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JEE MAINS 2026

MEMORY BASED QUESTIONS AND SOLUTIONS

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NEET 2023

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Memory Based Questions and Answers

JEE MAIN 2026

SESSION 2

Test Date: 04th April 2026 | Shift 1

Instructions

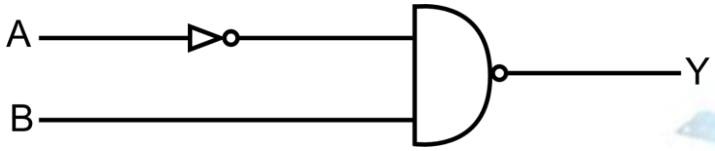
- The test is of **3 hours** duration.
- This test paper consists of 75 questions. Each subject (PCM) has 25 questions. The maximum marks are 300.
- This question paper contains Three Parts. Part-A is Physics, Part-B is Chemistry and Part-C is Mathematics. Each part has only two sections: Section-A and 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 – 04nd April – 2026 (Shift-1)

[Memory-Based Questions]

PHYSICS

1. Two 4 bits binary numbers A = 1101 and B = 1010 are given in the in puts logic circuit shown in the figure. Find the output Y.



(1) 1000 (2) 1101 (3) 0010 (4) 0111

Ans: (2)

2. A slit of width **a** is illuminated by light of wave length λ. The linear separation between 1^{st} and 3^{rd} minima in the diffraction pattern produced on a screen placed at a distance D from the slit is ___ .

(1) 3D λ (2) D λ (3) 1.5D λ (4) 2D λ /*a*

Ans: (4)

3. In a screw gauge when the circular scale is given five complete rotations it moves linearly by 2.5 mm. If the circular scale has 100 divisions, the least count of screw gauge is ___ mm.

(1) 1×10^{-2} (2) 5×10^{-3} (3) 1×10^{-3} (4) 5×10^{-2}

Ans: (2)

4. The surface tension of a soap solution is 3.5×10^{-2}N/m. The energy required to increase the radius of a soap bubble from 1cm to 2cm is a x 10^{-6}J. Value of a is____.

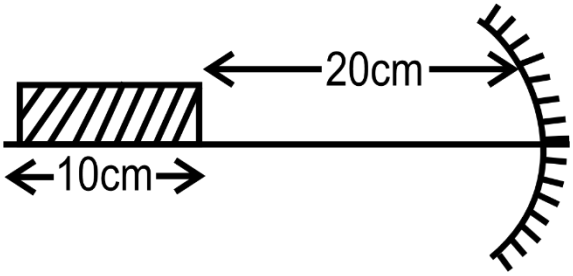
Ans: 264

5. The increase in the pressure required to decrease the volume $(\triangle V)$ of water is $6.3 \times 10^7\ \mathrm{N/m^2}$. The percentage decrease in the volume is ___ %.

(Bulk modules of water $= 2.1 \times 10^9\ \mathrm{N/m^2}$)

Ans: 3

6. A rod of length 10cm lies along the principal axis of a concave mirror of focal length 10cm as shown in the figure. The length of the image is _____cm



Ans: 5

7. A body of mass $60g$ is moving with a velocity $\vec{v} = 2t\hat{i} + 6t^2\hat{j}$ along the x-axis and y-axis respectively. Find the power at $t = 2sec$

(1) 35.04 W (2) 30W (3) 20W (4) 2520W

Ans: (1)

8. Find the coefficient of friction μ if time taken by the block in rough surface is 50% more than time taken in the smooth surface. The distance slid by the mass is same in both the cases.

