



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: 24<sup>th</sup> 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 – 24<sup>th</sup> January – 2026 (Shift-2)

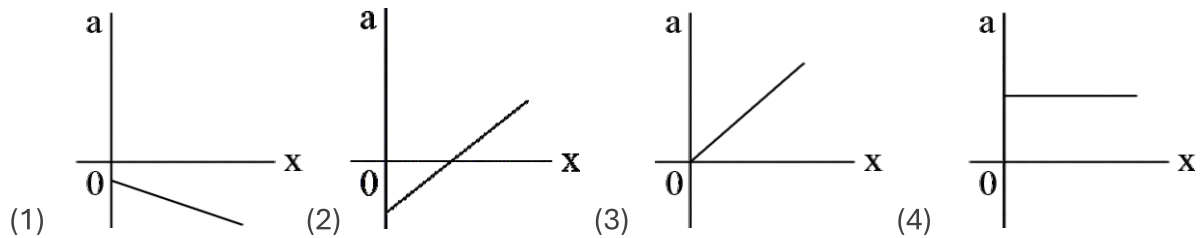
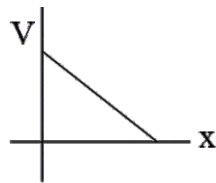
### [Memory-Based Questions]

### PHYSICS

1. An object of density  $\rho_1 = 600 \text{ kg/m}^3$  is floating in a liquid of density  $\rho_2 = 900 \text{ kg/m}^3$ . If the height of object,  $H = 10 \text{ cm}$ , then the height of object immersed in liquid is

Ans: (6.7 cm)

2. The velocity ( $v$ )-distance ( $x$ ) graph is shown in the figure, then the graph for acceleration( $a$ )-distance( $x$ ) for this system is.



Ans: (2)

3. The distance between the object and a three times magnified real image is 40 cm. Then the focal length of the mirror is

- (1) -10                      (2) -15                      (3) -20                      (4) -15/2

Ans: (2)

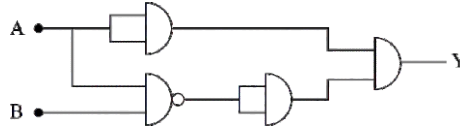
4. A point source is kept at the centre of the spherically enclosed detector. If the volume of the detector increases by 8 times, then intensity will \_\_\_\_\_ .

- (1) increase by 8 times                      (2) increase by 64 times  
(3) decrease by 8 times                      (4) decrease by 4 times

Ans: (4)



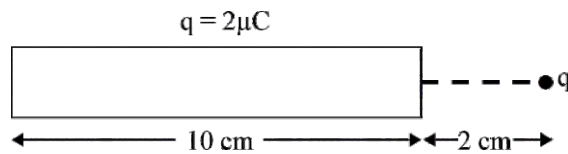
5. What will be the correct truth table for the given logic gates system?



Ans:

A	B	Y
0	0	0
1	0	1
0	1	0
1	1	0

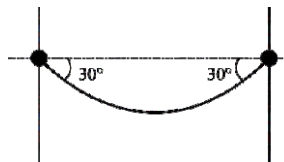
6. Find the value of force on charge  $q = 1 \mu\text{C}$  due to the uniformly charged rod



- (1) 7.5 N                      (2) 12 N                      (3) 6 N                      (4) 18 N

Ans: (1)

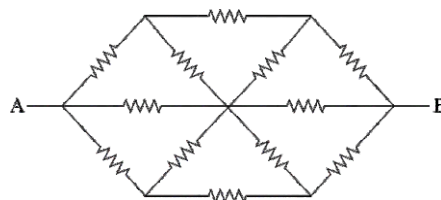
7. A uniform rope is supported by two level pin support as shown in the figure. Mass of the rope is  $m$ . Find the tension at the mid-point is



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

Ans: (2)

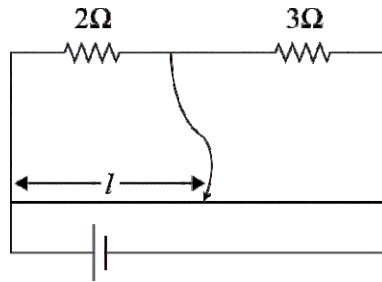
8. If the resistance of each side is  $R$ , find equivalent resistance between A and B



