



YOUR
FUTURE
DEPENDS ON
WHAT YOU DO
TODAY

AIR 1

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Memory Based Questions and Answers

JEE MAIN 2026

SESSION 1

Test Date: 24th January 2026 | Shift 1

Instructions

- The test is of **3 hours** duration.
- This test paper consists of 75 questions. Each subject (PCM) has 25 questions. The maximum marks are 300.
- 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.
- Section - A: Attempt all questions.
- Section - B: Attempt all questions.
- Section - A (01–20) 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.
- 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 correct answer and -1 mark for wrong answer.



JEE Main 24th January 2026 (Shift-1)

[Memory-Based Questions]

PHYSICS

1. A cylindrical block of mass M and area of cross section A is floating in a liquid of density ρ and with its axis vertical. When depressed a little and released the block starts oscillating. The Period of oscillation is ____

(1) $2\pi\sqrt{\frac{\rho A}{Mg}}$ (2) $2\pi\sqrt{\frac{M}{\rho Ag}}$ (3) $\pi\sqrt{\frac{\rho A}{Mg}}$ (4) $\pi\sqrt{\frac{2M}{\rho Ag}}$

Ans: (2)

2. Two masses 400 g and 350 g are suspended from the ends of a light string passing over a heavy pulley of radius 2 cm. When released from rest the heavier mass is observed to fall 81 cm in 9s. The rotational inertia of the pulley is _____ kgm^2 . ($g = 9.8 \text{ m/s}^2$).

(1) 4.75×10^{-3} (2) 1.86×10^{-2} (3) 9.5×10^{-3} (4) 8.3×10^{-3}

Ans: (3)

3. Three charges $+2q$, $+2q$ and $-4q$ are situated at $(0, -3a)$, $(2a, 0)$ and $(-2a, 0)$ respectively in the xy plane. The resultant dipole moment about origin is ____.

(1) $2qa(3\hat{i} - 7\hat{j})$ (2) $2qa(3\hat{j} - 7\hat{i})$ (3) $2qa(7\hat{i} - 3\hat{j})$ (4) $2qa(3\hat{j} - \hat{i})$

Ans: (3)

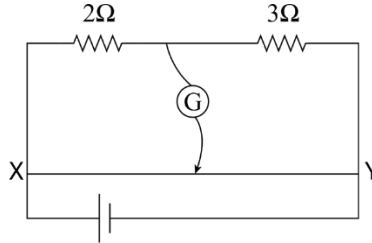
4. Three masses 200 kg , 300 kg and 400 kg are placed at the vertices of an equilateral triangle with sides 20 m. They are rearranged on the vertices of a bigger triangle of side 25 m and with the same center. The work done in this process ____.

(Gravitational constant $G = 6.7 \times 10^{-11} \text{ N m}^2/\text{kg}^2$).

(1) 2.85×10^{-7} (2) 4.77×10^{-7} (3) 9.86×10^{-6} (4) 1.74×10^{-7}

Ans: (2)

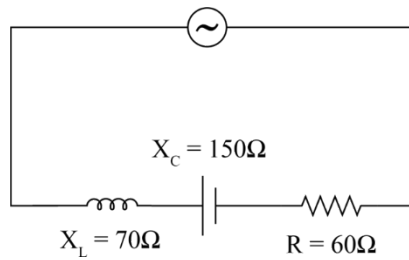
5. Two resistors 2Ω and 3Ω are connected in the gaps of bridge as shown in figure. The null points is obtained with the contact of jockey at some point on wire XY. When an unknown resistor is connected in parallel with 3Ω resistor, the null point is shifted by 22.5 cm towards Y the resistance of unknown resistor is ____



- (1) 4 (2) 3 (3) 1 (4) 2

Ans: (4)

6. For the series LCR circuit connected with 220 V , 50 Hz AC source as shown in the figure the power factor is $\frac{\alpha}{10}$. The value of α is ___.



