विद्या सर्वार्थि साधिका

ANANDALAYA

PERIODIC TEST – 2

Class: X

Subject: Mathematics (041) M.M : 80

Date : 16-09-2025 Time : 3 Hours

General Instructions:

1. This Question paper contains - five sections A, B, C, D and E. Each section is compulsory.
2. Section A has 18 MCQ's and 02 Assertion – Reason based questions of 1 mark each.
3. Section B has 5 Very Short Answer (VSA) – type questions of 2 marks each.
4. Section C has 6 Short Answer (SA) – type questions of 3 marks each.
5. Section D has 4 Long Answer (LA) – type questions of 5 marks each.
6. Section E has 3 source based/case based/passage based/integrated units of assessment of 4 marks each with sub-parts.
7. All Questions are compulsory. However, an internal choice in 2 questions of 5 marks, 2 questions of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION A

1. Which of the following are the zeros of the polynomial $f(x) = 4x^2 - 12x + 9$. (1)

   (A) $\frac{3}{2}, \frac{3}{2}$ (B) $-\frac{3}{2}, -\frac{3}{2}$ (C) $3, 4$ (D) $-3, -4$

2. What is the discriminant value of $x^2 + 5x + 5 = 0$? (1)

   (A) 5/2 (B) 5 (C) – 5 (D) – 4

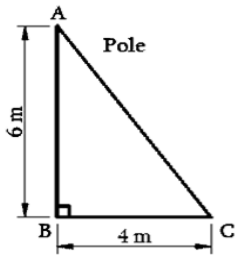
3. Find the 30th term of the AP: 10, 7, 4 ……. (1)

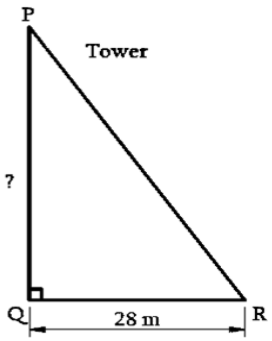
   (A) 97 (B) 77 (C) – 77 (D) – 87

4. If in two triangles, DEF and PQR, ∠D=∠Q and ∠R=∠E, then which of the following is not true? (1)

   (A) $\frac{EF}{PR} = \frac{DF}{QP}$ (B) $\frac{EF}{RP} = \frac{DE}{PQ}$ (C) $\frac{DE}{QR} = \frac{DF}{PQ}$ (D) $\frac{EF}{RP} = \frac{DE}{QR}$

5. A vertical pole of length 6m casts a shadow 4m long on the ground and at the same time a tower cast a shadow 28 m long. Find the height of the tower. (1)





   (A) 10 m (B) 28 m (C) 36 m (D) 42 m

6. $x = a \; and \; y = b$ is the solution of the linear equation $x - y = 2 \; and \; x + y = 4$, then find the value of a and b. (1)

   (A) $2, 1$ (B) 3, 1 (C) 4, 6 (D) $1, 2$

7. The value of $(HCF \times LCM)$ for the numbers 50 and 20 is_____? (1)

   (A) 1000 (B) 50 (C) 100 (D) 500

8. In the Δ ABC, D and E are points on side AB and AC respectively such that DE || BC. (1)
If AE = 2cm, AD = 3 cm and BD = 4.5 cm, then find CE.
(A) 1 cm (B) 2 cm (C) 3 cm (D) 4 cm

9. If $x = 2\sin^2\theta$ and $y = 2cos^2\theta + 1$ then the value of $x + y$?: (1)
(A) 3 (B) 2 (C) 1 (D) ½

10. A triangle with vertices (4, 0), (–1, – 1) and (3, 5) is form a/an _____ triangle. (1)
(A) equilateral (B) right-angled (C) isosceles right (D) only isosceles

11. For what value of k, the pair of linear equations $2x - y - 3 = 0\ and\ kx = \frac{7}{2}y$ has a unique solution. (1)
(A) k ≠ 7 (B) k = 1 (C) k = 7 (D) k ≠1

12. If $cos\ \theta + \cos^2\ \theta = 1$, What is the value of $\sin^2\ \theta + \sin^4\theta$? (1)
(A) – 1 (B) 1 (C) 0 (D) 2