Ans:  $\left(\frac{4}{5} R\right)$

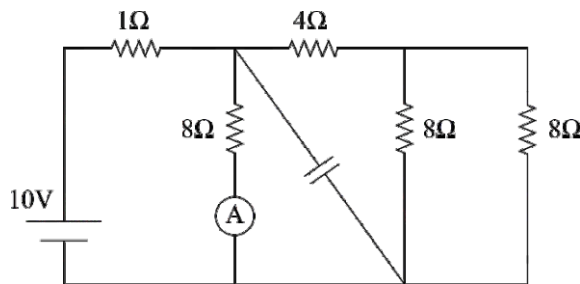


9. In case of a meter bridge, the balanced length for  $2\Omega$  and  $3\Omega$  is  $l$ . For  $x\Omega$  and  $3\Omega$  it is  $(l + 10\text{ cm})$ . Find value of  $x$



Ans: ( $3\Omega$ )

10. Find current through the ammeter in steady state



Ans: (1 A)

11. A gas filled in a closed cylinder at a pressure of  $3.23\text{ kPa}$  has temperature  $50^\circ\text{C}$ . The gas is heated to double its temperature. Then modified pressure is \_\_\_\_ .

Ans: ( $6.46\text{ kPa}$ )

12. The fifth harmonic of a closed organ pipe is found to be in unison with the first harmonic of an open organ pipe. The ratio of lengths of closed pipe to that of the open pipe is  $5/x$ . The value of  $x$  is

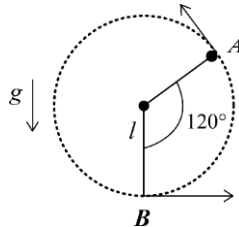
Ans: (2)

13. In a vernier calipers, 50 vernier scale divisions are equal to 48 main scale divisions. If one main scale division =  $0.05\text{ mm}$ , then the least count of the vernier calipers is \_\_\_\_ mm.

Ans: ( $0.002$ )



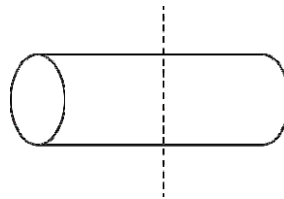
14. A particle attached to an ideal string is projected from position  $B$  (lowest position). At position  $A$ , tension in the string becomes zero. Find the speed in the string at  $B$ .



- (1)  $\sqrt{\frac{3gl}{2}}$       (2)  $\sqrt{2gl}$       (3)  $\sqrt{\frac{7gl}{2}}$       (4)  $\sqrt{5gl}$

Ans: (3)

15. For a uniform cylinder of length  $L$  and radius  $R$  the moment of inertia is  $I_1$ . Now for similar situation but length  $\frac{L}{2}$  and radius  $\frac{R}{2}$  moment of inertia is  $I_2$ . Find  $I_1/I_2$ .



- (1) 32      (2) 8      (3) 16      (4) 1/4

Ans: (1)

16. A moving coil galvanometer of resistance  $100\Omega$  shows a full scale deflection for a current of 1 mA. The value of resistance required to convert this galvanometer into an ammeter, showing full scale deflection for a current of 5 mA, is \_\_\_\_

Ans: (25  $\Omega$ )

17. Radius of a soap bubble is changed from 7 cm to 14 cm. Then work done in this process (in  $\mu\text{J}$ ) is  $15000 - x$ . Find the value of  $x$ . (Surface tension  $T = 0.04 \text{ N/m}^2$ )

Ans: (216)

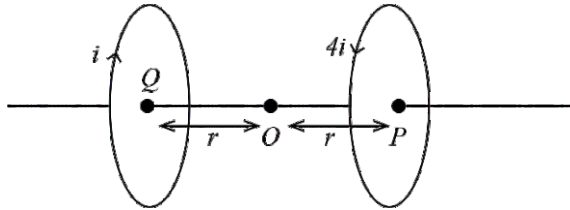
18. In YDSE slit separation  $d$  is 2 mm, distance between slit and screen  $D$  is 10 m, wavelength of wave  $\lambda = 6000\text{\AA}$ . If intensity of wave through each slit is  $I_0$ , Find intensity of fringe, in front of one of the slits

- (1)  $4I_0$       (2) zero      (3)  $I_0$       (4)  $2I_0$

Ans: (3)



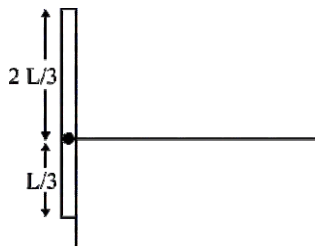
19. Two identical loops are placed coaxially as shown. Radius of both loops is  $r$ . Find magnetic field at O.



