

TERM-1

SAMPLE PAPER

CODE- AG-TMC-TS-TERM-1-OOC

MATHEMATICS

(STANDARD)

Time Allowed: 90 Minutes

Maximum Marks: 40

SECTION - A

16 marks

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

- What is the value of k in the quadratic polynomial $3x^2 + 2kx - 3$, if $x = -\frac{1}{2}$ is one of the zeroes of it?

(a) $\frac{1}{5}$	(b) $\frac{3}{2}$
(c) $-\frac{1}{4}$	(d) $-\frac{9}{4}$
- A circle, has its centre at $(-1, 3)$. If one end of a diameter of the circle has co-ordinates $(2, 5)$, then find the co-ordinates of the other end of the diameter.

(a) $(-4, 1)$	(b) $(1, 8)$
(c) $(0.5, 4)$	(d) $(-1, 4)$
- Evaluate $\frac{1 + \tan^2 A}{1 + \cot^2 A}$

(a) $\sec^2 A$	(b) -1
(c) $\cot^2 A$	(d) $\tan^2 A$
- What is value of $x + y$, if $\triangle ABC$ and $\triangle PQR$ are similar?

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- | | |
|-------------|-------------|
| (a) 12.8 cm | (b) 14.3 cm |
| (c) 12.5 cm | (d) 14 cm |
- If we toss two unbiased coins simultaneously, then the probability of getting no head is $\frac{A}{B}$. Then $(A + B)^2$ will be equal to:

(a) 21	(b) 25	(c) 10	(d) 5
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- What is the smallest number by which $\frac{891}{3500}$ must be multiplied so it becomes a terminating decimal?

(a) 6	(b) 7	(c) 10	(d) 5
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- 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) 2	(d) 3
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- If $(1 - p)$ is a zero of the polynomial $x^2 + px + 1 - p = 0$, then find both zeroes of the polynomial.

(a) $0, -1$	(b) $1, -1$	(c) $1, 0$	(d) $0, 0$
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- In an isosceles right angled triangle, what is the length of the equal sides of the triangle, if its hypotenuse is $6\sqrt{2}$ cm?

(a) $3\sqrt{2}$ cm	(b) 6 cm
(c) 12 cm	(d) 5 cm



- 10.** Evaluate the area of the largest circle that can be inscribed inside a rectangle of sides 7 cm and 3.5 cm.
 (a) $\frac{12}{7}$ cm² (b) $\frac{17}{7}$ cm²
 (c) $\frac{77}{8}$ cm² (d) $\frac{22}{7}$ cm²
- 11.** Find the value of p if the distance between the points $(4, p)$ and $(1, 0)$ is 5.
 (a) ± 4 (b) ± 6 (c) ± 8 (d) ± 7
- 12.** What is the value of k if the point $(-3, k)$ divides the line segment joining the points $(-5, -4)$ and $(-2, 3)$ in a certain ratio?
 (a) -1 (b) 3 (c) 2 (d) $\frac{2}{3}$
- 13.** For any two numbers a and b , if 3 is the least prime factor of a and 7 is the least prime factor of b , then find the least prime factor of $(a + b)$.
 (a) 0 (b) 1 (c) 2 (d) 3
- 14.** In $\triangle ABC$, AD is the bisector of $\angle A$. Evaluate AC, if $BD = 4$ cm, $DC = 3$ cm and $AB = 6$ cm.
 (a) 4.5 cm (b) 6 cm
 (c) 3 cm (d) 7 cm
- 15.** What is the area of a quadrant of a circle whose circumference is 44 cm?
 (a) $\frac{77}{2}$ cm² (b) 77 cm²
 (c) $\frac{44}{7}$ cm² (d) 44 cm²
- 16.** The HCF of 85 and 153 can be expressed in the form of $85m - 153$. Calculate the value of m .
 (a) 1 (b) 5 (c) -1 (d) 2
- 17.** The total number of factors of a prime number is:
 (a) 0 (b) 1 (c) 2 (d) 3
- 18.** Evaluate the distance between the points $(a \sin \alpha, -b \cos \alpha)$ and $(-a \cos \alpha, b \sin \alpha)$.
 (a) 1
 (b) $\sqrt{a^2 + b^2}$
 (c) $2\sqrt{a^2 + b^2}$
 (d) $\sqrt{a^2 + b^2} (\sin \alpha + \cos \alpha)$
- 19.** For the given polynomial $p(x) = x^2 - 5x - 1$, if α and β are its zeroes, then find the value of $\alpha^2\beta + \alpha\beta^2$.
 (a) -5 (b) 4 (c) 0 (d) -7
- 20.** The centroid of a $\triangle ABC$ with vertices $A(-4, 6)$, $B(2, -2)$ and $C(2, 5)$ is:
 (a) $(3, 0)$ (b) $\left(\frac{8}{3}, 3\right)$
 (c) $\left(3, \frac{8}{3}\right)$ (d) $(0, 3)$

