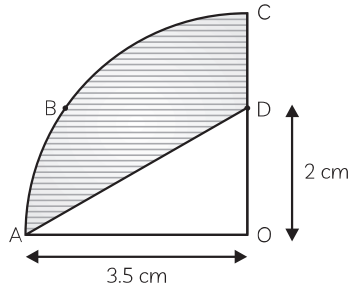
(Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.)

21. A girl of height 90 cm is standing near a lamp-post. Now, she starts walking away from the base of a lamp post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, then what is the length of her shadow after 4 seconds?  
 (a) 1.6 m (b) 1.5 m  
 (c) 3 m (d) 2 m
22. In the figure, OABC is rhombus and O is the origin. If the coordinates of A and C are (a, 0) and (s, t), respectively, then the coordinates of B are:
- 
- (a) (s, a + t) (b) (a, s + t)  
 (c) (a + s, t) (d) (s + t, a)
23. If  $\alpha$  and  $\beta$  are the zeroes of the polynomial  $p(x) = x^2 - 5x + k$  and  $\alpha - \beta = 1$ , then the value of k is:  
 (a) 7 (b) 6  
 (c) 5 (d) 4
24. For two linear equations  $a_1x + b_1y + c_1 = 0$  and  $a_2x + b_2y + c_2 = 0$ , the condition  $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$  is for:  
 (a) Unique solution  
 (b) Infinite solutions  
 (c) No solution  
 (d) Data insufficient
25. What is the probability of getting the sum of perfect square, in a single throw of a pair of dice?  
 (a)  $\frac{1}{36}$  (b)  $\frac{5}{36}$   
 (c)  $\frac{7}{36}$  (d)  $\frac{11}{36}$

26. Evaluate  $\sin \theta \cdot \cos \theta$ , if  $\sin \theta + \cos \theta = \sqrt{2}$ .

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

27. The area of shaded region in the given figure is:



- (a)  $6.125 \text{ cm}^2$  (b)  $5.5 \text{ cm}^2$   
(c)  $2.625 \text{ cm}^2$  (d)  $12.25 \text{ cm}^2$

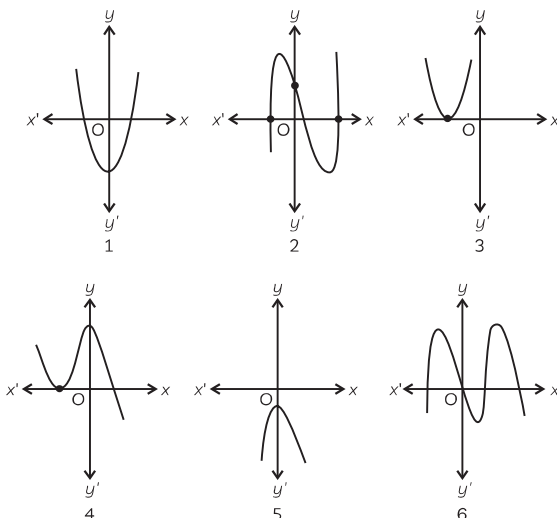
28. Evaluate the least number which when divided by the numbers 18, 24, 30 and 42 leaves a remainder of 1.

- (a) 4221 (b) 2521  
(c) 3862 (d) 1221

29. The decimal expansion of  $\frac{17}{125}$  is:

- (a) 0.017 (b) 0.136  
(c) 0.68 (d) 4.25

30. The graph of a polynomial function is a smooth continuous curve. By looking at graph, we can find the number of zeros of the polynomial. Graphs are the geometrical meaning of the polynomials. They help us to understand their type, nature of its zeroes and coefficients of its various terms.



Which of the above graph represent quadratic polynomials?

- (a) 1 and 3 (b) 1, 3 and 5  
(c) Only 5 (d) Only 6

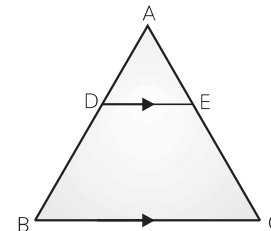
31. If  $a + b + c = 0$  and  $A(a, b)$ ,  $B(b, c)$  and  $C(c, a)$  are vertices of  $\triangle ABC$ , then the coordinates of its centroid are:

- (a)  $\left(\frac{a+b+c}{2}, \frac{a+b+c}{2}\right)$   
(b)  $\left(\frac{a+b+c}{3}, \frac{a+b+c}{3}\right)$   
(c) (1, 1)  
(d) (0, 0)

32. If a number is selected at random from the numbers 1 to 30, then the probability that it is a prime number, is:

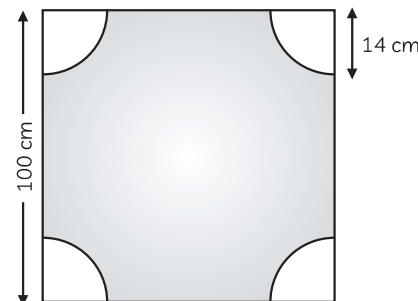
- (a)  $\frac{1}{2}$  (b)  $\frac{2}{5}$   
(c)  $\frac{1}{3}$  (d)  $\frac{3}{4}$

33. In the figure,  $DE \parallel BC$ . If  $AD = 1 \text{ cm}$  and  $BD = 2 \text{ cm}$ , then the ratio of areas of  $\triangle ADE$  and  $\triangle ABC$  is:



- (a) 1 : 4 (b) 1 : 2  
(c) 2 : 3 (d) 1 : 9

34. Find the area of shaded region in the given figure in which the square is of side 100 cm and quadrant of radius 14 cm is formed at four corners.



