



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: 28th January 2026 | Shift 2

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.

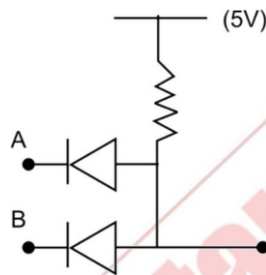


JEE Main – 28th January – 2026 (Shift-2)

[Memory-Based Questions]

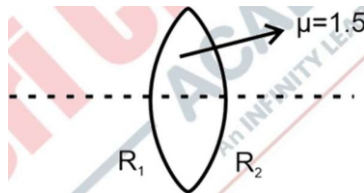
PHYSICS

1. For the circuit given below, identify the logic gate.



Ans: (AND)

2. Object is placed at a distance of 30 cm from the lens given below. The distance of image from lens is ($R_1 = 10$ cm, $R_2 = 20$ cm)



Ans: (24 cm)

3. A block of mass m is placed on a smooth inclined plane making an angle θ with the horizontal. The inclined plane itself is accelerating horizontally with a constant acceleration A_0 . Find the time taken by the block to reach the bottom of the incline. (length of inclined plane = l)

(1) $\sqrt{\frac{2l}{A_0 \cos \theta + g \sin \theta}}$

(2) $\sqrt{\frac{2l}{A_0 \sin \theta + g \cos \theta}}$

(3) $\sqrt{\frac{2l}{(A_0 + g) \sin \theta}}$

(4) $\sqrt{\frac{2l}{g \sin \theta}}$

Ans: (1)



4. Consider the following electromagnetic waves:

Wavelength of $A = 400 \text{ nm}$

Frequency of $B = 10^{16} \text{ sec}^{-1}$

Wave number of $C = 10^4 \text{ cm}^{-1}$

Order of energies is:

(1) $A > B > C$ (2) $B > A > C$ (3) $B > C > A$ (4) $C > A > B$

Ans: (2)

5. If position vector is given as $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ and if its signs are reversed then which of the following physical quantity remains unaffected?

(1) Acceleration

(2) velocity

(3) Linear Momentum

(4) Angular Momentum

Ans: (4)

6. Which of following physical quantity is not measurable?

1) Displacement Current

2) Voltage difference

3) Acceleration

4) Voltage

Ans: (4)

7. Measurement taken with Vernier Caliper are as follows

1.21 mm, 1.23 mm, 1.24 mm, 1.25 mm what can be least count?

1) 0.1 mm

2) 0.01 mm

3) 0.001 mm

4) 0.0001 mm

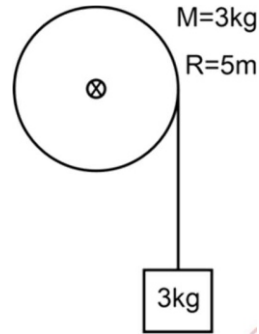
Ans: (2)

8. Two light sources A and B of 650 nm and 550 nm are used for YDSE with slit distance 2.25 mm and the distance between the slits and screen is 1.5 m. The m^{th} order maxima of A coincides with the n^{th} order maxima of B. Find the value of m

Ans: (11)



9. Find the kinetic energy of disc when the block has fallen by **3 m**.



Ans: (30 J)

10. A beam of power $2 \mu\text{W}$ is hitting a metal surface. The beam contains photons of wavelength 662 nm . Find the number of photons striking per second.

(1) $\times 10^{14}$ (2) 6.67×10^{12} (3) 4×10^{11} (4) 3.2×10^{13}

Ans: (2)

11. If δ_{\min} by a prism is equal to the refracting angle then choose the range of μ of the prism.

(1) $1 < \mu < \sqrt{2}$ (2) $1 < \mu < 2$ (3) $1 < \mu < 2\sqrt{2}$ (4) $1 < \mu < \sqrt{3}$

Ans: (2)

12. Mean free path of gas particles of diameter 5\AA at temperature and pressure of 41°C and $1.38 \times 10^5 \text{ Pa}$ is.

