

JEE Main 2024 April 4 Shift 2 Answer Key

1.

$$f(x) = \begin{cases} \frac{72^x - 9^x - 8^{2x} + 1}{\sqrt{2} - \sqrt{1 + 64^x}} & x \neq 0 \\ a \log_e 2 \cdot \log_e e^{13} & x = 0 \end{cases}$$

Answer: a=12

2.

$$\frac{x-2}{1} = \frac{y-4}{5} = \frac{z-2}{1}$$
$$\frac{x-2}{2} = \frac{y-2}{3} = \frac{z-3}{2} \quad \text{and } x=2y=z$$

Answer:

3.

x^4 x^5 x^6 $(1+x)^n$
 ${}^n C_4$ ${}^n C_5$ ${}^n C_6$ \rightarrow AP

Answer: $1 + \frac{(n-4)(n-5)}{30} = \frac{2(n-4)}{5}$

4.

? Which of the following have pyramidal shape?

- a) $S_2O_3^{2-}$
- b) SO_4^{2-}
- c) SO_3^{2-}
- d) $S_2O_7^{2-}$

Answer: (c) SO_3^{2-}

5.

? IUPAC name of Catechol is-

- a) Benzene, 1,2-diol
- b) Benzene-1,3-diol
- c) Benzene-1,4-diol
- d) 3-Hydroxyphenol

Answer: (a) Benzene, 1,2-diol

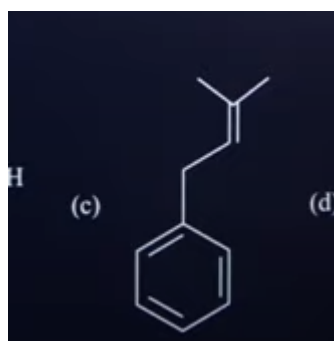
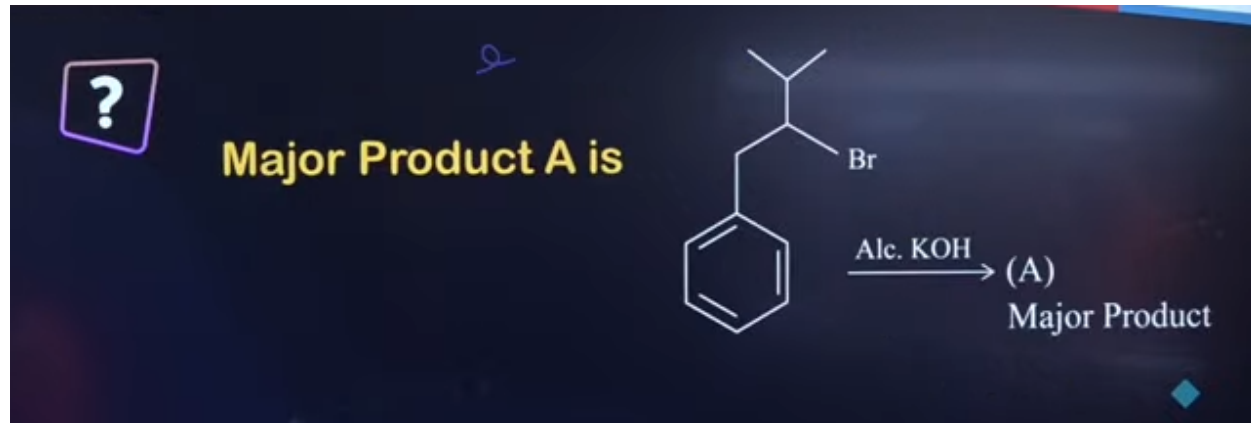
6.

? The correct order of ionisation enthalpy for Li, Na, Cl, F is:

- a) $\text{Na} < \text{Li} < \text{Cl} < \text{F}$
- b) $\text{Li} < \text{Na} < \text{Cl} < \text{F}$
- c) $\text{Na} < \text{Li} < \text{F} < \text{Cl}$
- d) $\text{F} < \text{Cl} < \text{Li} < \text{Na}$

