MATHEMATICS - Paper - II   16E(A)

(English Version)

Time : $2\frac{1}{2}$ Hours	Parts A and B	Maximum Marks : 50

Time : 2 Hours	Part- A	Marks : 35

SECTION - I   (Marks 5 × 2 = 10)

I. 1. Answer **Any FIVE** (5) questions, choosing **atleast TWO** (2) from each of the following two groups, **A & B.**
    2. Each question carries 2 marks.

Group-A

1. A tangent to a circle is perpendicular to the radius through the point of contact. Prove.

2. If A = (4, 2) ; B = (1, y) and AB = 5, find the possible values of y.

3. Find the area of the triangle whose vertices are (9, −9), (8, −2) and (1, −3).

4. The mean of marks secured by 50 students is 80. On verification of data, it was found that the marks of one student were shown as 73 instead of 37. Find the correct mean.

Group-B

5. If $\cos \theta = \frac{\sqrt{3}}{2}$, then find the value of $4 \sin^2 \theta + \tan\theta$.

6. If A = $\begin{bmatrix} 2 & 4 \\ -6 & 5 \end{bmatrix}$, B = $\begin{bmatrix} 4 & -3 \\ 5 & 7 \end{bmatrix}$, find the value of 2A + 5B.

7. What are the types of operations a Computer can perform?

8. State the language that are usd in Computers.

SECTION - II   (Marks 4 × 1 = 4)

1. Answer **ANY FOUR** of the following **SIX** questions.   2. Each question carries 1 mark.

9. State "Alternate segment theorem."

10. Find the slope of the line which is parallel to the line 3x − 2y + 1 = 0.

11. Find the value of cos0° + sin90° + $\sqrt{2}$ sin 45°.

12. Find the mode when median is 125.6 and mean is 128.

13. Define the Algorithm.

14. If $\begin{vmatrix} 2 & -4 \\ 5 & d-2 \end{vmatrix} = 4$, then find the value of d.

SECTION - III   (Marks 4 × 4 = 16)

1. Answer **ANY FOUR** questions, choosing **atleast TWO** from each group. 2. Each question carries 4 marks.

Group-A

15. State and prove Pythagoras theorem.

16. Find the equation of the line which passes through the point (1, -6) and whose prodect of the intercepts on the co-ordinate axes is 1.

17. Show that the points A(1, 2), B(−3, 4) and C(7, −1) are collinear and find the ratio in which 'A' divides BC.

18. Find the mean of the following frequency distribution.

Class -Interval	25-31	31-37	37-43	43-49	49-55	55-61
Frequency	20	12	16	10	4	3

Group B

19. If sec A + tan A = x, then show that $\dfrac{x^2-1}{x^2+1} = \sin A$.

20. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then show that $A^2 - (a+d)A = (bc-ad) I$.

21. Solve the following by using Matrix Inverse method : $a_1x + b_1y + c_1 = 0$; $a_2x + b_2 Y + C_2 = 0$

22. Write an Algorithm and draw a Flow Chart to pick the largest of the three given numbers.

SECTION - IV   (Marks 1 × 5 = 5)

1. Answer ANY ONE of the following questions.   2. The Question carries. 5 marks.

23. Construct a triangle ABC, in which BC = 5 cm., ∠A = 70° and median AD through A is 3.5 cm.

24. The upper part of a tree, broken by wind in two parts, makes an angle of 30° with the ground. The top of the tree touches the ground at a distance of 20 metres from the foot of the tree. Find the height of the tree before it was broken.

Mathematics - Paper - II
English Version

Time : 30 Minutes	Part - B	Marks : 15

Note :   1.   Answer all the Questions. Each question carries $\frac{1}{2}$ mark.   2. Answers are to be written in the question paper only.   3. Marks will not be given for over written, rewriting or erased answers.