(1) $\mu = 4/9$ (2) $\mu = 4/7$ (3) $\mu = 5/9$ (4) $\mu = 5/7$

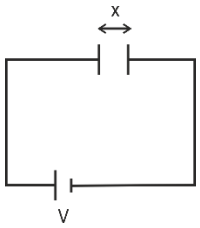
Ans: (3)

9. Nuclei A and B form a nucleus C. If BE/N for A, B and C are 3 MeV, 7 MeV and 6 MeV. Then energy produced in $2\ A^3 + B^4 \rightarrow C^{10}$

(1) 14 Mev (2) 12 Mev (3) 10 Mev (4) 8 Mev

Ans: (1)

10. If x is increased at a constant rate then rate of change of energy stored is proportional to x^{α}. Find α



Ans: -2

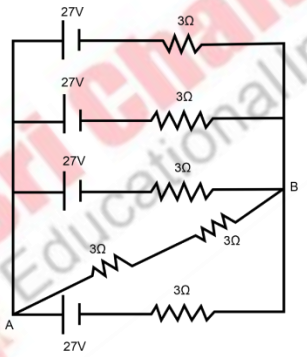
11. An inductance of 10 mH, capacitance 0.1μ F and resistance 100Ω are connected series. The power factor of the circuit is 0.5. Find the difference between the inductive reactance and the capacitive reactance is $\sqrt{3}\alpha$. Find α

Ans: 100

12. Two projectiles are projected with the same initial velocities at 15^{o} and 30^{o} angles with respect to the horizontal. The ratio of the range is ratio 1: X. The value of X is

Ans: $\sqrt{3}$

13. The voltage and the current between points A and B so in the circuit are_____.



Ans: 24V, 4A

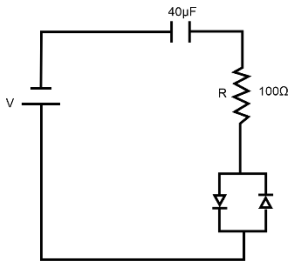
14. Let a solid sphere(R) of mass M Is cut into inequal parts with which a sphere is formed with mass M/8 and radius r and other part is made into a disc of radius 2R then ratio of moment of inertia of the disc (diameter) to the sphere (through center) is _____.

Ans: 70

15. An insulated wire is wound so that it forms a coil with N = 200 turns. The radius of the innermost turn is r_1 = 3cm and the outermost r_2 = 6 cm. If 20mA current flows in the wire, the magnetic moment will be *a* x $10^{-3}Am^2$. The value of a is.

Ans: 26

16. If the forward resistance of the diode is 10Ω. Find the time constant in given RC circuit

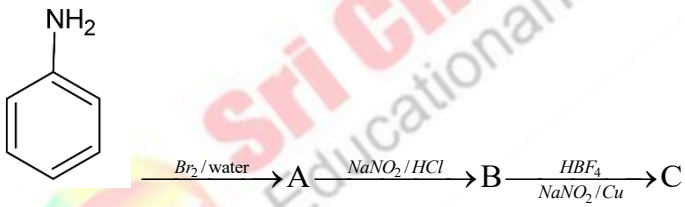


Ans: 44 x 10^{-4}

17. A telescope with objective diameter R is used to observe a distinct emitting light of wavelength 500nm. If the resolution of 5 x 10^{-7} rad the value of R is

Ans: $84\pi \times 10^{-4}$

CHEMISTRY

1. 

What is the final product of C is

(1) 4-Bromo-1-Nitrobenzene

(2) 1,3,5-Tribromo-2-Nitrobenzene

(3) 1,3,5-Tribromobenzene

(4) 1-Bromo-4-nitrobenzene

Ans: (2)

2. 500 mL of $0.1M\ NH_4OH$ mixed with 200 mL of 0.1 M NH_4Cl, the pH of the solution. The P^{kb} of NH_4OH is 4.74

Ans: 9.66

3. Match the Column-I with Column-II.

Column - I Named Reaction		Column - II Reagent used	
A.	Sandmeyer	p.	NaI/ Acetone
B.	Fittig	q.	Cu_2Cl_2
C.	Finkelstein	r.	Na/ dry ether
D.	Swarts	s.	SbF_5

(1) A-q, B-r, C-p, D-s (2) A-p, B-r, C-q, D-s

(3) A-r, B-q, C-p, D-s (4) A-q, B-r, C-s, D-p

Ans: (1)