- (1) 10 (2) 4 (3) 6 (4) 8

Ans: (3)

7. The exit surface of a prism with refractive index n is coated with a material having refractive index $\frac{n}{2}$. When this prism is set for minimum angle of deviation it exactly meets the condition of critical angle. The prism angle is ___ .

- (1) 15° (2) 60° (3) 45° (4) 30°

Ans: (2)

8. A spring of force constant 15 N/m is cut into two pieces. if the ratio of their length is 1: 3 then the force constant of smaller piece is ___ N/m

- (1) 45 (2) 15 (3) 60 (4) 20

Ans: (3)



9. EM waves and their source are given

Column - I

Column - II

(a) X-rays

(p) Hot bodies and molecules

(b) Infrared Rays

(q) Oscillatory current in Antennas

(c) Microwaves

(r) Magnetron

(d) Radio waves

(s) Fast moving electrons striking a metal plate

(1) a(p), b(q), c(r), d(s)

(2) a(s), b(r), c(q), d(p)

(3) a(s), b(p), c(q), d(r)

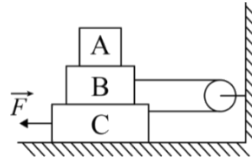
(4) a(s), b(p), c(r), d(q)

Ans: (4)

10. Sixty four rain drops of radius 1 mm each falling down from the terminal velocity of 10 cm/s combine to form a bigger drop. The terminal velocity of bigger drop is ___ cm/s.

Ans: (160)

11. In the figure the block A, B & C weigh 4 kg, 6 kg and 8 kg respectively. The coefficient of sliding friction b/w two surfaces is 0.5. The force \vec{F} required to slide the block C with constant speed is ___ N.



Ans: (90)

12. Two electrons are moving in orbits of two hydrogen like atoms with speeds 3×10^5 m/s and 2.5×10^5 m/s respectively. If the radii of these orbits are nearly same then the possible order of energy states are ___ respectively.

(1) 9 and 8

(2) 10 and 12

(3) 8 and 10

(4) 6 and 5

Ans: (4)

13. The electrostatic potential in a charged spherical region, radius r varies as $(v = ar^3 + b)$ where a and b are constants. The total charge in the sphere is_____.

(1) $\frac{1}{8}$

(2) $\frac{1}{9}$

(3) $\frac{1}{12}$

(4) $\frac{1}{6}$

Ans: ($\frac{1}{12} \pi \epsilon_0 aR^4$)



14. In a microscope of tube length 10cm two convex lenses are arranged with focal length of 2 cm and 5 cm. Total magnification obtained with this system, for normal adjustment is $(5)^k$. The value of k is ____

(1) 4 (2) 5 (3) 2 (4) 3.5

Ans: (3)

15. There are three co-centric conducting spherical shells A , B and C of radii a , b and c respectively ($c > b > a$) and they are charged q_1, q_2, q_3 respectively. The potential of the sphere A, B and C respectively are.

(1) $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{a} \right), \frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2}{b} + \frac{q_3}{c} \right), \frac{1}{4\pi\epsilon_0} \left(\frac{q_1}{a} + \frac{q_2}{b} + \frac{q_3}{c} \right)$

(2) $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1}{a} + \frac{q_2}{b} + \frac{q_3}{c} \right), \frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{b} \right), \frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{c} \right)$

(3) $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{a} \right), \frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{b} \right), \frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{c} \right)$

(4) $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1}{a} + \frac{q_2}{b} + \frac{q_3}{c} \right), \frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2}{b} + \frac{q_3}{c} \right), \frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{c} \right)$

Ans: (4)

16. A brass wire of length 2 m and radius 1 mm at 27°C is held taut between two rigid supports. Initially it was cooled to temperature- of 43°C, creating a tension T in the wire. The temperature to which the wire has to be cooled in order to increase the tension in it to 1.4T is ____°C

(1) 280 (2) 265 (3) 271 (4) 286

Ans: (3)