13. If $\alpha + \beta = 4$ and $\alpha^3 + \beta^3 = 44$, then α, β are the roots of which one of the following equations. (1)
(A) $2x^2 - 8x - 7 = 0$ (B) $2x^2 + 8x + 12 = 0$
(C) $3x^2 - 12x + 7 = 0$ (D) $3x^2 - 12x + 5 = 0$

14. If 8, b ,16 are in AP, then find the value of b. (1)
(A) 10 (B) 12 (C) – 12 (D) 24

15. If $(x + 1)$ is a factor of $2x^3 + ax^2 + 2bx + 1$, then find the values of $a\ and\ b$ given that; (1)
$2a - 3b = 4$.
(A) $a = -1,\ b = -2$ (B) $a = 2,\ b = 5$
(C) $a = 5, b = 2$ (D) $a = 2,\ b = 0$

16. The pair of linear equations $2x - 3y = 1$ and $3x - 2y = 4$ has _____. (1)
(A) One solution (B) Two solutions (C) No solution (D) Infinitely many solution

17. If $(c + 1)$ is the HCF of 92 and 152 then find the value of $(c - 1)$. (1)
(A) 4 (B) 3 (C) 2 (D) 5

18. In what ratio the origin divides the line segment AB joining the points A (1, –3) and B (–3, 9). (1)
(A) 3 : 1 (B) 1 : 3 (C) 2 : 3 (D) 1 : 1

In the following questions 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true but R is not the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.

19. (A): $sin^2 75° + cos^2 75° = 1$. (1)
(R): For any value of θ, $sin^2\theta + cos^2\theta = 0$.

20. (A): If the sum of the first n terms of an AP is $S_n = 3n^2 + 2n$, then its first term is 5. (1)
(R): The nth term of an AP is given by $a_n = S_n - S_{n-1}$.

SECTION - B

21. For what value of p, (-4) is a zero of the polynomial $x^2 - 2x - (7p + 3)$? (2)

OR

Find the quadratic polynomial whose zeros are $-9\ and\ -\frac{1}{9}$.

22. If the distance between the points (8, r) and (4, 3) is 5 units then find the value(s) of r. (2)

23. Find is the HCF of 8262 and 101592. (2)

24. If $3\tan\theta = 4$, find the value of $\frac{(5\sin\theta - 3\cos\theta)}{(5\sin\theta + 2\cos\theta)}$. (2)

OR

Evaluate: $3\cot^2 60° + \sec^2 45°$.

25. Using identity, prove that $\frac{\tan\theta - \cot\theta}{\sin\theta \cdot \cos\theta} = \tan^2\theta - \cot^2\theta$. (2)

SECTION -C

26. What is the inegral solution of x for the equation $2^{2x^2-7x+7} = 4$. (3)

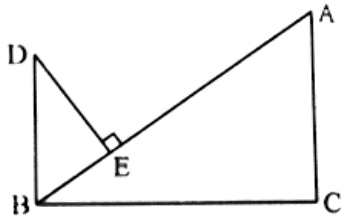
27. 2 tables and 3 chairs together cost ₹ 2000 whereas 3 tables and 2 chairs together cost ₹ 2500. Find the total cost of a table and a chair. (3)

OR

Solve the given linear equation graphically: $2x - 3y = 7\ and\ x + y = 1$.

28. There are 576 boys and 448 girls in a school that are to be divided into equal sections of either boys or girls alone. Find the total number of secitions thus formed. (3)

29. In the given figure, DB ⊥ BC, DE ⊥ AB and AC ⊥ BC. Prove that $\frac{BE}{DE} = \frac{AC}{BC}$. (3)



30. Find the ratio in whch the line segment joinng (2, – 3) and (5, 6) is divided by x-axis, also find the coordinates of the point. (3)

OR

Show that the points A (1, 2), B (5, 4), C (3, 8) and D (–1, 6) are the vertices of a square.