4. The ratio of wave number of 1^{st} line of Balmer series to the 1^{st} line of Brackett series of hydrogen atom is

(1) 5:27 (2) 5:0.81 (3) 5:1.75 (4) 5:1

Ans: (2)

5. In XeO_6^{4-} the sum of the number of σ bonds and lone pair of electrons on the central atom ___.

Ans: 6

6. **Statement-I:** The covalency of Oxygen in general is 2 and the oxidation state of oxygen +2 in OF_2

Statement-II: The anomalous behaviour of Oxygen in its group is due to its small size and high electronegativity

(1) Both Statement I and Statement II are correct.
(2) Both Statement I and Statement II are incorrect.
(3) Statement I is correct but Statement II is incorrect.
(4) Statement 1 is incorrect but Statement II is correct.

Ans: (1)

7. In order to oxidise a mixture of 1 mole of each FeC_2O_4; $Fe_2(C_2O_4)_3$; $Fe_2(SO_4)_3$, in acidic medium, the number of moles of $KMnO_4$ required.

(1) 7 (2) 3 (3) 2 (4) 5

Ans: (3)

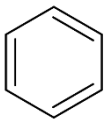
8. A monoatomic anion (A^-). has 45 neutrons & 36 electrons. Atomic mass, position of element in the periodic table and physical state at room temperature is

(1) 81,15, gas (2) 80,16, gas (3) 80, 17, liquid (4) 80,15, liquid

Ans: (3)

9. In the following the number of paramagnetic molecules are: O_2, N_2, F_2, B_2, Cl_2

Ans: 1

10. 

$\xrightarrow[3)\ K_2Cr_2O_7/H^+]{1)\ CH_3Cl/AlCl_3,\ 2)\ Cl_2/AlCl_3}$ Product (x)

If ' p ' gram of ' x ' react with $NaHCO_3$ then $11.2dm^3$ of gas obtained at STP. Calculate the value of ' P '

Ans: 78.25

11. **Statement-I :** Maltose is a reducing sugar

Statement-II : Lactose is a non- reducing sugar

(1) Both Statement I and Statement II are correct.
(2) Both Statement I and Statement II are incorrect.
(3) Statement I is correct but Statement II is incorrect.
(4) Statement 1 is incorrect but Statement II is correct.

Ans: (3)

12. Among the following Complexes, which complex having CFSE equals to zero and magnetic moment 5.92 BM.

(1) $[Fe(CN)_6]^{-4}$ (2) $[FeF_6]^{-4}$ (3) $[Co(NH_3)_6]^{+3}$ (4) $[Mn(SCN)_6]^{-4}$

Ans: (4)

13. Number of moles and number of molecules in 1.4187 L of SO_2 at STP respectively are

(1) 0.1266 and 7.6238×10^{22}
(2) 0.0633 and 7.6238×10^{22}
(3) 0.1260 and 3.812×10^{22}
(4) 0.0633 and 3.812×10^{22}

Ans: (4)

14. Increasing order of electron with drawing power of the following functional group is

$a - CN$
$b - COOH$
$c - NO_2$
$d - I$

(1) $a < b < c < d$
(2) $c < a < b < d$
(3) $d < b < a < c$
(4) $c < b < d < a$

Ans: (3)

15. Which of the following is correct set of quantum numbers of 19^{th} electron of Chromium (Atomic number 24). In accordance with Aufbau principle

(1) $n = 4, l = 1; m = 0; s = +\frac{1}{2}$
(2) $n = 4; l = 0; m = 0; s = +\frac{1}{2}$
(3) $n = 3; l = 2; m = +2; s = +\frac{1}{2}$
(4) $n = 3; l = 2; m = -2; s = +\frac{1}{2}$

Ans: (2)

16. Consider the two products

$CH_3 - CH_2 - CH_2 - \overset{O}{\overset{\|}{C}} - H$ and $CH_3 - CH = CH - \overset{O}{\overset{\|}{C}} - H$
(A) (B)