- (1)  $\frac{3\mu_0 i}{4\sqrt{2}r}$  towards P    (2)  $\frac{3gm_0 i}{4\sqrt{2}r}$  towards Q    (3)  $\frac{\mu_0 i}{4\sqrt{2}r}$  towards Q    (4)  $\frac{\mu_0 i}{4\sqrt{2}r}$  towards P

Ans: (1)

20. The rod is hinged at a distance  $\frac{L}{3}$  from the end. What is the angular velocity when the rod becomes horizontal.



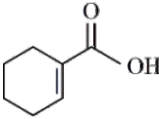
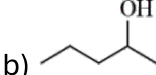
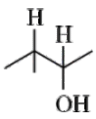
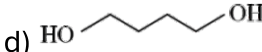
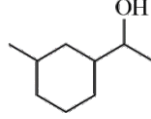
Ans:  $(\sqrt{\frac{3g}{L}})$

21. Heat supplied 300 J.  $C_p = \frac{7}{2}R$ . It is a Isochoric process. Temperature change from  $20^\circ\text{C}$  to  $50^\circ\text{C}$ . Find the number of moles of the gas ( $R = 8.314$ )

Ans: (0.48)

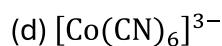
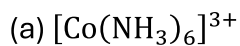


## CHEMISTRY

1. An electron make transition from higher energy orbit ( $n_2$ ) to lower energy orbit ( $n_1$ ) in  $\text{Li}^{2+}$  ion such that  $n_1 + n_2 = 4$  &  $n_2 - n_1 = 2$ . Determine the wavelength emitted in the dimension (in nm)  
(1) 12.9 nm                      (2) 11.4 nm                      (3) 16.7 nm                      (4) 9.2 nm  
Ans: (2)
2. 'X' is an oxo anion of the lightest element of Group-7 of d-Block. Which is the color of the potassium salt of element 'X' in it's highest oxidation state?  
(1) Orange                      (2) Yellow                      (3) Green                      (4) Purple  
Ans: (4)
3. Which is paramagnetic and has the same bond order?  
(1)  $\text{O}_2^+$ ,  $\text{N}_2^-$                       (2)  $\text{N}_2^-$ ,  $\text{O}_2^-$                       (3)  $\text{N}_2^+$ ,  $\text{O}_2^{2-}$                       (4)  $\text{N}_2^{2-}$ ,  $\text{O}_2$   
Ans: (1)
4. Choose the correct order of second Ionization Energy of O, C, N and F  
(1)  $\text{C} < \text{N} < \text{F} < \text{O}$                       (2)  $\text{C} < \text{F} < \text{O} < \text{N}$   
(3)  $\text{C} < \text{N} < \text{O} < \text{F}$                       (4)  $\text{C} < \text{O} < \text{F} < \text{N}$   
Ans: (1)
5. What is the number of tripeptide bonds formed when Alanine, Glycine and Valine are present where the same amino acid is not repeated in the tripeptide?  
(1) 8                      (2) 6                      (3) 4                      (4) 3  
Ans: (2)
6. Which of the following molecules is/are secondary alcohol?  
a)  b)  c)  d)  e)   
(1) b, c, d, e only                      (2) b, c, e only  
(3) a, c, d, e only                      (4) a, b, d only  
Ans: (2)



7. Order of wavelength of absorbed radiation for the below given complexes is,



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

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

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

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

Ans: (3)

8. Given :

$$\Delta H_{\text{atomization}}(\text{CH}_4) = x \text{ kJ mole}^{-1}$$

$$\Delta H_{\text{atomization}}(\text{C}_2\text{H}_6) = y \text{ kJ mole}^{-1}$$

Find out bond energy (C – C) (kJ/ mole).

(1)  $1y - x$

(2)  $y - 4x$

(3)  $y - \frac{3x}{2}$

(4)  $y - 2x$

Ans: (3)

9. For a radioactive element, if  $t_{1/2} = 245$  days. Find the time required(days) for 75% decay.

Ans: (490)

10. Given below are two statements.

**Statement I:** By using two different aldehydes, four different products are formed by self-aldol and cross-aldol condensation.

**Statement II:** An alkyl cyanide, after hydrolysis, gives a product which on heating with ammonia forms another product. This product on reaction with KBr gives product P, which on further reaction with chloroform in the presence of KOH produces R–NC.

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.