- (a)  $9384 \text{ cm}^2$  (b)  $8998 \text{ cm}^2$   
(c)  $9212 \text{ cm}^2$  (d)  $9656 \text{ cm}^2$

35. Evaluate one of the common solution of  $ax + by = c$  and  $y$ -axis?

- (a) (0, b) (b)  $\left(0, \frac{c}{b}\right)$   
(c)  $\left(0, \frac{a}{c}\right)$  (d) (0, 0)

36. The graphical representation of  $x - 2y + 4 = 0$  and  $x + 4y + 2 = 0$  will be:  
 (a) coincident lines  
 (b) parallel lines  
 (c) intersecting lines  
 (d) Data insufficient
37. Which of the following is an example of non-terminating decimal?  
 (a)  $\frac{5}{8}$   
 (b)  $\frac{9}{640}$   
 (c)  $\frac{4}{45}$   
 (d)  $\frac{1}{25}$
38. If  $x = 2$  is a zero of polynomial  $ax^2 - bx + 2$ , then what is the relation between  $a$  and  $b$ ?  
 (a)  $2a - b + 1 = 0$   
 (b)  $a + b + 1 = 0$   
 (c)  $a - b + 1 = 0$   
 (d)  $7a - 5b + 1 = 0$
39.  $\triangle ABC \sim \triangle PQR$ . If  $AB = 4$  cm,  $BC = 3$  cm,  $CA = 7$  cm and  $PR = 2$  cm, then the perimeter of  $\triangle PQR$  is:  
 (a) 2 cm  
 (b) 4 cm  
 (c) 14 cm  
 (d) 7 cm
40. If the HCF of 408 and 1032 is expressible in the form  $1032 \times 2 + 408 \times p$ , then the value of  $p$  is:  
 (a) -10  
 (b) -15  
 (c) -5  
 (d) 10

## SECTION - C

8 marks

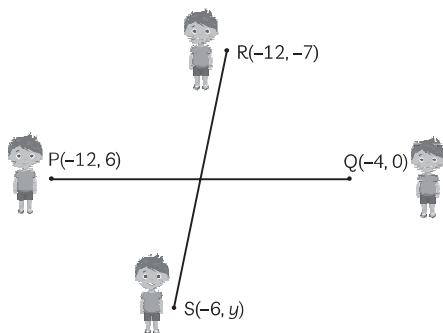
(Case Study Based Questions.)

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

Q. 41-45 are based on case study-1

Case Study-1:

Four friends visited a nearby park to play. They decided to play with the ball. So they get stood the four corners P, Q, R, S of the rectangular park PQRS and started playing pass the ball.



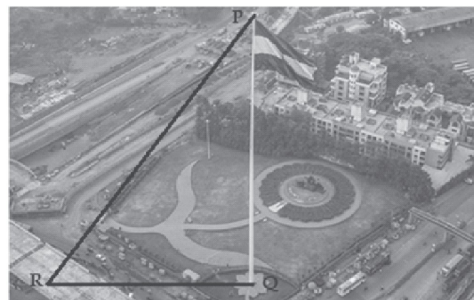
41. If A is the mid-point of P and Q, then find the coordinates of A.  
 (a) (3, -8)  
 (b) (2, -8)  
 (c) (-8, 2)  
 (d) (-8, 3)
42. If  $k : 1$  is the ratio in which point A divides the line RS, then the value of  $k$  is:  
 (a) 5  
 (b) 4  
 (c) 3  
 (d) 2
43. What are the coordinates of the point S?  
 (a) (-6, 9)  
 (b) (-6, 8)  
 (c) (-6, 7)  
 (d) (-6, 6)
44. Calculate the total distance between the points P and Q.  
 (a) 9 units  
 (b) 10 units  
 (c) 8 units  
 (d) 7 units
45. What is the distance between the points S and R?

- (a)  $2\sqrt{29}$  units  
 (b)  $3\sqrt{29}$  units  
 (c)  $\sqrt{26}$  units  
 (d)  $2\sqrt{26}$  units

Q. 46-50 are based on Case Study-2

Case Study-2:

Located in Nigdi, the Bhakti Shakti flag was set up by the Pimpri Chinchwad Municipal Corporation (PCMC) in 2018. The approximately 105 metre high flagpole weighs 42 tonnes and the flag is made up of knitted polyester and the flag itself weighs 90 kg and can sustain winds up to 25 km per hour. The height of the flag is shown in the picture as PQ and the distance between the foot of the flagpole Q and a point R on the ground is 208 m.



46. The value of  $\cos R$  is:  
 (a)  $\frac{105}{233}$   
 (b)  $\frac{105}{208}$   
 (c)  $\frac{208}{105}$   
 (d)  $\frac{208}{233}$
47. The value of  $\sin P$  is:  
 (a)  $\frac{208}{233}$   
 (b)  $\frac{105}{208}$   
 (c)  $\frac{208}{105}$   
 (d)  $\frac{105}{233}$

48. The value of cosec R is:

(a)  $\frac{208}{233}$

(b)  $\frac{233}{105}$

(c)  $\frac{208}{105}$

(d)  $\frac{105}{233}$

49. The value of  $\tan^2 P - \sec^2 P$  is:

(a) 0

(b) 1

(c) -1

(d) 2

50.  $\tan P - \cot R$  is:

(a) 1

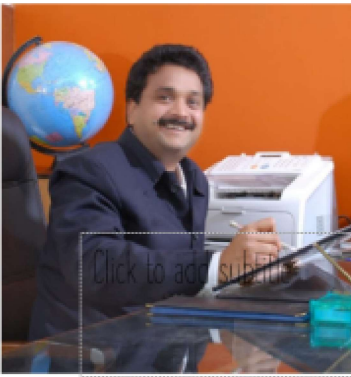
(b) 0

(c) -1

(d) 2

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## Target Mathematics by Dr. Agyat Gupta



## Target Mathematics