31. In ΔRPQ is a right angled at Q. If PQ = 5 cm and RQ = 10 cm, find (i) $sin\ P\ \times\ cos\ P$ (ii) $tan\ R$. (3)

SECTION –D

32. Find the quadratic polinomial, sum and product of whose zeros are $-1\ and\ -20$ respectively. Also, find the zeros of the polynomial so obtained. (5)

OR

If $\alpha,\ \beta$ are zeros/roots of polynomial $x^2 - 6x + k$, find the value of k such that $\alpha^2 + \beta^2 = 40$.

33. State and prove the Thales theorem. (5)

34. The first term of an AP is 5, the last term is 45 and the sum of all its term is 400. Find the number of terms and the common difference of the AP. (5)

35. If the equation $(1 + m^2)x^2 + 2mcx + c^2 - a^2 = 0$ has equal roots then show that , $c^2 = a^2(1 + m^2)$. (5)

OR

The sum of the reciprocals of Shanaya's ages (in years) 3 years ago and 5 years from now is 1/3. Find her present age.

SECTION – E

36. In some specific type of assessment, the test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while ¼ mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

Type of Question	Marks given for correct answer	Marks deducted for wrong answer
True/False	1	0.25

(i) If answer to all questions he attempted by guessing were wrong, then how many questions did he answer correctly? (1)

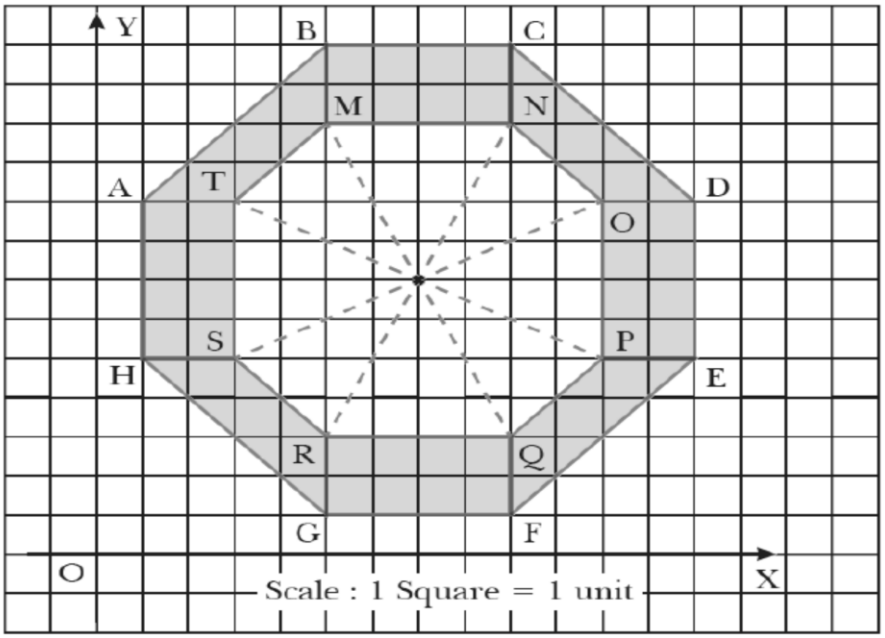
(ii) How many questions did he guess? (1)

(iii) If answer to all questions he attempted by guessing were wrong and answered 80 correctly, then how many marks he got? (2)

OR

(iii) If answer to all questions he attempted by guessing were wrong, then how many questions were answered correctly to score 95 marks?

37. The table and top of a table is shown in the figure:



On the basis of above information answer the following questions.

(i) Find the distance between points A and B. (1)

(ii) Write the co-ordinates of the midpoint of line segment joining points M and Q. (1)

(iii) If G is taken as the origin, and x, y axis put along GF and GB, then find the point denoted by coordinates (4, 2) and (8, 4). (2)

OR

(iii) Find the coordinates of H, G and also find the distance between them.

38. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6^{th} year and 22600 in 9^{th} year.

Based on the above information, answer the following questions:

(i) Find the production during 1^{st} year. (1)

(ii) Find the production during 8^{th} year. (1)

(iii) In which year the production was 29200? (2)

OR

(iii) Find the difference of the production during 7^{th} year and 4^{th} year.