

Jee Main 2026 B.Arch and B. Planning Memory Based Question Paper

Time Allowed :3 Hours	Maximum Marks :300	Total questions :75
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Important Instructions

1. The test is of 3 hours duration.
2. This test paper consists of 75 questions. Each subject (PCM) has 25 questions. The maximum marks are 300.
3. This question paper contains Three Parts. Part-A is Physics, Part-B is Chemistry, and Part-C is Mathematics. Each part has only two sections: Section-A and Section-B.
4. Section-A: Attempt all questions.
5. Section-B: Attempt all questions.
6. **Section-A (01 – 20):** Contains 20 multiple choice questions which have only one correct answer. Each question carries +4 marks for the correct answer and –1 mark for the wrong answer.
7. **Section-B (21 – 25):** Contains 5 Numerical value-based questions. The answer to each question should be rounded off to the nearest integer. Each question carries +4 marks for the correct answer and –1 mark for the wrong answer.

1. If

$$a_n = (2n^2 - n + 2)(n!),$$

then

$$\sum_{n=1}^{20} a_n$$

is equal to:

- (1) $37(20!) - 1$
- (2) $37(20!) + 1$
- (3) $39(21!) + 1$
- (4) $39(21!) - 1$

2. Let $x = x(t)$ be the solution curve of the differential equation

$$\frac{dx}{dt} = -kx,$$

with

$$x(0) = 100, \quad x\left(\frac{1}{2}\right) = 80.$$

If $x(t_\alpha) = 5$, then t_α is equal to:

- (1) $\frac{\ln 5 + \ln 4}{2(\ln 5 - \ln 4)}$
 - (2) $\frac{\ln 5 + \ln 4}{\ln 5 - \ln 4}$
 - (3) $\frac{\ln 5 - \ln 4}{2(\ln 5 + \ln 4)}$
 - (4) $\frac{\ln 5 - \ln 4}{\ln 5 + \ln 4}$
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3. Let α, β, γ ($0 < \alpha, \beta, \gamma < \frac{\pi}{2}$) be the angles between non-zero vectors $\vec{a}$ and $\vec{b}$, $\vec{b}$ and $\vec{c}$, $\vec{c}$ and $\vec{a}$ respectively. If θ is the angle that the vector $\vec{a}$ makes with the plane containing $\vec{b}$ and $\vec{c}$, then:

- (1) $\cos^2 \theta = {}^2\beta (\cos^2 \alpha + \cos^2 \gamma - 2 \cos \alpha \cos \beta \cos \gamma)$
 - (2) $\cos^2 \theta = \sec^2 \beta (\cos^2 \alpha + \cos^2 \gamma + 2 \cos \alpha \cos \beta \cos \gamma)$
 - (3) $\sin^2 \theta = {}^2\beta (\cos^2 \alpha + \cos^2 \gamma - 2 \cos \alpha \cos \beta \cos \gamma)$
 - (4) $\sin^2 \theta = \sec^2 \beta (\cos^2 \alpha + \cos^2 \gamma + 2 \cos \alpha \cos \beta \cos \gamma)$
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4. Let α and β be the roots of the equation

$$2x^2 - 5x - 1 = 0.$$

For $n \in \mathbb{N}$, let

$$P_n = \alpha^n + \beta^n.$$

Then the value of

$$\frac{2P_{11}(2P_{10} - 5P_9)}{P_8(5P_{10} + P_9)}$$

is equal to:

- (1) $-\frac{1}{2}$
 - (2) $\frac{1}{2}$
 - (3) -1
 - (4) 1
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5. For three non-coplanar vectors $\vec{a}, \vec{b}, \vec{c}$, if

$$(\vec{b} + \vec{c}) \cdot ((\vec{c} + \vec{a}) \times (\vec{a} + \vec{b})) = \alpha [\vec{a} \vec{b} \vec{c}]$$

and

$$(\vec{a} + \vec{b}) \cdot ((\vec{b} + \vec{c}) \times (\vec{a} + \vec{b} + \vec{c})) = \beta [\vec{a} \vec{b} \vec{c}],$$

then $\alpha + \beta$ is equal to:

- (1) -3
- (2) -1

- (3) 1
 - (4) 3
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6. Let X have a binomial distribution $B(6, p)$. If the sum of the mean and the variance of X is $\frac{21}{8}$, then

$$\frac{P(2 \leq X < 4)}{P(4 < X < 6)}$$

is equal to:

- (1) 65
 - (2) 195
 - (3) $\frac{195}{2}$
 - (4) $\frac{225}{2}$
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