(1) 14.14 nm (2) 20 nm (3) 28.28 nm (4) 10 nm

Ans: (3)

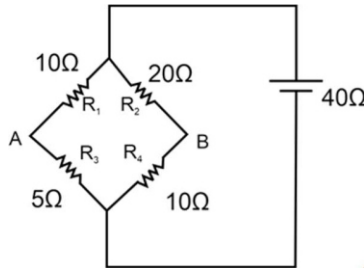
13. If the mass number of nucleus is α , its radius is R_α . For another nucleus mass number is β and its radius is R_β , then $R_\alpha/R_\beta = ?$ [Given $\beta = 8\alpha$]

(1) 1 (2) $1/2$ (3) $1/3$ (4) 2

Ans: (2)



14. In the given circuit, because of heating R_3 , R_3 increases by 20%. Then potential difference across A and B becomes ____



- (1) 1.50 V (2) 2.40 V (3) 1.67 V (4) 3.60 V

Ans: (3)

15. Match the two columns and choose the correct option.

	Column-I		Column-II
(a)	Coefficient of viscosity	(p)	$[ML^0 T^{-2}]$
(b)	Surface tension	(q)	$[ML^{-1} T^{-2}]$
(c)	Pressure	(r)	$[ML^2 T^{-2}]$
(d)	Work	(s)	$[ML^{-1} T^{-1}]$

- (1) (a)-(p), (b)-(q), (c)-(r), (d)-(s) (2) (a)-(s), (b)-(p), (c)-(q), (d)-(r)
(3) (a)-(q), (b)-(s), (c)-(p), (d)-(r) (4) (a)-(p), (b)-(q), (c)-(s), (d)-(r)

Ans: (2)

16. Two tuning forks A & B produce 8 beats in 2 seconds. When 'A' is waxed, the number of beats becomes 4 in 2 seconds, Find frequency of 'A' if frequency of 'B' is 380 Hz ?

- (1) 376 Hz (2) 384 Hz (3) 380 Hz (4) None

Ans: (2)



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17. Find the percentage error in K , where $T = 2\pi \sqrt{\frac{m}{K}}$. Given that 60 oscillations are completed in 50 second. Given time resolution is 2 second, $m = 10$ g and $\Delta m = \pm 10$ mg.

Ans: (8.1%)



CHEMISTRY

1. The total number of compounds react with Heinsberg reagent and are insoluble in KOH ?
- (A) N - Methyl Aniline
(B) N - Phenyl Aniline
(C) N, N-Dimethyl Aniline
(D) Aniline
(E) Methanamine
(F) N - methyl Ethanamine

Ans: (3)

2. Match the Iso-structural species

	Column-I		Column-II
(a)	XeO_3	(p)	BrF_5
(b)	XeF_2	(q)	NH_3
(c)	XeO_2F_2	(r)	I_3^-
(d)	XeOF_4	(s)	SF_4

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

(2) $a - p, b - q, c - s, d - p$

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

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

Ans: (1)



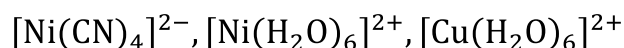
3. The NO_2 (Nitro) group attached to a Benzene ring is:
- (1) An activating group for the ring towards electrophilic substitution reactions.
 - (2) A deactivating group for the ring towards nucleophilic substitution reactions.
 - (3) An activating group for the ring towards nucleophilic substitution reactions.
 - (4) A deactivating group for the ring towards electrophilic substitution reactions.

Ans: (4)

4. Consider the following Electromagnetic waves Wavelength of A = 400 nm
Frequency of B = 10^{16}sec^{-1} Wave number of C = 10^4cm^{-1} Order of Energies of A, B, C respectively are
- (1) $A > B > C$ (2) $B > A > C$ (3) $B > C > A$ (4) $C > A > B$

Ans: (2)

5. The Magnetic moment of the following complexes follows which of the given orders?



- (1) $[\text{Cu}(\text{H}_2\text{O})_6]^{2+} > [\text{Ni}(\text{H}_2\text{O})_6]^{2+} > [\text{Ni}(\text{CN})_4]^{2-}$
- (2) $[\text{Ni}(\text{H}_2\text{O})_6]^{2+} > [\text{Cu}(\text{H}_2\text{O})_6]^{2+} > [\text{Ni}(\text{CN})_4]^{2-}$
- (3) $[\text{Ni}(\text{CN})_4]^{2-} > [\text{Ni}(\text{H}_2\text{O})_6]^{2+} > [\text{Cu}(\text{H}_2\text{O})_6]^{2+}$
- (4) $[\text{Cu}(\text{H}_2\text{O})_6]^{2+} > [\text{Ni}(\text{CN})_4]^{2-} > [\text{Ni}(\text{H}_2\text{O})_6]^{2+}$