17. Density of water at 4°C and 20°C are 1000 kg/m³ and 998 kg/m³ respectively. The increase in internal energy of 4 kg of water when it is heated from 4°C to 20°C is ____ J (specific heat capacity of water = 4.2 J/g°C and 1 atmospheric pressure = 10⁵ Pa)

(1) 268799.2 (2) 315826.2 (3) 258700.8 (4) 234699.2

Ans: (1)



18. Match the following

A)	Magnetic induction	I	$MLT^{-2}A^{-2}$
B)	Magnetic flux	II	$ML^2T^{-2}A^{-2}$
C)	Magnetic permeability	III	$ML^0T^{-2}A^{-1}$
D)	Self inductance	IV	$ML^2T^{-2}A^{-1}$

(1) A - III, B-IV, C-II, D-I

(2) A-I, B-III, C-IV, D-II

(3) A-IV, B-III, C-IV, D-II

(4) A-III, B-IV, C - I, D - II

Ans: (4)

19. **Statement-I:** For all elements, greater the mass of the nucleus greater is the binding energy per nucleon.

Statement-II: For all elements, a nuclei with less binding energy per nucleon transforms to a nuclei with greater binding energy per nucleon.

(1) Statement - I is true but Statement - II is False

(2) Both Statement-I and Statement -II are True

(3) Both Statement -I and Statement -II are False

(4) Statement -I is False and Statement -II is True

Ans: (4)

20. A boy throws a ball into air at 45° from the horizontal to land it on a roof of a building of height H. If the ball attains maximum height in 2 sec and land on the building in 3 sec after launch, then value of H is ___ m. ($g = 10 \text{ m/s}^2$)

(1) 15

(2) 20

(3) 10

(4) 25

Ans: (1)

21. A voltage regulating circuit consisting of zener diode, having breakdown voltage of 10 V and maximum power dissipation of 0.4 W is operated at $1\sqrt{2}$. The approximate value of protective resistance in this circuit is_____

Ans: (125)



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22. An unpolarised light is incident at an interface of two dielectric media having refractive indices of 2 and $2\sqrt{3}$ respectively to satisfy the condition that reflected, and refracted rays are perpendicular to each other, the angle of incidence is

- (1) 30° (2) 60° (3) 95° (4) 10°

Ans: (2)

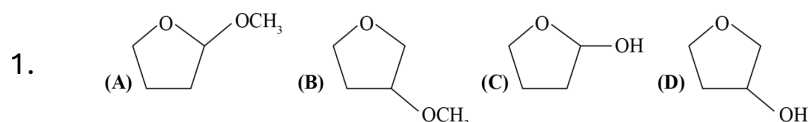
23. Two resistors of 100Ω each are connected in series, with a 9V battery. A voltmeter of 400Ω resistance is connected to measure the voltage drop across one of the resistors. The voltmeter reading is ___ V.

- (1) 4.5 (2) 4 (3) 3 (4) 2

Ans: (2)



CHEMISTRY



A student is given one compound among the following compounds that gives positive test with Tollens' reagent.

The compound is :

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

Ans: (1)

2. X and Y are the number of electrons involved respectively during the oxidation of I^- to I_2 and S^{2-} to S by acidified $K_2Cr_2O_7$. The value of $X + Y$ is ____ .

Ans: (12)

3. In Dumas method for estimation of Nitrogen, 0.5 g of an Organic compound gave 70 mL of Nitrogen collected at 300K and 715 mm pressure.
The percentage of Nitrogen in the Organic compound is ____ .
(Aqueous tension at 300K is 15 mm)

Ans: (14.67)

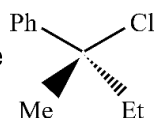
4. Two solutes A and B of 0.3 g and 0.9 g respectively dissolved in 100 mL of solution (molar mass of A and B are 30 g/mol and 90 g/mol respectively). Calculate the osmotic pressure of the solution at 300 K (in atm). (Volume = 100mL)

Ans: (5)

5. Given below are two statements.

Statement I : C-Cl bond is stronger in $CH_2=CHCl$ than CH_3CH_2Cl .