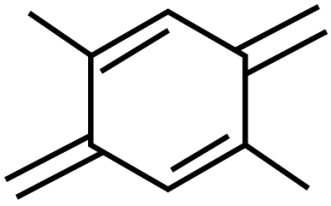
The correct order of the dipole moment and C-O bond length will be

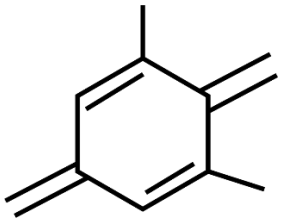
(1) A > B: A>B
(2) A < B: A<B
(3) A > B: A<B
(4) A < B: A>B

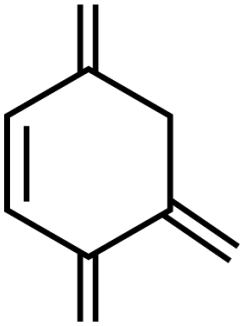
Ans: (2)

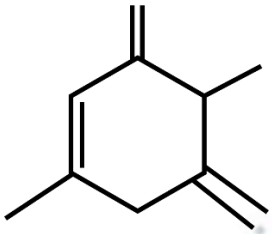
17. An alkene (x) on ozonolysis followed by reduction gave the following products

The alkene is (x) is

(1) 

(2) 

(3) 

(4) 

Ans: (1)

18. In the following sequence of the reaction. A is converted to D.

$$\text{A } C_3H_6O \xrightarrow{H_2/pd} B \xrightarrow{HBr} C \xrightarrow{Mg/\text{ ether}} D$$

D is treated with A followed by hydrolysis to give 2,3-Dimethyl-butan-2-ol. Then identify A, B, C in the reaction

(1) $A = CH_3COCH_3, B = CH_3 - CH(OH)CH_3, C = CH_3 - CH(Br)CH_3$
(2) $A = CH_3CH_2CHO, B = CH_3 - CH(OH)CH_3, C = CH_3 - CH(Br)CH_3$
(3) $A = CH_3COCH_3, B = CH_3 - CH(Br)CH_3, C = CH_3 - CH(OH)CH_3$
(4) $A = CH_3CH_2CHO, B = CH_3 - CH(Br)CH_3, C = CH_3 - CH(OH)CH_3$

Ans: (1)

19. The activation energy of forward & backward reactions is $100\ kJ/mole$ and $180\ kJ/$ mole respectively. Find the correct statement if catalyst is added under same temperature and pressure.

(1) Catalyst doesn't change ΔG of reaction.
(2) Catalyst make non-spontaneous reaction to spontaneous.
(3) Catalyst changes ΔH of reaction
(4) Enthalpy reaction (ΔH) is $80\ kJ/$ mole

Ans: (4)

20. Statement I: Boiling point order $HI < HBr < HCl < HF$
Statement II: Melting point order $HI < HF < HCl < HBr$

(1) Both Statement I and Statement II are correct.
(2) Both Statement I and Statement II are incorrect.
(3) Statement I is correct but Statement II is incorrect.
(4) Statement 1 is incorrect but Statement II is correct.

Ans: (2)

21. Match the Column-I with Column-II.

Column - I (Amino acid)		**Column - II** (One letter symbol)	
A.	Glutamic acid	p.	E
B.	Lysine	q.	K
C.	Arginine	r.	R
D.	Alanine	s.	A

(1) A-P, B-Q, C-R, D-S

(2) A-S, B-Q, C-R, D-P

(3) A-Q, B-P, C-S, D-R

(4) A-P, B-S, C-R, D-Q

Ans: (1)

22. Consider the first order reaction $R \rightarrow P$; the fraction of molecules decomposed in the given order reaction can be expressed as

(1) $1 - e^{-k_1 t}$ (2) $1 + e^{-k_1 t}$

(3) $1 + e^{+k_1 t}$ (4) $1 - e^{+k_1 t}$

Ans: (1)