Ans: (2)



6. The sum of valence electrons in element with most and least metallic character among the following is : ___ Na, P, Cl, S, O and F

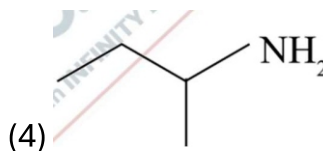
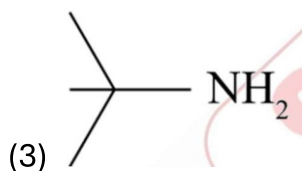
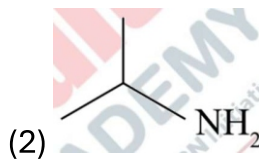
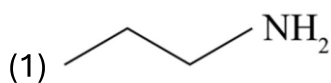
Ans: (8)

7. In the estimation of Sulphur, 0.314 g of Organic compound gives **0.4813 g** of Barium sulphate. What is the percentage of Sulphur in the Organic compound? (Report to nearest integer).

Ans: (21)

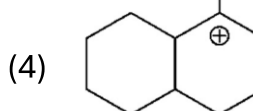
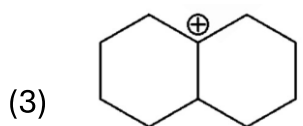
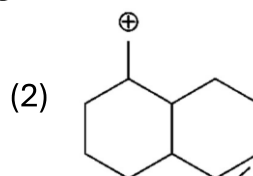
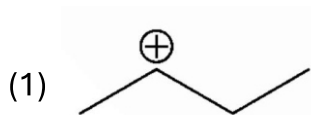
8. (X) $\xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) NaNO}_2/\text{HCl}}$ $\xrightarrow[\text{I}_2]{\text{NaOH}}$ (Y) + Yellow ppt

The percentage of Carbon in X is 61.00, H-15.25 and N-23.75. Find X



Ans: (2)

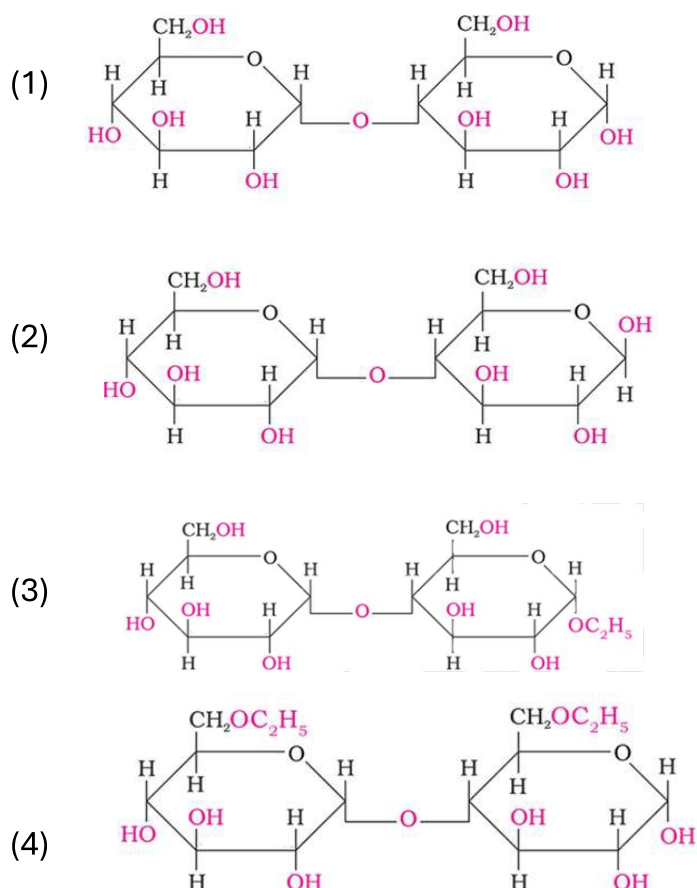
9. Which pair have same Hyper-conjugation?



Ans: (1,3,4)

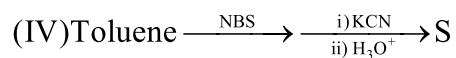
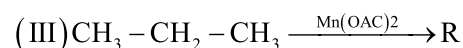
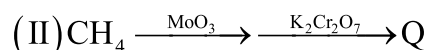
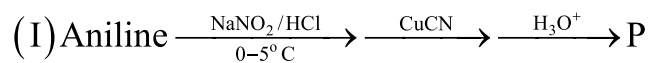


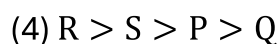
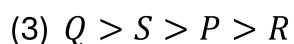
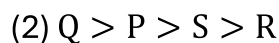
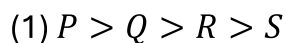
10. Which of the following carbohydrate is Non-reducing?