Statement II : The given optically active molecule



on hydrolysis gives solution

that can rotate the plane-polarized light.

In the light of the above statements, which is the **correct** option.

- 1) Both statement-I and statement-II are correct.
2) Both statement-I and statement-II are incorrect.



3) Statement-I is correct and statement-II is incorrect.

4) Statement-I is incorrect and statement-II is correct.

Ans: (1)

6. In H-like species, the ratio of the speed of the electron in two orbits is 3 : 2, then the ratio of energy for these electrons is

(1) 2 : 3

(2) 9 : 4

(3) 2 : 1

(4) 5 : 3

Ans: (2)

7. Which of following compounds contains 3 unpaired electrons?

(1) V_2O_5

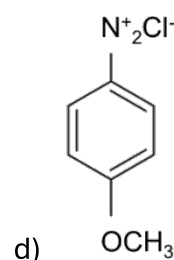
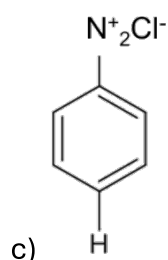
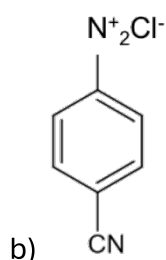
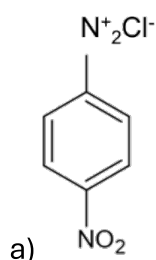
(2) $[TiF_6]^{3-}$

(3) $[CoF_6]^{4-}$

(4) $[Fe(CN)_6]^{3-}$

Ans: (3)

8. The correct order of stability of following diazonium ions is



(1) $a > b > c > d$

(2) $d > c > b > a$

(3) $a < b < c < d$

(4) $a > b < c < d$

Ans: (2)

9. Match the following List-I with List-II and choose the **correct** option.

List-I		List-II	
(a)		(i)	Vinyl chloride
(b)		(ii)	Allyl chloride
(c)		(iii)	Aryl Chloride



(d)		(iv)	Benzyl chloride
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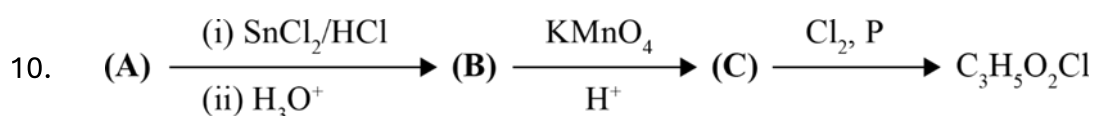
(1) a(i), b(ii), c(iii), d(iv)

(2) a(iv), b(i), c(ii), d(iii)

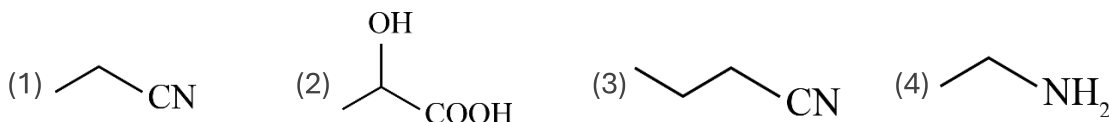
(3) a(iv), b(ii), c(iii), d(i)

(4) a(i), b(ii), c(iv), d(iii)

Ans: (4)



Final product has one chiral center. Structure of A is,

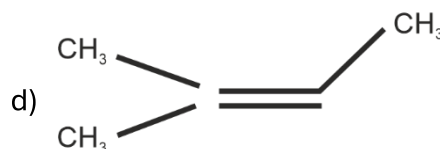
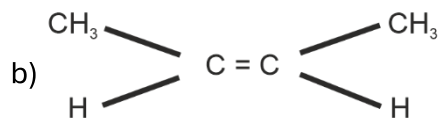
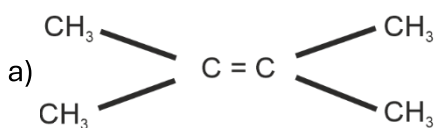


Ans: (1)

11. When Benzene (78 gm) react with nitrating mixture it form product A, which further react with Br₂ in presence of Fe and produce B. B on further show reduction with Fe/HCl and after diazotization give C, (salt) and the C on reaction with CuBr/HBr give product D. Find out mass of product D obtained in grams.