MATHEMATICS

1. If $|z+2| = |z-2|$ and $\text{Arg}\left|\frac{z-3}{z+i}\right| = \frac{\pi}{4}$ then $|z|^2$ is

   Ans: 9

2. If 4 boys and 3 girls are arranged in queue, then number of arrangements such that all girls do not sit together

   Ans: 4320

3. A line with direction ratios $1, -1, 2$ intersects the lines $\frac{x}{2} = \frac{y}{3} = \frac{z+1}{3}$ and $\frac{x+1}{-1} = \frac{y-2}{1} = \frac{z}{4}$ at the points P and Q respectively. If the length of the line segment PQ is α, then $225\alpha^2$ is equal to

   (1) 1104 (2) 1204 (3) 1024 (4) 1014

   Ans: (4)

4. The number of functions $f: \{1,2,3,4\} \to \{a, b, c\}$ which are not onto is.

   (1) 45 (2) 51 (3) 35 (4) 48

   Ans: (1)

5. If $y = \tan^{-1}\left(\frac{3\cos x - 4\sin x}{4\cos x + 3\sin x}\right) + 2\tan^{-1}\left(\frac{x}{1+\sqrt{1-x^2}}\right)$ then $\frac{dy}{dx}$ at $x = \frac{\sqrt{3}}{2}$

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

   Ans: (2)

6. In an AP, if $a_1 = \frac{10}{3}, S_{30} = (a_{30})^3$ then d is equal to

   Ans: $\frac{5}{87}$

7. The square of the distance of the Point $(-2, -8, 6)$ from the line $\frac{x-1}{1} = \frac{y-1}{2} = \frac{z}{-1}$ along the line $\frac{x+5}{1} = \frac{y+5}{-1} = \frac{z}{2}$ is equal to:

   (1) 3 (2) 8 (3) 12 (4) 6

   Ans: (4)

8. let $A = \begin{bmatrix} 1 & 1 & 2 \\ -2 & 0 & 1 \\ 1 & 3 & 5 \end{bmatrix}$. Then the sum of all elements of matrix $\text{adj}\left(\text{adj}\left(2(\text{adj}A)^{-1}\right)\right)$ is equal to:

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

Ans: (1)

9. Let $S=\left\{A=\begin{bmatrix}a & b\\ c & d\end{bmatrix}; a,b,c,d \in \{0,1,2,3,4\} \text{ and } A^2-4A+3I=0\right\}$ be a set of 2×2 Matrices. Then the number of matrices in S, for which the sum of the diagonal elements equal to 4 is

(1) 20 (2) 19 (3) 17 (4) 21

Ans: (2)

10. Let [•] denote the greatest integer function. If the domain of the function $f(x)=\cos^{-1}\left(\frac{4x+2[x]}{3}\right)$ is (α,β) then $12(\alpha+\beta)$ is equal to

(1) 4 (2) 9 (3) 6 (4) 8

Ans: (3)

11. Let f be a real polynomial of degree n such that $f(x)=f'(x)f''(x), \forall x \in \mathbb{R}$. If $f(0)=0$ then $36\left[f'(2)+f''(2)+\int_0^2 f(x)dx\right]$ is equal to

(1) 56 (2) 66 (3) 46 (4) 42

Ans: (1)

12. Suppose that two chords drawn from the point $(1,2)$ on the circle $x^2+y^2+x-3y=0$ are bisected by the y-axis. If the order ends of these chords are R and S, and the mid point of the line segment is (α,β) then $6(\alpha+\beta)$ is equal to

(1) 3 (2) 6 (3) 1 (4) 4

Ans: (1)

13. Let the vertex A of a triangle ABC be $(1,2)$ and the midpoint of the side AB be $(5,-1)$. If the centroid of this triangle is $(3,4)$ and circumcenter is (α,β) then $21(\alpha+\beta)$ is equal to

(1) 309 (2) 524 (3) 497 (4) 403

Ans: (3)

14. The area of the region $\{(x,y): y \leqslant \pi-|x|, y \leqslant |x\sin x|, y \geq 0\}$ is

Ans: $2+\frac{\pi^2}{4}$

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DETAILED PAPER SOLUTIONS

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