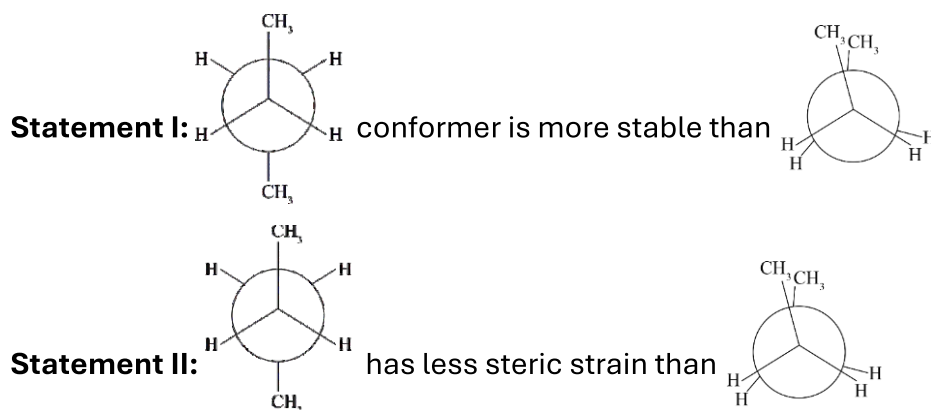
3) Statement-I is correct and statement-II is incorrect.

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

Ans: (1)



11. Given below are two statements.



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)

12. In the cation group analysis  $\text{Ca}^{2+}$  and  $\text{Ba}^{2+}$  are precipitated as

- (1) Sulphides      (2) Chlorides      (3) Hydroxides      (4) Carbonates

Ans: (4)

13. Given below are two statements.

**Statement I:**  $\text{RMgX}$  react with  $\text{CO}_2$  followed by acidification form product, which reacts with  $\text{NH}_3/\Delta$  then reacts with  $\text{NaOCl}$  form product which further reacts with  $\text{CHCl}_3/\text{NaOH}$  and final product is  $\text{R} - \text{N} \equiv \text{C}$ .

**Statement II:**  $\text{R} - \text{N} \equiv \text{C}$  on hydrolysis gives  $\text{RCOOH}$ .

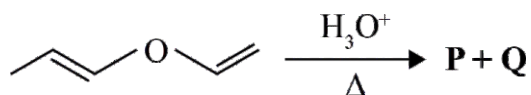
In the light of the above statements, which is the **correct** option.

- 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: (3)



14. How would you distinguish between product formed 'P' and 'Q' of reaction given below,



- (1) Fehling solution test (2) Tollens test  
(3) 2, 4-DNP test (4) Iodoform test

Ans: (4)

15. Vapor pressures of two volatile species A and B are 55 mm and 120 mm respectively. If mole fraction of 'A' in liquid state is 0.8, then mole fraction of 'B' in vapor state is

Ans: (0.35)

16. Find **incorrect** statement among the following

- (1)  $\text{C}^{13}$  is a radioactive isotope  
(2) Covalency of carbon greater than 4 is possible  
(3) Carbon can exhibit +2 & +4 oxidation state  
(4) In group - 14,  $\text{CO}_2$  is most acidic

Ans: (2)

17. Which of the following statements is **correct** about resonance and resonating structures?

- (1) Resonating structure with more covalent bonds is more stable  
(2) The resonance structures differ in position of electrons and relative position of atoms  
(3) The stability of resonance hybrid decreases with increasing number of equivalent resonating structure  
(4) Electronegative atom bearing positive charge in the canonical form doesn't exist

Ans: (1)



## MATHEMATICS

1. If words are arranged in a dictionary alphabetically, then rank of UDAYPUR is?

Ans: (1882)

2. The maximum value of  $n$  for which  $40^n$  divides  $60!$

Ans: (14)

3. Range of function if  $f(x) = \sin^{-1} \left( \frac{1}{x^2 - 2x + 2} \right)$

Ans:  $\left( 0, \frac{\pi}{2} \right]$

4. The value of sum  $S = \left( \frac{1}{3} + \frac{4}{7} \right) + \left( \left( \frac{1}{3} \right)^2 + \left( \frac{4}{7} \right)^2 + \left( \frac{1}{3} \right) \left( \frac{4}{7} \right) \right) + \left( \left( \frac{1}{3} \right)^3 + \left( \frac{1}{3} \right)^2 \left( \frac{4}{7} \right) + \left( \frac{1}{3} \right) \left( \frac{4}{7} \right)^2 + \left( \frac{4}{7} \right)^3 \right) + \dots$ , then  $S$  is equal to

