PART 1 - MATHEMATICS

Topic : Integrals

SECTION–1 : (Maximum Marks : 3)

- This section contains **ONE** question.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- 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. The value of the definite integral

$$\int_0^2 \frac{1}{3^x+3}\,dx$$

is

[JEE Advanced 2026 Paper 2]

(A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{\log_e 3}{3}$ (D) $\frac{\log_e 3}{2}$

Scan or tap for the full solution

Space for Rough Work

SECTION–2 : (Maximum Marks : 9)

- This section contains **ONE** paragraph.
- Based on each paragraph, there are **THREE** questions.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value of the answer (in decimal notation, truncated / rounded-off to the **SECOND DECIMAL PLACE**; e.g. 6.25, 7.00, −0.33, −.30, 30.27, −127.30) in the place designated to enter the answer.
- Answer to each question will be evaluated according to the following marking scheme :

Full Marks : +3 If ONLY the correct answer is entered;
Zero Marks : 0 In all other cases.

2. If

$$\alpha = \int_{\frac{1}{2}}^{2} \frac{\tan^{-1} x}{2x^2 - 3x + 2}\, dx,$$

then the value of $\sqrt{7}\tan\left(\frac{2\alpha\sqrt{7}}{\pi}\right)$ is _____.

(Here, the inverse trigonometric function $\tan^{-1} x$ assumes values in $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$.) [JEE Advanced 2025 Paper 2]

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Paragraph for Questions 3 and 4

Let $f : \left[0, \frac{\pi}{2}\right] \longrightarrow [0, 1]$ be the function defined by $f(x) = \sin^2 x$ and let $g : \left[0, \frac{\pi}{2}\right] \longrightarrow [0, \infty)$ be the function defined by $g(x) = \sqrt{\frac{\pi x}{2} - x^2}$.

3. The value of $2\int_0^{\frac{\pi}{2}} f(x)g(x)\,dx - \int_0^{\frac{\pi}{2}} g(x)\,dx$ is _____. [JEE Advanced 2024 Paper 2]

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4. The value of $\frac{16}{\pi^3}\int_0^{\frac{\pi}{2}} f(x)g(x)\,dx$ is _____. [JEE Advanced 2024 Paper 2]

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Space for Rough Work

PYQSide

TEST SERIES
(Academic Session : 2026-2027)

JEE ADVANCED INTEGRALS — PROPERTIES OF DEFINITE INTEGRALS — PYQS

Test Pattern : **JEE (Advanced)**

ANSWER KEY

SECTION–1

Ques.	1
Ans.	**B**

SECTION–2

Ques.	2	3	4
Ans.	**21**	**0**	**0.25**