

PART 1 - MATHEMATICS

Topic : Determinants

SECTION-1 : (Maximum Marks : 4)

- This section contains **ONE** question.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
- For each question, choose the option(s) corresponding to (all) the correct answer(s).
- Answer to each question will be evaluated according to the following marking scheme :

Full Marks	: +4	ONLY if (all) the correct option(s) is(are) chosen;
Partial Marks	: +3	If all the four options are correct but ONLY three options are chosen;
Partial Marks	: +2	If three or more options are correct but ONLY two options are chosen, both of which are correct;
Partial Marks	: +1	If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks	: 0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	: -2	In all other cases.
- For example, in a question, if **(A), (B) and (D)** are the ONLY three options corresponding to correct answers, then choosing ONLY (A), (B) and (D) will get +4 marks; choosing ONLY (A) and (B) will get +2 marks; choosing ONLY (A) and (D) will get +2 marks; choosing ONLY (B) and (D) will get +2 marks; choosing ONLY (A) will get +1 mark; choosing ONLY (B) will get +1 mark; choosing ONLY (D) will get +1 mark; choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get -2 marks.

1. Let R^2 denote $R \times R$. Let

$$S = \{(a, b, c) : a, b, c \in R \text{ and } ax^2 + 2bxy + cy^2 > 0 \text{ for all } (x, y) \in R^2 - \{(0, 0)\}\}.$$

Then which of the following statements is (are) TRUE?

[JEE Advanced 2024 Paper 1]

(A) $\left(2, \frac{7}{2}, 6\right) \in S$

(B) If $\left(3, b, \frac{1}{12}\right) \in S$, then $|2b| < 1$.

(C) For any given $(a, b, c) \in S$, the system of linear equations

$$ax + by = 1$$

$$bx + cy = -1$$

has a unique solution.

(D) For any given $(a, b, c) \in S$, the system of linear equations

$$(a + 1)x + by = 0$$

$$bx + (c + 1)y = 0$$

has a unique solution.

Scan or tap for the full solution



Space for Rough Work

JEE ADVANCED DETERMINANTS — CONSISTENCY OF
SYSTEM OF EQUATIONS, CRAMER'S RULE (JEE) — PYQS

Test Pattern : JEE (Advanced)

ANSWER KEY

SECTION-1

Ques.	1																
Ans.	B, C, D																