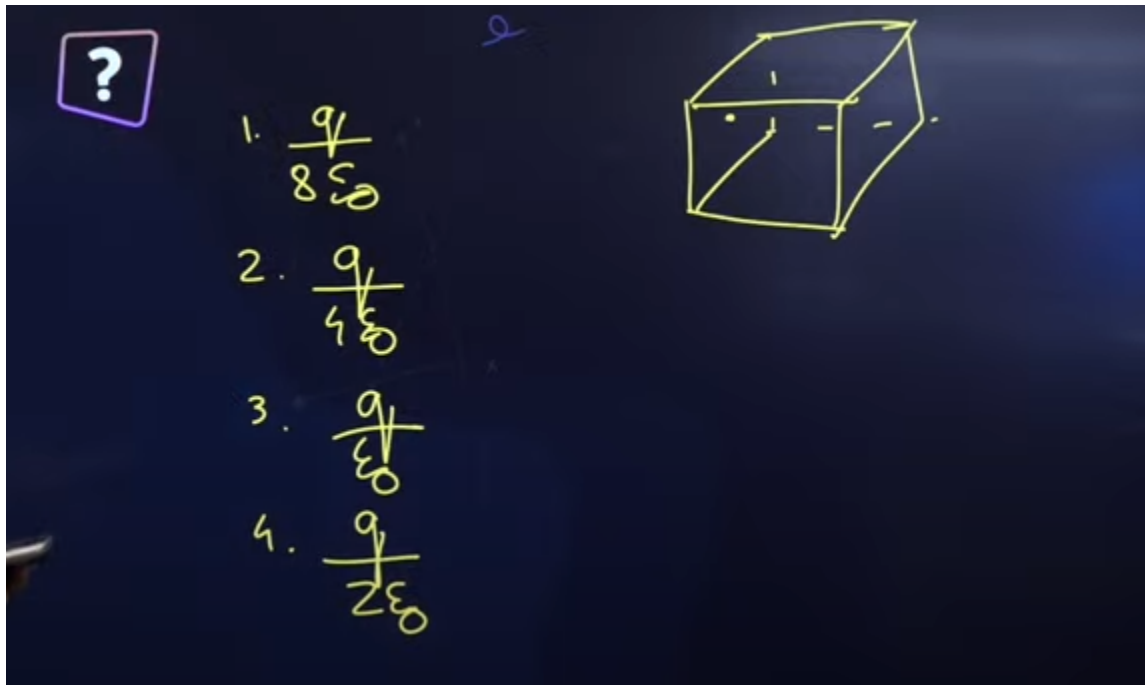
Answer: (a) $\text{Na} < \text{Li} < \text{Cl} < \text{F}$

7.



Answer:

8.



Answer: (4) $q/2\epsilon_0$

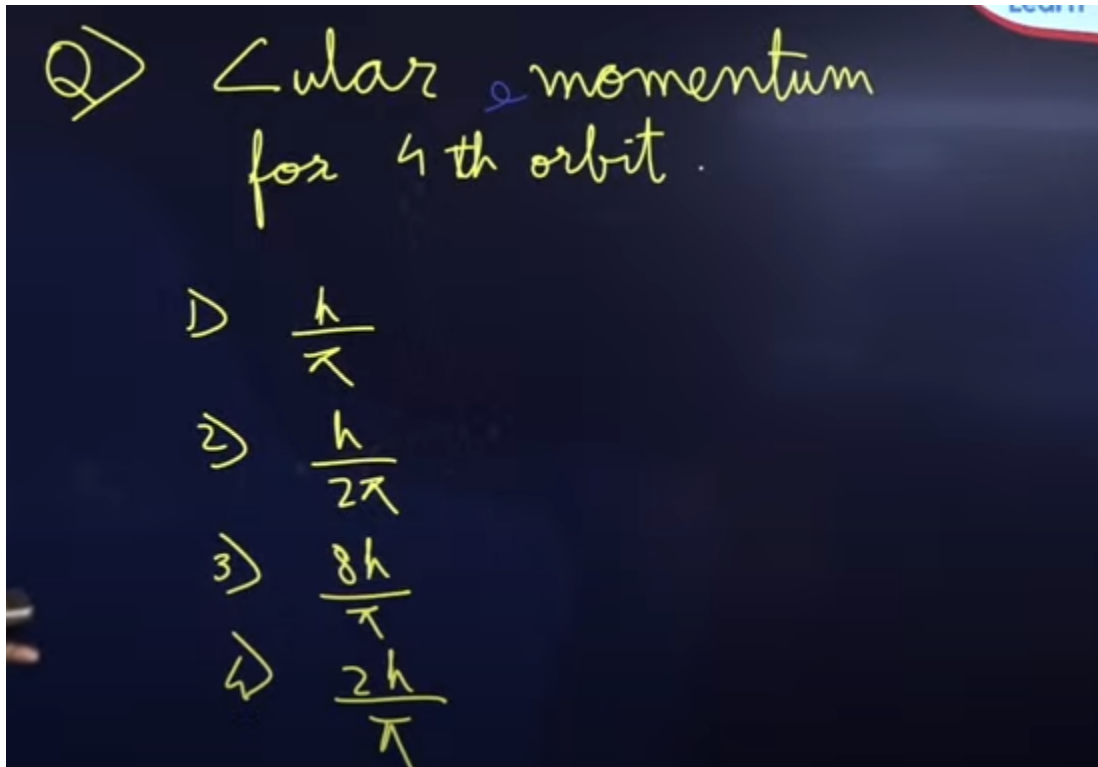
9.

Bulb rating 50W - 200V
connected across 100V.
Power consumed:

- 1) 50W
- 2) 25W
- 3) 100W
- 4) 12.5W

Answer: (4) 12.5W

10.



Answer: (4) $2h/\pi$

11.

