

# TERM-1

## SAMPLE PAPER

### CODE-AG-TMC-TERM-1- 00B

# 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.)

- Find the largest number which divide the numbers 615 and 963 leaving remainder 6 in each case.  
(a) 87 (b) 75  
(c) 56 (d) 88
- How many solutions does the pair of equations  $x + y = 1$  and  $x + y = -5$  have?  
(a) Unique (b) No solution  
(c) Infinitely many (d) Can't decide
- Find the value of  $p$  for which the following pair of linear equations have infinitely many solutions?  
 $(p - 3)x + 3y = p, px + py = 12$   
(a) -6 (b) 0  
(c) 6 (d) 12
- In  $\triangle ABC$ , D is point on side AB and E is a point on side AC such that  $\angle ADE = \angle ABC$ ,  $AD = 2$ ,  $BD = 3$  and  $AE = 3$ , then what is the value of CE?  
(a) 6 cm (b) 3 cm  
(c) 4.5 cm (d) 5 cm
- For what value(s) of  $x$ , the distance between the points P(2, -3) and Q(x, 5) is 10?  
(a) 9, 2 (b) -4, 8  
(c) 10, 1 (d) 6, 3
- Find the diameter of a semi-circular protactor, whose perimeter is 36 cm.  
(a) 7 cm (b) 14 cm  
(c) 21 cm (d) 42 cm
- Evaluate the zeroes of the polynomial  $2x^2 - 16$ .  
(a)  $2\sqrt{2}, -2\sqrt{2}$  (b)  $\sqrt{2}, -\sqrt{2}$   
(c) 4, -4 (d) 2, -2
- What is the value of  $k$  in the expression,  $\sec^2 \theta (1 + \sin \theta)(1 - \sin \theta) = k$ ?  
(a)  $\frac{1}{5}$  (b) 7  
(c) 1 (d) 12
- If point P(4, 2) lies on the line segment joining the points A(2, 1) and B(8, 4) then:  
(a)  $AP = PB$  (b)  $PB = \frac{1}{3}AP$   
(c)  $AP = \frac{1}{2}PB$  (d)  $AP = \frac{1}{3}PB$
- What is the perimeter of a triangle having vertices (0, 4), (0, 0) and (3, 0)?  
(a) 10 units (b) 15 units  
(c) 12 units (d) 9 units
- Evaluate the area of a quadrant of a circle, provided that its circumference is 20 cm.



- (a)  $127.3 \text{ cm}^2$       (b)  $130.2 \text{ cm}^2$   
 (c)  $135.6 \text{ cm}^2$       (d)  $143.7 \text{ cm}^2$

12. What is the probability of getting 101 marks out of 100 marks in maths exams?

- (a) 1                      (b) 0  
 (c) 0.5                  (d) 0.01

13. What is the value of  $x$  in the following equation:

$$\sin 2x = \sin 45^\circ \cos 45^\circ + \sin 30^\circ$$

- (a)  $30^\circ$                   (b)  $45^\circ$   
 (c)  $60^\circ$                   (d)  $75^\circ$

14. What is the value of  $a$  if the mid-point of the line segment joining the points  $P(6, a-2)$  and  $Q(-2, 4)$  is  $(2, -4)$ ?

- (a) -10                    (b) 10  
 (c) 0                        (d) 7

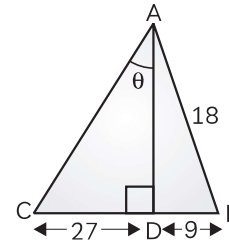
15. What is the probability of choosing a vowel from the word MATCH if a letter is chosen randomly from it?

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

16. Evaluate the simplified value of  $(1 + \cot^2 \theta)(1 - \cos \theta)(1 + \cos \theta)$ .

- (a) 1                        (b) -1  
 (c)  $\cot \theta$                 (d)  $\sec^2 \theta$

17. Find the value of  $\tan \theta$ , by using the following figure:



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

18. A ladder which is 17 m long, reaches the window of a building which is 15 m above the ground. What is the distance of the foot of the ladder from the building?