Ans: (3)

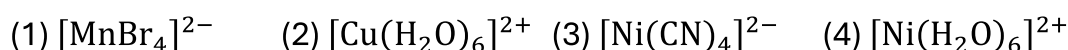
11. Find the correct order of Acidic strength in the following reaction products P, Q, R and S :





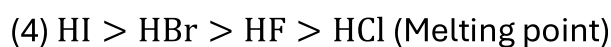
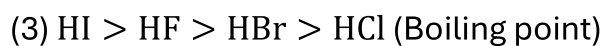
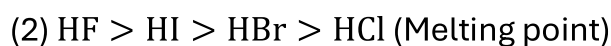
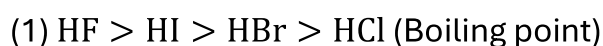
Ans: (2)

12. Diamagnetic species among the following complexes is



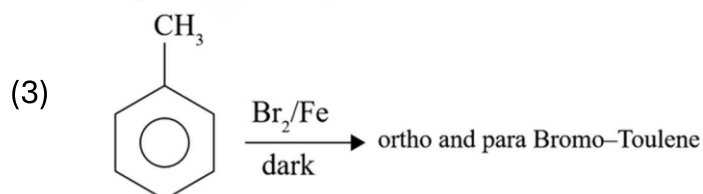
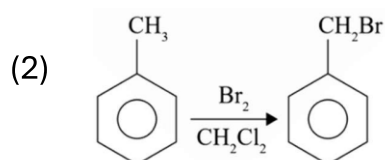
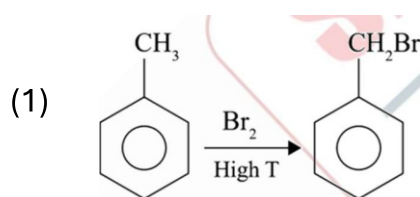
Ans: (3)

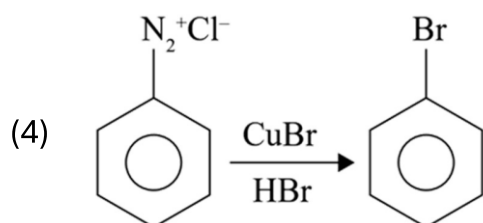
13. Which of the following order is Correct?



Ans: (1)

14. Which of the following reactions is incorrectly shown against the major product?





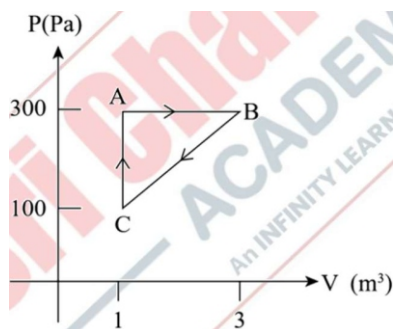
Ans: (2)

15. Which of the following ionic compounds has the maximum ionic character?

- (1) LiCl (2) NaCl (3) KCl (4) CsCl

Ans: (4)

16. A sample of an ideal gas undergoes a cyclic process as shown in the P-V diagram below.



Calculate the net work done by the gas (in joule).

Ans: (200 J)



MATHEMATICS

- The sum of the coefficients of x^{499} and x^{500} in the binomial expansion $(1+x)^{1000} + (1+x)^{999}(x) + x^2(1+x)^{998} + \dots + x^{1000}$ is
Ans: $(C(1002, 500))$
- If $\sum_{r=1}^{25} \frac{r}{r^4+r^2+1} = \frac{p}{q}$, where p and q are co-prime positive integers, then $p+q$ is equal to
Ans: (976)
- $\frac{6}{3^{26}} + \frac{10}{3^{25}} + \frac{10.2}{3^{24}} + \frac{10.2^2}{3^{23}} + \dots + \frac{10.2^{24}}{3}$ is equal to
Ans: (2^{26})
- The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{12(3+[x])}{3+[\sin x]+[\cos x]} dx$ is equal to
Ans: $(11\pi + 2)$
- If $A = \{z \in \mathbb{C} \mid |z-2| \leq 4\}$, $B = \{z \in \mathbb{C} \mid |z+2| + |z-2| = 5\}$. Then find $|z_1 - z_2|$ if $\{z_1 \in A, z_2 \in B\} =$
Ans: (0)
- Let $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$ and B be a 2×2 matrix such that $A^{100} = 100B + I$, then sum of all elements of B^{100} is
Ans: (Null matrix)
- Let a triangle ABC such that $A \equiv (0,0)$ and vertices B and C lie on the parabola $y^2 = 8x$ such that $(\frac{7}{3}, \frac{4}{3})$ is the centroid of the $\triangle ABC$ then $(BC)^2$ is equal to
Ans: (120)