Ans: (2.5)

5.  $3f(x) + 2f\left(\frac{M}{19x}\right) = 15x$ ,  $M = \sum_{i=1}^9 i^2$ ,  $f(5) - f(2) = ?$

Ans: (54)

6. Let the equation  $x^4 - ax^2 + 9 = 0$  have four real and distinct roots. Then the least integral value of  $a$  is

(1) 5

(2) 6

(3) 7

(4) 8

Ans: (3)

7. If  $f(x)$  is the area bounded in the first quadrant by  $x = 0$ ,  $x = 1$ ,  $y = x^2$ ,  $y = |ax - 5| - |1 - ax| + ax^2$  then find  $f(0) + f(1)$ .

Ans:  $\left( \frac{23}{3} \right)$

8. If  $z = (1 + i)(1 + 2i)(1 + 3i) \dots (1 + ni)$  and  $|z|^2 = 44200$  find  $n = ?$

Ans: (5)

9. The length of latus rectum of ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ , ( $a > b$ ), be 30. If it's eccentricity is the maximum value of function  $f(t) = -\frac{3}{4} + 2t - t^2$  then find  $(a^2 + b^2) = ?$

Ans: (496)



10. Let  $y = y(x)$  be a differentiable function in interval  $(0, \infty)$  such that  $y(1) = 2$ ,  $\lim_{t \rightarrow x} \left( \frac{t^2 y(x) - x^2 y(t)}{x-t} \right) = 3$ , for each  $x > 0$ , Then  $2y(2) =$

Ans: (9)

11. Let  $a_1, a_2, a_3, a_4$  be an A.P and common difference is 'l' and  $a_1 + a_2 + a_3 + a_4 = 48$  and  $a_1 a_2 a_3 a_4 + l^4 = 361$  Then largest term of A.P

Ans: (21)

12.  $X = \{x \in N : 1 \leq x \leq 19\}$  and for some  $a, b \in R, Y = \{ax + b : x \in X\}$ . If mean and variance of element  $Y$  are 30 and 120 then sum of all possible values of  $b$  is

Ans: (60)

13. Let  $f(x) = \int \frac{7x^{10} + 9x^8}{(1+x^2+2x^9)^2} dx, x > 0$  and  $f(1) = \frac{1}{4}$  then  $\lim_{x \rightarrow 0} f(x)$  is equal to

Ans: (0)

14. Let point  $(h, k)$  lies on  $x^2 + y^2 = 4$ , and  $(2h + 1, 3k + 2)$  lies on ellipse having eccentricity  $e$ . Then the value of  $\frac{5}{e^2}$

Ans: (9)

15. Consider these statements regarding function

$$f(x) = |\ln x| - |x - 1|$$

**Statement 1:**  $f(x)$  is differentiable for all  $x > 0$

**Statement 2:**  $f(x)$  is increasing in  $(1, \infty)$

**Statement 3:**  $f(x)$  is decreasing in  $(0, 1)$

(1) Statement 1 and statement 3 are correct

(2) All statements are true

(3) Statement 2 and statement 3 are correct

(4) Statement 1 and statement 2 are correct

Ans: (1)

16.  $\lim_{x \rightarrow 0} \frac{\tan(\tan x) - \tan(\sin x)}{\tan x - \sin x}$  is equal to

(1) 1

(2) 2

(3) -1

(4) 1/2

Ans: (1)



# Sri Chaitanya

17. Let the image of Parabola  $x^2 = 4y$ , in the line  $x - y = 1$  be  $(y + a)^2 = b(x - c)$ , where  $a, b, c \in N$  then  $a + b + c$  is equal to

(1)  $(y - 1)^2 = 4(x + 1)$

(2)  $(y + 1)^2 = 4(1 - x)$

(3)  $(y + 1)^2 = 4(x + 1)$

(4)  $(y - 1)^2 = 4(x - 1)$

Ans: (2)

18. Given  $\vec{a} = 2\hat{i} - \hat{j} - \hat{k}$ ,  $\vec{b} = \hat{i} + 3\hat{j} + 2\hat{k}$  and  $\vec{c}$  is a vector such that  $2(\vec{a} \times \vec{c}) + 3(\vec{b} \times \vec{c}) = 0$  and  $\vec{c} \cdot \vec{b} = 1$ , then find the value of  $|\vec{c} \times \hat{k}|^2$  is equal to

Ans:  $\left(\frac{49}{648}\right)$

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