- (a) 8 m                      (b) 12 m  
 (c) 10 m                    (d) 13 m

19. If the points  $(5, 0)$ ,  $(0, -2)$  and  $(3, 6)$  lie on the graph of a polynomial, then, which of the following is a zero of the polynomial?

- (a) 5                        (b) 6  
 (c) -2                      (d) Data insufficient

20. Find the value of  $\angle BAD$  in  $\triangle ABC$ , if  $D$  is

a point on side  $BC$  such that  $\frac{AB}{AC} = \frac{BD}{DC}$ ,  $\angle B = 70^\circ$  and  $\angle C = 50^\circ$ .

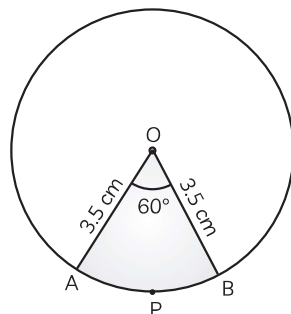
- (a)  $30^\circ$                     (b)  $45^\circ$   
 (c)  $60^\circ$                     (d)  $75^\circ$

## SECTION - B

16 marks

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

21. What is the length of  $OAPB$ , in the given figure? (Use  $\pi = 3.14$ )



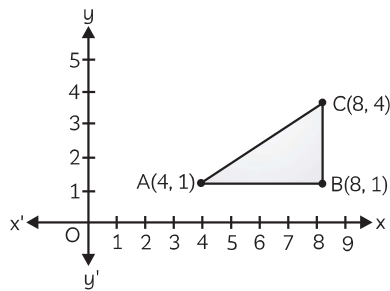
- (a) 22 cm                    (b) 11 cm  
 (c) 13 cm                    (d) 17 cm

22. G.D. Goenka School is a famous CBSE school having many branches in different cities of India. One of the branches of G.D. Goenka School is in Agra, U.P. In that school, thousand of students study.



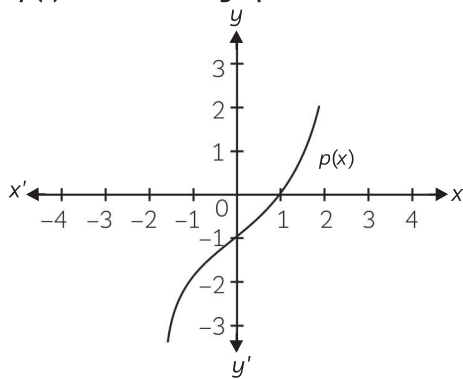
One boy of the school is standing on the ground at a point having coordinates  $(4, 1)$  facing towards east. He moves 4 units in the straight line then take left and moves 3 units and stop, then he reaches his home. Representation of the above situation on the coordinate axes is shown below.





What is the shortest distance between his school and house?

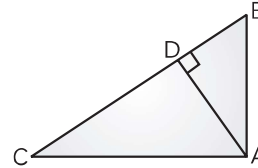
- (a) 7 units                      (b) 3 units  
(c) 5 units                      (d) 4 units
- 23.** Consider the two numbers whose sum is 135 and their HCF is 27. If their LCM is 162, then what will be the larger number?  
(a) 81                              (b) 78  
(c) 57                              (d) 54
- 24.** Three coins are tossed simultaneously. The probability of getting at most one tail is:  
(a)  $\frac{1}{2}$                               (b)  $\frac{2}{3}$   
(c)  $\frac{3}{4}$                               (d)  $\frac{3}{8}$
- 25.** Find the number of zeroes, for the polynomial  $p(x)$  shown in the graph below:



