PART 1 - MATHEMATICS

Topic : Matrices

SECTION–1 : (Maximum Marks : 3)

- This section contains **ONE** question.
- Each question has **TWO** lists: **List-I** and **List-II**.
- Four options are given representing matching of elements from List-I and List-II. **ONLY ONE** of these four options corresponds to a correct matching.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated according to the following marking scheme :

Full Marks	: +3	If ONLY the correct option is chosen;
Zero Marks	: 0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	: −1	In all other cases.

1. Let α and β be the distinct roots of the equation $x^2 + x - 1 = 0$. Consider the set $T = \{1, \alpha, \beta\}$. For a 3×3 matrix $M = (a_{ij})_{3\times 3}$, define $R_i = a_{i1} + a_{i2} + a_{i3}$ and $C_j = a_{1j} + a_{2j} + a_{3j}$ for i = 1,2,3 and j = 1,2,3.

Match each entry in **List-I** to the correct entry in **List-II**. [JEE Advanced 2024 Paper 1]

	List-I		List-II
P.	The number of matrices $M = (a_{ij})_{3\times 3}$ with all entries in T such that $R_i = C_j = 0$ for all i,j, is	1.	1
Q.	The number of symmetric matrices $M = (a_{ij})_{3\times 3}$ with all entries in T such that $C_j = 0$ for all j, is	2.	12
R.	Let $M = (a_{ij})_{3\times 3}$ be a skew symmetric matrix such that $a_{ij} \in T$ for $i > j$. Then the number of elements in the set $\left\{ \begin{pmatrix} x \\ y \\ z \end{pmatrix} : x, y, z \in \mathbb{R},\ M \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} a_{12} \\ 0 \\ -a_{23} \end{pmatrix} \right\}$ is	3.	infinite
S.	Let $M = (a_{ij})_{3\times 3}$ be a matrix with all entries in T such that $R_i = 0$ for all i. Then the absolute value of the determinant of M is	4.	6
		5.	0

(A) (P) → (4) (Q) → (2) (R) → (5) (S) → (1)
(B) (P) → (2) (Q) → (4) (R) → (1) (S) → (5)
(C) (P) → (2) (Q) → (4) (R) → (3) (S) → (5)
(D) (P) → (1) (Q) → (5) (R) → (3) (S) → (4)

Scan or tap for the full solution

Space for Rough Work

JEE ADVANCED MATRICES — TRANSPOSE, SYMMETRIC AND SKEW-SYMMETRIC MATRICES — PYQS

Test Pattern : **JEE (Advanced)**

ANSWER KEY

SECTION–1																													
Ques.	1																												
Ans.	**C**																												