SECTION - B

16 marks

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

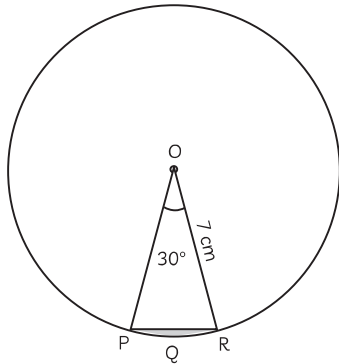
- 21.** Find the value of $\frac{3 - 4 \sin^2 A}{4 \cos^2 A - 3}$ if $\sec A = \frac{17}{8}$.
 (a) $\frac{33}{611}$ (b) $\frac{53}{78}$
 (c) $\frac{2}{\sqrt{3}}$ (d) $\frac{17}{64}$
- 22.** A, B and C start running in a circular track at the same time in the same direction. A completes a round in 252 s, B in 308 s and C in 198 s. After what time will they meet again at the starting point?
 (a) 46 min 12 sec (b) 42 min 6 sec
 (c) 52 min 12 sec (d) 56 min 10 sec
- 23.** On choosing a number randomly from the numbers: $-2, -1, 0, 1, 2$, the probability that $x^2 < 2$ is:
 (a) $\frac{4}{5}$ (b) $\frac{1}{5}$
 (c) $\frac{3}{5}$ (d) $\frac{2}{5}$
- 24.** The diagonals of a rhombus are of length 10 cm and 24 cm, then the length of its each side is:
 (a) 9 cm (b) 13 cm
 (c) 15 cm (d) 17 cm
- 25.** In $\triangle ABC$, $DE \parallel BC$. If $AD = 2x - 1$, $AE = 2x + 5$, $BD = x - 3$ and $CE = x - 1$, then the value of x is:
 (a) 8 (b) 9 (c) 10 (d) 11
- 26.** What is the ratio of the areas of a circle and an equilateral triangle whose diameter and a side, respectively are equal?
 (a) $\sqrt{2} : \pi$ (b) $\sqrt{3} : \pi$
 (c) $\pi : \sqrt{3}$ (d) $\pi : \sqrt{2}$
- 27.** A line intersects y -axis and x -axis at the points P and Q respectively. Find the coordinates of P, if $(2, -5)$ is the mid-point of PQ.
 (a) $(0, -10)$ (b) $(4, 0)$
 (c) $(10, 0)$ (d) $(0, -4)$

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28. What is the area of the segment PQR, in the given figure, if the radius of the circle is 7 cm?
(use $\pi = \frac{22}{7}$)



- (a) $\frac{12}{7}$ cm² (b) $\frac{11}{5}$ cm²
(c) $\frac{22}{7}$ cm² (d) $\frac{7}{12}$ cm²

29. A card is drawn from a box, which have cards marked with numbers 2 to 101, mixed thoroughly. One card is drawn from the box. What is the probability that the card taken out bears a number which is a perfect cube?

- (a) $\frac{1}{20}$ (b) $\frac{7}{100}$
(c) $\frac{9}{100}$ (d) $\frac{3}{100}$

30. Consider two numbers, whose HCF and LCM are 33 and 264 respectively. The first number is completely divisible by 2 and gives quotient 33. What is the other number?
(a) 66 (b) 132 (c) 58 (d) 73

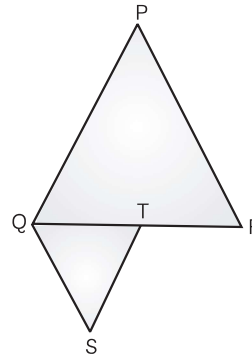
31. Quadratic polynomial i.e., a parabolic curve is used to model the shape of many architectural structures around the world. The tallest memorial, Gate Arch of USA is one type of such structures. The graph of a quadratic polynomial is a U-shaped curve with a maximum or minimum point called vertex. It is either open upward or downward.



What are the zeroes of the polynomial $6x^2 - 7x - 3$, if it represent the arch?

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

32. ΔPQR and ΔQST are two equilateral triangles such that T is the mid-point of QR. Find the ratio of areas of ΔPQR and ΔQST .