8. By the principle of inverse trigonometric functions, the value of \tan

$$\left(2\sin^{-1}\left(\frac{2}{\sqrt{13}}\right) - 2\cos^{-1}\left(\frac{3}{\sqrt{10}}\right)\right)$$
 is equal to

Ans: (33/56)

9. If the arithmetic mean of $\frac{1}{a}$ and $\frac{1}{b}$ is $\frac{5}{16}$ and $a, 4, \alpha, b$ are in increasing A.P. then both the roots of the equation $\alpha x^2 - ax + 2(\alpha - 2b) = 0$ are

Ans: (2, -5/3)

10. Statement I: $25^{13} + 20^{13} + 8^{13} + 3^{13}$ is divisible by 7.

Statement II: The integral value of $(7 + 4\sqrt{3})^{25}$ is an odd number

(1) Only statement I is correct (2) Only statement II is correct

(3) Neither statements are correct (4) Both statements are correct

Ans: (4)

11. The range of

$$f(x) = \operatorname{sgn}(\sin x) + \operatorname{sgn}(\cos x) + \operatorname{sgn}(\tan x) + \operatorname{sgn}(\cot x), x \neq \frac{n\pi}{2}, n \in I,$$

$$\text{where } \operatorname{sgn}(t) = \begin{cases} 1, & t > 0 \\ -1, & t < 0 \\ 0, & t = 0 \end{cases}$$

(1) $\{4, -4, 2, -2\}$ (2) $\{-2, 0, 4\}$ (3) $\{4, -4, 0, -2\}$ (4) $\{2, -2, 0, 4, -4\}$

Ans: (2)

12. Let $y = y(x)$ be the solution of the differential equation

$$x \frac{dy}{dx} - y = x^2 \cot x, x \in (0, \pi). \text{ If } y\left(\frac{\pi}{2}\right) = \frac{\pi}{2}, \text{ then } 6y\left(\frac{\pi}{6}\right) - 8y\left(\frac{\pi}{4}\right) \text{ is}$$

Ans: $(-\pi)$

13. **Statement I:** The function F defined from $R \rightarrow R, F(x) = \frac{x}{1+|x|}$ is one-one

Statement II: The function F defined from $R \rightarrow R, F(x) = \frac{x^2+4x-3}{x^2-8x+18}$ is many-



one

- (1) Statement I is correct but statement II is not correct
- (2) Statement I and statement II both are correct
- (3) Statement I is incorrect but statement II is correct
- (4) Both statement are incorrect

Ans: (1)

14. Let $f(x) = \lim_{\theta \rightarrow 0} \frac{\cos \pi x - x^{\frac{2}{\theta}} \sin(x-1)}{1+x^{2/\theta} \cdot \sin(x-1)}$, ($x \in R$) then which of the following is correct

- (1) f is continuous at $x = 1$, $f(1) = -1$
- (2) f is discontinuous at $x = -1$, $f(1) = -1$
- (3) f is continuous at $x = 1$, $f(1) = 1$
- (4) f is discontinuous at $x = 1$, $f(1) = 1$

Ans: (1)

15. Consider the data:

$x:$	$4k$	$\frac{30}{7}k$	$\frac{32}{7}k$	$\frac{34}{7}k$	$\frac{36}{7}k$	$\frac{38}{7}k$	$\frac{40}{7}k$	$6k$
$p(x):$	$\frac{2}{15}$	$\frac{1}{15}$	$\frac{2}{15}$	$\frac{1}{5}$	$\frac{1}{15}$	$\frac{2}{15}$	$\frac{1}{5}$	$\frac{1}{15}$

If $E(x) = \frac{263}{15}$, then $P(x < 20)$ is equal to

Ans: $(\frac{11}{15})$
