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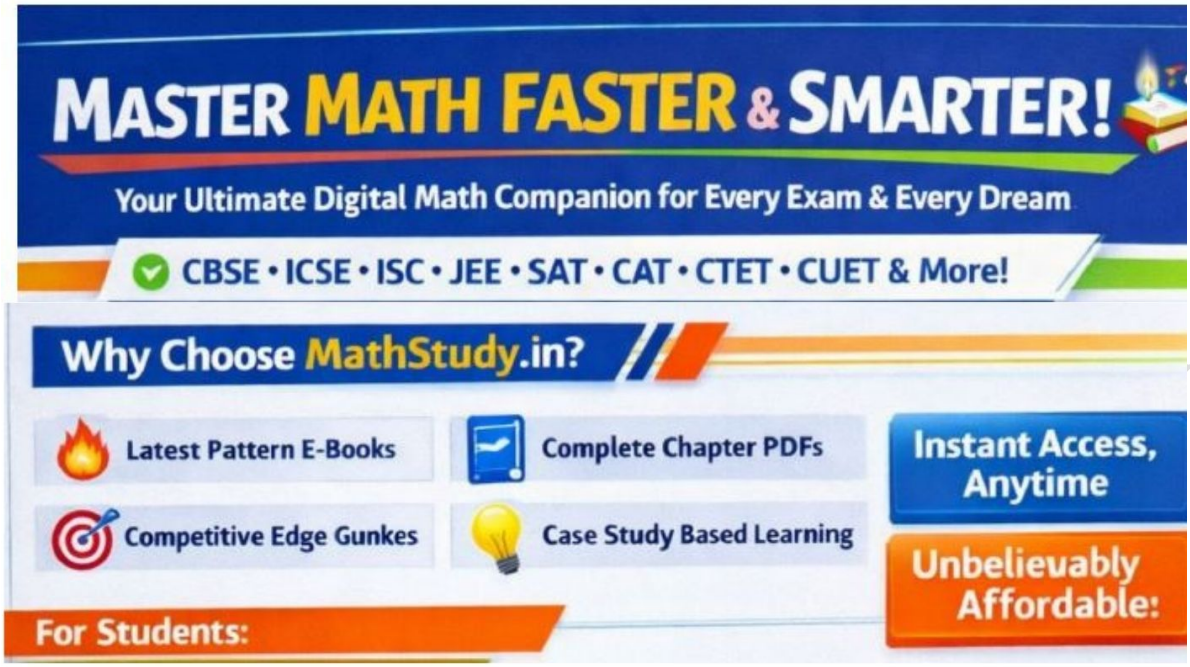

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PRACTICE QUESTION PAPER - V
CLASS XII - MATHEMATICS (041)

Time Allowed: 3 Hours **Maximum Marks: 80**

SECTION A (20 Marks)

This section comprises **20** *questions of* **1** *mark each. Questions 1-18 are Multiple Choice Questions (MCQs) and questions 19-20 are Assertion-Reason based questions.*

Multiple Choice Questions (MCQs)

1. (a) One-one but not onto
2. (a) 2
3. (b) $\frac{5\pi}{6}$
4. (a) $(-\infty, -1] \cup [1, \infty)$
5. (c) 1
6. (b) ± 3
7. (b) Skew-symmetric matrix
8. (c) 6
9. (b) $\begin{bmatrix} -\frac{1}{2} & \frac{3}{2} \\ 1 & -2 \end{bmatrix}$
10. (b) 2
11. (c) 0
12. (a) $\frac{y(2x^2-1)}{x(1-2y^2)}$
13. (a) $\sin x$
14. (a) $\frac{2}{5}$
15. (a) $(0, \frac{\pi}{2})$
16. (d) $-2^{-y} = \frac{2^{-x}}{\log 2} + C$
17. (a) 0
18. (b) $\frac{1}{3}$
19. (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion
20. (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion

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SECTION B (10 Marks)

This section comprises **5** *questions of* **2** *marks each.*

21. $\dfrac{5}{1-x^2}$
22. $\lambda = 10$
23. Verified: $x^2\dfrac{dy}{dx} = y$
24. $x = -2, -14$
25. $\dfrac{1}{3}$

SECTION C (18 Marks)

This section comprises **6** *questions of* **3** *marks each.*

26. $\sin^{-1}\left(\frac{4}{5}\right) + \cos^{-1}\left(\frac{12}{13}\right) = \sin^{-1}\left(\frac{63}{65}\right)$
27. $\log|x-1| - \frac{1}{x-1} - \log|x+2| + C$
28. $y = -2x + 4$
29. 0 (Lines intersect)
30. Verified: $A \cdot adj(A) = |A|I = \begin{bmatrix} -2 & 0 \\ 0 & -2 \end{bmatrix}$
31. Maximize $Z = 50x + 60y$ subject to $300x + 400y \leq 15000$, $x + y \leq 40$, $x \geq 0$, $y \geq 0$

SECTION D (20 Marks)

This section comprises **4** *questions of* **5** *marks each.*

33. Area $= \frac{49}{4}$ sq. units
34. $AB = I$, $x = 4, \quad y = 1, \quad z = 3$
35. $r = \frac{R}{2}$
36. $\vec{r} \cdot (-7\hat{i} + 17\hat{j} - 3\hat{k}) + 18 = 0$

SECTION E (12 Marks)

This section comprises **3** *case study based questions of* **4** *marks each.*

37. (i) $R(x) = 10x - 0.005x^2$

    (ii) Marginal Profit at $x = 20$ is 4.4

    OR

    (iii) Profit is maximum at $x = 167$

38. (i) $P(X = 2) = 0.0729$

    (ii) $P(X \leq 1) = 0.91854$

    OR

    (iii) Mean $= 0.5$

39. (i) Normal vector $= \langle 1, 2, -2 \rangle$

    (ii) Shortest distance $= \frac{4}{3}$ units

    OR

    (iii) Required plane: $x + 2y - 2z = 0$