Q) Ht of satellite from earth's surface

1) $\left(\frac{T^2 R^2 g}{4\pi}\right)^{1/2} - R$

2) $\left(\frac{T^2 R^2}{4\pi^2 g}\right)^{1/3} - R$

3) $\left(\frac{T^2 R^2 g}{4\pi^2}\right)^{1/3} - R$

4) $\left(\frac{T^2 R^2 g}{4\pi^2}\right)^{-1/3} - R$

3) $\left(\frac{T^2 R^2 g}{4\pi^2}\right)^{1/3} - R$

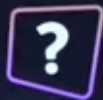
Answer:

12.

? The value of $\frac{1 \times 2^2 + 2 \times 3^2 + \dots + 100 \times (101)^2}{1^2 \times 2 + 2^2 \times 3 + \dots + 100^2 \times 101}$ is

Answer: a=12

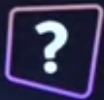
13.



Let $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ and $B = I + \text{adj}(A) + (\text{adj } A)^2 + \dots + (\text{adj } A)^{10}$. Then the sum of all elements of the matrix B is -

Answer: -88

14.



The area (in sq.units) of the region described by $\{(x, y): y^2 \leq 2x, \text{ and } y \geq 4x - 1\}$ is

Answer: 9/16

15.

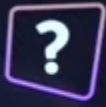


Arrange the following in ascending order of wave length.

- 1) Gama rays
- 2) x-ray, is
- 3) Infra-red ray,
- 4) microwave,

Answer: 1 < 2 < 3 < 4

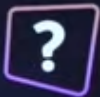
16.



The ratio of width of slits in a YDSE is 16:1.
Find the ratio of max to min Intensities formed

Answer: 4:1

17.



A 2 kg brick is placed on an inclined plane of inclination 45° . The brick is at rest. The minimum coefficient of static friction is:

(a) 0.5

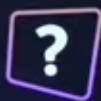
(b) $\sqrt{3}$

(c) 1

(d) $\frac{1}{\sqrt{3}}$

Answer: (c)1

18.



One mole of an ideal monoatomic gas compressed adiabatically from volume $2V$ to V . If initially temperature of gas was T then the magnitude of work done in this process is

a) $\frac{3}{2}RT(2^{\frac{1}{2}} - 1)$

b) $\frac{3}{2}RT(2^{\frac{2}{3}} - 1)$

c) $\frac{2}{3}RT(2^{\frac{2}{3}} - 1)$

d) $\frac{2}{3}RT(\sqrt{2} - 1)$

b) $\frac{3}{2}RT(2^{\frac{2}{3}} - 1)$

Answer:

19.

What is the sum of number of σ and π bonds present in 2-oxo-hex4-yne-oic acid?

Answer: 18

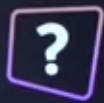
20.

Calculate heat for Isothermal process if expansion occurs from 20L to 60L against 5Atm external pressure

$$Q = + 200 \text{ Atm L.}$$

Answer:

21.



a, b, c are in AP, $a + 3, b, c + 2$ are in G.P, $a > 10$, Then then Arithmetic mean of a, b, c is 8 then cube of Geometric mean.

$$\begin{array}{ccc} & \downarrow & \\ (s-k) & s & (s+k) \end{array}$$

Answer:

22.

Let $f(x) = \int_0^x (t + \sin(1 - e^t)) dt, x \in \mathbb{R}$. Then; $\lim_{x \rightarrow 0} \frac{f(x)}{x^3}$ is equal to

Answer: 1/6

23.

For $\lambda > 0$, Let θ be the angle between the vectors

$$\vec{a} = \hat{i} + \lambda\hat{j} - 3\hat{k} \text{ and } \vec{b} = 3\hat{i} - \hat{j} + 2\hat{k}.$$

If the vector $\vec{a} + \vec{b}$ and $\vec{a} - \vec{b}$ are mutually perpendicular, then the value of $(14\cos\theta)^2$ is equal to -

Answer: 4

24.

Let $f(x) = 3\sqrt{x-2} + \sqrt{4-x}$ be a real valued function. If α and β are respectively the minimum and the maximum value of f , then $\alpha^2 + 2\beta$ is equal to

Answer: 42

25.

A parabola $y^2 = 12x$ has a chord PQ with mid-point (4,1) then line PQ passes through:

- (a) $(\frac{1}{2}, -20)$
- (b) $(\frac{1}{2}, -10)$
- (c) $(10, 1/2)$
- (d) $(-10, -\frac{1}{2})$

Answer:

26.

A relation defined as $(x_1, y_1)R(x_2, y_2): x_1 \leq x_2 \& y_1 \leq y_2$ and given that

(a) R is reflexive but not symmetric

(b) R is transitive

Then,

$(1, 2)$ $(3, 5)$ $(3, 7)$

- (a) (a) is true and (b) is false
- (b) (a) is false and (b) is true
- (c) Both (a) and (b) are true
- (d) Both (a) and (b) are false

Answer: (c) Both (a) and (b) are true