I. *Write the 'CAPITAL LETTER' showing the correct answer for the following Questions in the brackets provided against them.*

1. The Mode of a classified data is _____   (   )

A) $L + \dfrac{(f-f_1)}{2f-(f_1+f_2)} \times C$

B) $L + \dfrac{(f-f_1)C}{2f-(f_1-f_2)}$

C) $L + \dfrac{\Delta_1}{(\Delta_1 + \Delta_2)C}$

D) $L + \dfrac{\Delta_2}{(\Delta_1 + \Delta_2)c}$

2. If θ is eiminated from x = sec θ + tan θ, y = sec θ tan θ, then the relation is(   )

A) $xy = 1$ B) $x + y = 1$ C) $x^2 - y^2 = 1$ D) $x - y = 1$

3. $120° = $ _____ radians.   (   )

A) $\dfrac{3\pi}{2}$ B) $\dfrac{2\pi}{3}$ C) $\dfrac{3\pi}{4}$ D) $\dfrac{\pi}{4}$

4. The slope of the line perpendicular to 5x – 2y + 3 = 0 is _____   (   )

A) $\dfrac{5}{2}$ B) $\dfrac{2}{5}$ C) $-\dfrac{5}{2}$ D) $-\dfrac{2}{5}$

5. Large scale integrated circuits are used in ___ generation computers.   (   )

A) Second B) First C) Fourth D) Third

6. If sec θ + tan θ = m, then the value of secθ – tan θ will be _____   (   )

A) $\dfrac{1}{m}$ B) $\dfrac{m}{2}$ C) $- m$ D) $m + 1$

7. The following are present in Histogram _____ ( )

    A) Rectangles   B) Triangles   C) Rhombus   D) Sectors

8. If $A = \begin{bmatrix} 3 & 0 \\ 0 & \lambda \end{bmatrix}$ is a scalar matrix, then the value of λ is _____ . ( )

    A) $\frac{1}{3}$ B) 1   C) 3   D) 0

9. The mathematician who introduced Analytical Geometry is _____ ( )

    A) Newton   B) J.J.Silvester   C) Crammer   D) Rene Decartes

10. If $\begin{bmatrix} x & 5 \\ 5 & x \end{bmatrix}$ does not have multiplicative inverse, then x = ( )

    A) 6   B) 5   C) 10   D) 25

II. *Fill in the blanks with suitable answers.*

11. The distance between origin and the point (x, y) is _____

12. If two circles are touching internally, then the number of common tangents drawn are _____

13. $\sin 420° = $ _____

14. State Basic Proportionality theorem _____

15. $\begin{bmatrix} \sec\theta & \tan\theta \\ \tan\theta & \sec\theta \end{bmatrix} = $ _____

16. The intercept form of a line is _____ .

17. The A.M. of 3, 5, 9, x, 11 is 7; then the value of x = _____

18. In a Computer, the information will be stored in _____ .

19. Formula used to find median of a Grouped data is _____ .

20. The point of concurrency of altitudes of a triangle is called _____ .

III. *Find the correct answer for the questions given under Group A selecting them from Group B and write the indicating letter in the given brackets.*

      i) Group A   ***Group B***

21. The point equidistant from vertices of a triangle is ( )   (A) Acute angle

22. 60° angle is called _____ ( )   (B) 18

23. The range of First 15 natural numbers is _____ ( )   (C) Slope-intercept

24. The mode of 21, 16, 21, 18, 14, 21, 18 is _____ ( )   (D) Circumcentre

25. y = mx + c is called _____ form. ( )   (E) 14

                                (F) 21

                                (G) Centroid

                                (H) Intercept

      (ii) Group A   ***Group B***

26. Angle in a semi-circle _____ ( )   (I) 3×2

27. If $\sin A = \cos A = \frac{1}{\sqrt{2}}$, then $\angle A = $ ( )   (J) Hardware

                                (K) 90°

28. If $A \times \begin{bmatrix} 1 & 1 \\ 0 & 2 \end{bmatrix} = (1 \ 2)$, then order of is _____ ( )   (L) Transistors

                                (M) 1×2

29. The three organs in a Computer together constitute _____ ( )   (N) 45°

30. Second Generation Computer consists of _____ ( )   (O) Vacuum tubes

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