

JEE Main 2025 Apr 7 Shift 1 Question Paper

Time Allowed :3 Hour	Maximum Marks :300	Total Questions :75
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General Instructions

Read the following instructions very carefully and strictly follow them:

1. The test is of 3 hours duration.
2. The question paper consists of 75 questions. The maximum marks are 300.
3. There are three parts in the question paper consisting of Physics, Chemistry and Mathematics having 25 questions in each part of equal weightage.
4. Each part (subject) has two sections.
 - (i) Section-A: This section contains 20 multiple choice questions which have only one correct answer. Each question carries 4 marks for correct answer and –1 mark for wrong answer.
 - (ii) Section-B: This section contains 5 questions. The answer to each of the questions is a numerical value. Each question carries 4 marks for correct answer and –1 mark for wrong answer. For Section-B, the answer should be rounded off to the nearest integer.

1. The dimensions of a physical quantity $\epsilon_0 \frac{d\Phi_E}{dt}$ are similar to [Symbols have their usual meanings]

- (A) Electric charge
- (B) Electric current
- (C) Electric flux
- (D) Electric field

2. In a resonance tube closed at one end. Resonance is obtained at lengths $l_1 = 120$ cm and $l_2 = 200$ cm. If $v_s = 340$ m/s, find the frequency of sound.

- (A) 500 Hz

- (B) 1000 Hz
 - (C) 1500 Hz
 - (D) 2000 Hz
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3. Two plane polarized light waves combine at a certain point, whose "E" components are:

$$E_1 = E_0 \sin \omega t, \quad E_2 = E_0 \sin \left(\omega t + \frac{\pi}{3} \right)$$

Find the amplitude of the resultant wave.

- (A) E_0
 - (B) $0.9E_0$
 - (C) $1.7E_0$
 - (D) $3.4E_0$
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4. The remainder when 64^{64} is divided by 7 is equal to:

- (A) 4
 - (B) 3
 - (C) 2
 - (D) 1
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5. Let A be a set defined as $A = \{2, 3, 6, 9\}$. Find the number of singular matrices of order 2×2 such that elements are from the set A .

- (A) 4
 - (B) 3
 - (C) 2
 - (D) 1
-

6. The area bounded by the curves $y = 4 - \frac{x^2}{4}$ and $y = \frac{x-4}{2}$ (in square units) is:

- (A) $\frac{20}{3}$
- (B) $\frac{120}{3}$

(C) $\frac{80}{3}$

(D) $\frac{125}{3}$

7. A compound having molecular formula MX_3 has van't Hoff factor of 2. What is the degree of dissociation?

1) 0.25

2) 0.5

3) 0.3

4) 0.75

8. The dimensions of a physical quantity $\epsilon_0 \frac{d\Phi_E}{dt}$ are similar to:

(1) Electric current

(2) Electric field

(3) Electric flux

(4) Electric charge

9. Let A be a set defined as $A = \{2, 3, 6, 9\}$. Find the number of singular matrices of order 2×2 such that elements are from the set A .

(A) 4

(B) 3

(C) 2

(D) 1

10. A lens of focal length 20 cm in air is made of glass with a refractive index of 1.6. What is its focal length when it is immersed in a liquid of refractive index 1.8?

(1) -36 cm

(2) -72 cm

(3) -60 cm

(4) -108 cm

11. Transition metal belonging to the 3d series having the lowest enthalpy of atomization in its most stable oxidation state forms oxide MO. Nature of the oxide is:

- (1) Highly acidic
 - (2) Amphoteric
 - (3) Highly basic
 - (4) Neutral
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12. If x_1, x_2, x_3, x_4 are in GP (Geometric Progression), then we subtract 2, 4, 7, and 8 from x_1, x_2, x_3, x_4 respectively, then the resultant numbers are in AP (Arithmetic Progression).

Then the value of $\frac{1}{24}(x_1 \cdot x_2 \cdot x_3 \cdot x_4)$ is:

- (1) $\frac{2^4}{3^8}$
 - (2) $\frac{2^3}{3^9}$
 - (3) $\frac{2}{3^9}$
 - (4) $\frac{2}{3^8}$
-

13. A composite sound wave is represented by $y = A \cos \omega t \cdot \cos \omega' t$. The observed beat frequency is:

- (1) $\frac{\omega - \omega'}{2\pi}$
 - (2) $\frac{\omega - \omega'}{\pi}$
 - (3) $\frac{\omega}{2\pi}$
 - (4) $\frac{\omega'}{\pi}$
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14. Given below are two statements: - Assertion (A): Sodium on reaction with alcohols liberates H_2 gas. - Reason (R): Alcohols are acidic in nature.

In the light of the above statements, choose the correct answer from the options below:

- (1) Both A and R are correct and R explains A.
 - (2) Both A and R are correct but R does not explain A.
 - (3) A is correct, R is incorrect.
 - (4) A is incorrect, R is correct.
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15. If α and β are negative real roots of the quadratic equation $x^2 - (p + 2)x + (2p + 9) = 0$ and $p \in (\alpha, \beta)$. Then the value of $\beta^2 - 2\alpha$ is:

- (1) 11
 - (2) 13
 - (3) 7
 - (4) 5
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