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

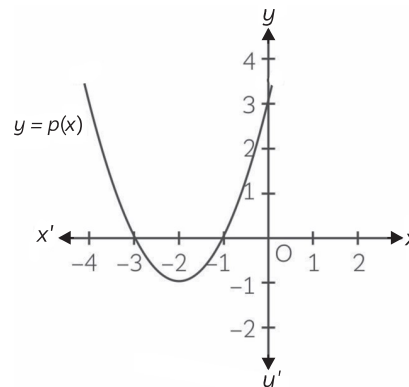
33. Evaluate the coordinates of the point which divides the line segment joining the points (8, -9) and (2, 3) internally in the ratio 1 : 2.
(a) (6, -5) (b) (5, 5) (c) (1, -4) (d) (2, 3)

34. Evaluate λ , if three points (0, 0), (3, $\sqrt{3}$) and (3, λ) form an equilateral triangle.
(a) -4 (b) 2 (c) -3 (d) $\pm\sqrt{3}$

35. From a well-shuffled deck of 52 playing cards, three cards ace, jack and queen of hearts are removed. One card is selected from the remaining cards. What is the probability of getting a card of hearts?

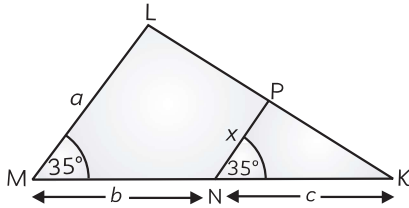
- (a) $\frac{10}{49}$ (b) $\frac{5}{49}$
(c) $\frac{8}{49}$ (d) $\frac{13}{49}$

36. The graph of a polynomial $p(x)$ is given in the figure. What are the zeroes of the polynomial $p(x)$?



- (a) 3 and 0 (b) -3 and -1
(c) -3 and 0 (d) -1 and 0

37. Evaluate the value of x in terms of a , b and c .
(See the given figure)

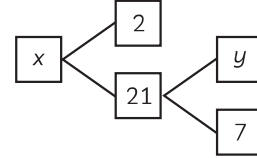


- (a) $\frac{ac}{b+c}$ (b) $\frac{ab+ac}{b^2}$
(c) $\left(\frac{1}{a} + \frac{1}{b}\right)^c$ (d) $\frac{a+b}{c}$

38. What is the value of a , if 2 is a zero of the polynomial $p(x) = 4x^2 + 2x - 5a$?
(a) 4 (b) 6 (c) -1 (d) 0

39. What is the ratio in which the line $3x + y - 9 = 0$ divides the segment joining the points $A(1, 3)$ and $B(2, 7)$?
(a) 4 : 3 (b) 3 : 4 (c) 4 : 7 (d) 7 : 4

40. Calculate $\frac{x}{y}$



- (a) 14 (b) 3
(c) 15 (d) 18

SECTION - C

8 marks

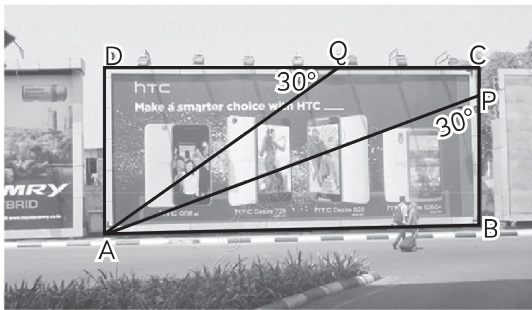
(Case Study Based Questions.)

(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:

Neeraj who belongs to a small town in Maharashtra was coming to a big city for the first time. As he was driving past the Mumbai airport road along with his family, he observed a big billboard of length 6 m and width 3 m. Further, $\angle DQA = 30^\circ$ and $\angle APB = 30^\circ$.



41. The length AP is :
(a) 6 m (b) $6\sqrt{3}$ m
(c) 12 m (d) $12\sqrt{3}$ m
42. The length BP is:
(a) 6 m (b) 12 m
(c) $6\sqrt{3}$ m (d) $12\sqrt{3}$ m
43. Ratio of $\sin \angle APB : \sin \angle AQP$ is:
(a) 1 : 2 (b) $1 : \sqrt{3}$
(c) $\sqrt{3} : 1$ (d) 1 : 1

44. The value of $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$ is:

- (a) 1 (b) 0 (c) -1 (d) $\frac{1}{4}$

45. The length of $(AP + AQ)$ is:

- (a) $6(\sqrt{3} + 1)$ m (b) 18 m
(c) 36 m (d) $12(\sqrt{3} + 1)$ m

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

Case Study-2:

Rajesh want to choose a best plan for his mobile phone. He has 2 options available with him. The first plan of company A, cost ₹ 20 per month, with costing an additional 25 paise per minute. The second plan of company B charges ₹ 40 per month, but calls cost 8 paise per minute. These two situations are shown below in the form of linear equations.

$$y = 0.25x + 20$$

and

$$y = 0.08x + 40$$

Where, x is the minutes used any is the total cost per month.



Cost : Plans prices range from under 10 to over 100



Types of Plan : Prepaid and post-paid or phone on a plane



Network : Coverage



Other benefits : Calls, SMS, Data and other extras