Ans: (236)

12. Decreasing order of stability of following



(1) a>d>c>b

(2) a>b>c>d

(3) a>c>b>d

(4) a>d>b>c

Ans: (1)



17. Match the following List-I with List-II and choose the **correct** option.

List-I (Isothermal process for ideal gas system)		List-II (Work done)	
(a)	Reversible expansion	(i)	$W = 0$
(b)	Free expansion	(ii)	$W = -nRT \ln \frac{V_f}{V_i}$
(c)	Irreversible expansion	(iii)	$W = -P_{\text{ext}} (V_f - V_i)$
(d)	Irreversible compression	(iv)	$W = -P_{\text{ext}} (V_i - V_f)$

(1) a(iv), b(ii), c(iii), d(i)

(2) a(i), b(iii), c(ii), d(iv)

(3) a(iv), b(i), c(iii), d(ii)

(4) a(ii), b(i), c(iii), d(iv)

Ans: (4)



MATHEMATICS

1. Number of real solutions of $x|x - 3| + |x - 1| - 2 = 0$ ____

Ans: (2)

2. Consider an A.P $a_1, a_2 \dots a_n; a_1 > 0, a_2 - a_1 = \frac{-3}{4}, a_n = \frac{1}{4}a_1$ and $\sum_{i=1}^n a_i = \frac{525}{2}$ then $\sum_{i=1}^{17} a_i$ is equal to

- (1) 476 (2) 136 (3) 952 (4) 238

Ans: (4)

3. The value of $\frac{\sqrt{3}\operatorname{cosec}20^\circ - \sec 20^\circ}{\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ}$ is

Ans: (64)

4. If $\cot x = \frac{5}{12}$ for some $x \in \left(\pi, \frac{3\pi}{2}\right)$ then $\sin 7x \left(\cos \frac{13x}{2} + \sin \frac{13x}{2}\right) + \cos 7x \left(\cos \frac{13x}{2} - \sin \frac{13x}{2}\right)$ is equal to

- (1) $\frac{1}{\sqrt{13}}$ (2) $\frac{4}{\sqrt{26}}$ (3) $\frac{5}{\sqrt{13}}$ (4) $\frac{6}{\sqrt{26}}$

Ans: (1)

5. Let the lines $L_1: \vec{r} = \hat{i} + 2\hat{j} + 3\hat{k} + \lambda(2\hat{i} + \hat{j} + 4\hat{k}), \lambda \in R$ and $L_2: \vec{r} = (4\hat{i} + \hat{j}) + \mu(5\hat{i} + \hat{j} + \hat{k}), \mu \in R$ intersect at the point R . Let P and Q be the points lying on lines L_1 & L_2 respectively such that $|PR| = \sqrt{29}$ and $|PQ| = \sqrt{\frac{47}{3}}$. If the point P lies in the first octant, then $27(QR)^2$ is equal to

- (1) 340 (2) 360 (3) 320 (4) 348

Ans: (2)

6. If the function $f(x) = \frac{e^x(e^{\tan x - x} - 1) + \log_x(\sec x + \tan x) - x}{\tan x - x}$ is continuous at $x = 0$, then the value of $f(0)$ is equal to

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

Ans: (4)



7. Let R be a relation defined on the set $A = \{1,2,3,4\}$ by $R = \{(a, b)R(c, d) : 2a + 3b = 3c + 4d\}$ then the number of elements in R is equal to

- (1) 6 (2) 15 (3) 12 (4) 16

Ans: (3)

8. Consider 10 data such that their mean is 10 and variance is 2. If one of the data α is removed and new data entry β is inserted. Now new mean is 10.1 and new variance is 1.99 then $(\alpha + \beta)$ is equal to