- (a) 0                              (b) 1  
(c) 2                              (d) 3
- 26.** Polynomial  $f(x) = x^2 - 5x + k$  has zeroes  $\alpha$  and  $\beta$  such that  $\alpha - \beta = 1$ . Find the value of  $4k$ .  
(a) 6                              (b) 12  
(c) 18                              (d) 24
- 27.** What is the measure of the hypotenuse of a right triangle, when its medians, drawn from the vertices of the acute angles, are 5 cm and  $2\sqrt{10}$  cm long?  
(a)  $5\sqrt{8}$  cm                      (b)  $2\sqrt{13}$  cm  
(c)  $6\sqrt{10}$  cm                      (d)  $2\sqrt{7}$  cm

- 28.** Find the value of  $\sin 2\theta_1 + \tan 3\theta_2$ , if  $\tan(\theta_1 + \theta_2) = \sqrt{3}$  and  $\sec(\theta_1 - \theta_2) = \frac{2}{\sqrt{3}}$ .  
(a) 2                              (b) 1  
(c) 0                              (d) -1

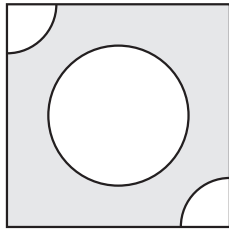
- 29.** Evaluate the value of  $AB^2 + CD^2$  in the given figure, if  $AD \perp BC$  and  $BD = 2, AC = 4$ .



- (a) 16                              (b) 20  
(c) 4                              (d) 6
- 30.** What is the probability of getting black face card, if face cards of spades are removed from a well-shuffled pack of 52 cards?  
(a)  $\frac{1}{49}$                               (b)  $\frac{2}{49}$   
(c)  $\frac{3}{49}$                               (d)  $\frac{4}{49}$
- 31.** What are the coordinates of the point C, such that  $B\left(\frac{1}{2}, 6\right)$  divides the line segment joining the points  $A(3, 5)$  and C in the ratio of 1 : 3?  
(a) (0, 0)                              (b) (7, 9)  
(c) (7, -9)                              (d) (-7, 9)
- 32.** Find  $x^2 + y^2$ , where  $x$  and  $y$  are related as:  $x \sin^3 \theta + y \cos^3 \theta = \sin \theta \cos \theta$  and  $x \sin \theta = y \cos \theta$ .  
(a) 1                              (b)  $\frac{3}{2}$   
(c)  $\frac{1}{2}$                               (d) 0
- 33.** If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes  $\frac{1}{2}$ , if we add 1 to the denominator only. Then the required fraction is:  
(a)  $\frac{2}{9}$                               (b)  $\frac{3}{5}$   
(c)  $\frac{4}{7}$                               (d)  $\frac{5}{13}$
- 34.** In an equilateral triangle PQR, PT is an altitude. Then the value of  $4PT^2$  is:  
(a)  $3PQ^2$                               (b)  $(PQ + QR)^2$   
(c)  $PQ^2$                               (d)  $2PQ^2$
- 35.** Evaluate  $\left(\frac{-101}{\cos^2 A} + \frac{101}{\cot^2 A}\right)$ .  
(a) 101                              (b) -101  
(c) 1                              (d) -1



- 36.** From a square of side 8 cm, two quadrants of a circle of radii 1.4 cm are cut from two corners. Another circle of radius 4.2 cm is also cut from the centre as shown in the figure. Find the area of the remaining (shaded) portion of the square. [Take  $\pi = \frac{22}{7}$ ]

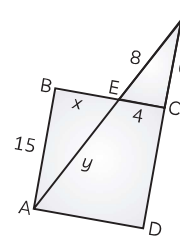


- (a)  $6.12 \text{ cm}^2$                       (b)  $5.48 \text{ cm}^2$   
(c)  $5.76 \text{ cm}^2$                       (d)  $6.45 \text{ cm}^2$

- 37.** What is the relation between  $x$  and  $y$ , if the point  $P(x, y)$  is equidistant from the points  $A(7, 0)$  and  $B(0, 5)$ ?

