

JEE Main 2025 Apr 8 Shift 2 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. Consider the last electron of an element having atomic number 9 and choose the correct option.

- (1) Sum of total nodes = 1
- (2) $n = 2; l = 0$
- (3) Last electron enters in 2s subshell
- (4) There are $5e^-$ with $l = 0$

2. The number of rational terms in the binomial expansion of $\left(\frac{1}{2} + \frac{1}{8}\right)^{1016}$ is

- (1) 129

- (2) 128
 - (3) 127
 - (4) 130
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3. Find the output voltage in the given circuit.

- (1) +5 volt
 - (2) Zero
 - (3) 10 volt
 - (4) -5 volt
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4. Which of the following has sp^3d^2 hybridisation?

- (1) $[NiCl_4]^{2-}$
 - (2) $[Ni(CO)_4]$
 - (3) SF_6
 - (4) $[Ni(CN)_4]^{2-}$
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5. Atomic number of element with lowest first ionisation enthalpy is

- (1) 32
 - (2) 19
 - (3) 35
 - (4) 87
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6. Given the series

$$\begin{aligned}\frac{1}{1^4} + \frac{1}{2^4} + \frac{1}{3^4} + \cdots &= \frac{\pi^4}{90}, \\ \frac{1}{1^4} + \frac{1}{3^4} + \frac{1}{5^4} + \cdots &= \alpha, \\ \frac{1}{2^4} + \frac{1}{4^4} + \frac{1}{6^4} + \cdots &= \beta.\end{aligned}$$

Then find $\frac{\alpha}{\beta}$.

- (1) 15
- (2) 14

(3) 23

(4) 18

7. A fractional errors in x , y , and z are 0.1, 0.2, and 0.5 respectively. Find the maximum fractional error in $x^{-2}y^3z^{-2}$.

(1) 0.2

(2) 0.7

(3) 0.6

(4) 0.3

8. For a nucleus of mass number A and radius R , mass density ρ . Then choose the correct option.

(1) $\rho \propto A^{1/3}$

(2) ρ is independent of A

(3) $\rho \propto A$

(4) $\rho \propto A^3$

9. Consider the following statements:

Statement I: H_2Se is more acidic than H_2Fe

Statement II: H_2Se has higher bond dissociation enthalpy

In light of the above statements, choose the correct option.

(1) Statement-I is true Statement-II is false

(2) Statement-I is false Statement-II is true

(3) Both Statement-I Statement-II are true

(4) Both Statement-I Statement-II are false

10. There are 12 points in a plane in which 5 are collinear such that no three of them are in a straight line. Then, the number of triangles that can be formed from any 3 vertices from 12 points.

(1) 220

- (2) 210
 - (3) 230
 - (4) 240
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11. A convex lens ($f = 30$ cm) is in contact with a concave lens ($f = 20$ cm). The object is placed on the left side at a distance of 20 cm. Find the image distance.

- (1) 10 cm
 - (2) 20 cm
 - (3) 15 cm
 - (4) 25 cm
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12. There are two charged spheres of radius R and $3R$. When the spheres are made to touch each other and then separate, the surface charge density becomes r_1 and r_2 respectively. Find $\frac{r_1}{r_2}$.

- (1) $\frac{1}{9}$
 - (2) $\frac{1}{3}$
 - (3) 3
 - (4) 9
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13. Given $\lambda = \frac{2nc}{m}$ (linear charge density) for a wire which is passing through the body diagonal of a closed cube of side length $\sqrt{3}$ cm. Find the flux through the cube.

- (1) 1.44π
 - (2) 0.72π
 - (3) 2.16π
 - (4) 6.84π
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14. A monoatomic gas is stored in a thermally insulated container. The gas is suddenly compressed to $\frac{1}{8}$ of its initial volume. Find the ratio of final pressure to initial pressure.

- (1) 8
- (2) 16

(3) 4

(4) 32

15. Two balls are projected with the same speed at different angles. If the maximum height of the first ball is 2 times the maximum height of the second ball, find the ratio of their time of flight.

(1) $1 : 2\sqrt{2}$

(2) $2\sqrt{2} : 1$

(3) $2 : 1$

(4) $4 : 1$
