

PART 1 - MATHEMATICS

Topic : Application of derivatives

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 $\mathbb{R}$ denote the set of all real numbers. Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by

$$f(x) = \begin{cases} \frac{6x + \sin x}{2x + \sin x} & \text{if } x \neq 0, \\ \frac{7}{3} & \text{if } x = 0. \end{cases}$$

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

[JEE Advanced 2025 Paper 2]

- (A) The point $x = 0$ is a point of local maxima of f
- (B) The point $x = 0$ is a point of local minima of f
- (C) Number of points of local maxima of f in the interval $[\pi, 6\pi]$ is 3
- (D) Number of points of local minima of f in the interval $[2\pi, 4\pi]$ is 1

Scan or tap for the
full solution



Space for Rough Work

**JEE ADVANCED APPLICATION OF DERIVATIVES —
MAXIMA AND MINIMA: FIRST AND SECOND DERIVATIVE
TESTS — PYQS**

Test Pattern : JEE (Advanced)

ANSWER KEY

SECTION-1

Ques.	1																	
Ans.	B, C, D																	