- (a)  $x + 2y = 9$                       (b)  $7x - 5y = 12$   
(c)  $5x + 2y = 15$                       (d)  $3x - 2y = 7$

- 38.** In the given figure, ABCD is a parallelogram in which DC is extended to F such that AF intersects BC at E. Then perimeter of  $\triangle ABE =$



- (a) 35 cm                                  (b) 36 cm  
(c) 40 cm                                  (d) 45 cm

- 39.** What is the ratio in which point  $P(1, 2)$  divides the join of  $A(-2, 1)$  and  $B(7, 4)$ ?

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

- 40.** Find the value of  $k$ , if  $x - 2y + k = 0$  is a median of the triangle ABC whose vertices are  $A(-1, 3)$ ,  $B(0, 4)$  and  $C(-5, 2)$ .

- (a) 8    (b) 6  
(c) 4    (d) 2

## SECTION - C

### (Case Study Based Questions.)

**8 marks**

*(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:**

Three friends Ramesh, Suresh and Rajesh step off together. Their steps measuring 240 cm, 90 cm, 120 cm respectively. They went to Rajiv juice shop for getting juice, which is situated nearby.



- 41.** What is the minimum distance of the shop from the point where they start to walk together, so that one can cover the distance in complete steps?

- (a) 740 cm                                  (b) 640 cm  
(c) 700 cm                                  (d) 720 cm

- 42.** What is the number of common steps cover by all of them to reach the juice shop?

- (a) 40    (b) 45  
(c) 30    (d) 20

- 43.** If  $a$  and  $b$  are two numbers, then find the correct relation between their LCM and HCF.

- (a)  $a \times \text{LCM}(a, b) = b \times \text{HCF}(a, b)$   
(b)  $\frac{a}{b} = \text{LCM}(a, b) \times \text{HCF}(a, b)$   
(c)  $a \times b = \text{LCM}(a, b) \times \text{HCF}(a, b)$   
(d)  $b \times \text{LCM}(a, b) = a \times \text{HCF}(a, b)$

- 44.** What name is given to a largest positive integer that divides given two positive integers completely?

- (a) Coprime                                  (b) HCF  
(c) LCM    (d) Twin Prime

- 45.** Factor tree is a chain of factors, which is represented in the form of a:

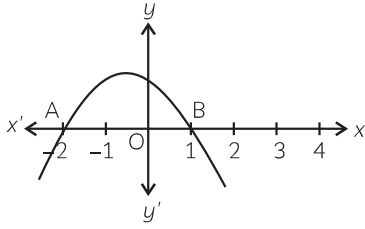
- (a) flower                                      (b) division  
(c) tree    (d) leaf

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

**Case Study-2:**

*Last month, heavy storm came in Kerala. Due to this storm, thousands of trees got broke and electric poles bent out. Some of the electric poles bent*

into the shape of parabola. One of the images of bent electric pole is shown in the figure below:



46. Calculate the zeroes of the given curve.

- (a) -2 and 1                      (b) -2 and -1  
(c) 2 and -1                      (d) 2 and 1

47. What is the polynomial expression of the given curve?

- (a)  $x^2 + x - 2$                       (b)  $x^2 - x + 2$   
(c)  $x^2 - x - 2$                       (d)  $x^2 + x + 2$

48. If  $x = 2$ , then what will be the value of the polynomial?

- (a) 3                                      (b) -4  
(c) 2                                      (d) 4

49. If the parabola is moved towards the right side by one unit, then find the new polynomial expression.

- (c)  $x^2 - 3x + 2$                       (d)  $x^2 + x + 2$   
(a)  $x^2 + x - 2$                       (b)  $x^2 - x - 2$

50. Suppose the quadratic polynomial for given curve is  $ax^2 + bx + c$ . Then a is always:

- (a)  $> 0$                                       (b)  $< 0$   
(c)  $\geq 0$                                       (d)  $\leq 0$

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