- (1) 10 (2) 20 (3) 1 (4) 2

Ans: (2)

9. Let $S = \left\{ Z \in C : \left| \frac{z-6i}{z-2i} \right| = 1 \text{ and } \left| \frac{z-8+2i}{z+2i} \right| = \frac{3}{5} \right\}$ then $\sum_{z \in S} |z|^2$ is equal to

- (1) 385 (2) 413 (3) 398 (4) 423

Ans: (1)

10. $S = \frac{1}{25!} + \frac{1}{3!23!} + \frac{1}{5!21!} + \dots$ up to 13 terms. If $13S = \frac{2^k}{n!}$, $k \in N$ then $n + k$ is equal to

- (1) 49 (2) 51 (3) 52 (4) 50

Ans: (1)

11. If $F(t) = \int \frac{1 - \sin(\ln t)}{1 - \cos(\ln t)} dt$ and $F(e^{\pi/2}) = -e^{\pi/2}$ then $F(e^{\pi/4})$ is

- (1) $(-1 - \sqrt{2})e^{\frac{\pi}{4}}$ (2) $(1 - \sqrt{2})e^{\frac{\pi}{4}}$ (3) $(1 + \sqrt{2})e^{\frac{\pi}{4}}$ (4) $(-2 - \sqrt{2})e^{\frac{\pi}{4}}$

Ans: (1)

12. From a lot containing 10 defective and 90 non-defective bulbs, 8 bulbs are selected one by one with replacement. Then the probability of getting at least 7 defective bulbs is.

- (1) $\frac{7}{10^7}$ (2) $\frac{81}{10^8}$ (3) $\frac{73}{10^8}$ (4) $\frac{67}{10^8}$

Ans: (3)

13. Consider a sequence 729, 81, 9, 1, Let P_n = product of first n terms of the given sequence and $\sum_{n=1}^{40} (P_n)^{\frac{1}{n}} = \frac{3^{\alpha-1}}{2 \times 3^{\beta}}$. Then the value of $\alpha + \beta$ is

- (1) 73 (2) 75 (3) 76 (4) 81

Ans: (1)



14. Let a circle of radius 4 pass through the origin 0, the points $A(-\sqrt{3}a, 0)$ and $B(0, -\sqrt{2}b)$, Where a and b are real parameters $ab \neq 0$. Then the locus of centroid of $\triangle OAB$ is a circle of radius r is equal to

(1) $\frac{7}{3}$ (2) $\frac{11}{3}$ (3) $\frac{8}{3}$ (4) $\frac{5}{3}$

Ans: (3)

15. Domain of the function $f(x) = \log_{(10x^2-17x+7)}(18x^2 - 11x + 1)$ is $(-\infty, a) \cup (b, c) \cup (d, \infty) - \{e\}$, then $90(a + b + c + d + e)$ is ____

(1) 307 (2) 177 (3) 316 (4) 170

Ans: (3)

16. Find number of 4 digit numbers which are greater than 5000 and less than 9000 such that they are also divisible by 3 and that can be formed using the digits 0,1,2,5,6,9 where repetition of digits is allowed

Ans: (144)

17. Let $\alpha, \beta \in R$ be such that the function $f(x) = \begin{cases} 2\alpha(x^2 - 2) + 2\beta x, & x < 1 \\ (\alpha + 3)x + (\alpha - \beta), & x \geq 1 \end{cases}$ be differentiable at all $x \in R$. Then $34(\alpha + \beta)$ is equal to

(1) 24 (2) 84 (3) 48 (4) 36

Ans: (3)

18. Let $A(1,0)$, $B(2, -1)$ and $C\left(\frac{7}{3}, \frac{4}{3}\right)$ be three points. If the equation of bisector of the angle ABC is $\alpha x + \beta y = 5$. Then the value of $\alpha^2 + \beta^2$ is

(1) 8 (2) 5 (3) 10 (4) 13

Ans: (3)
