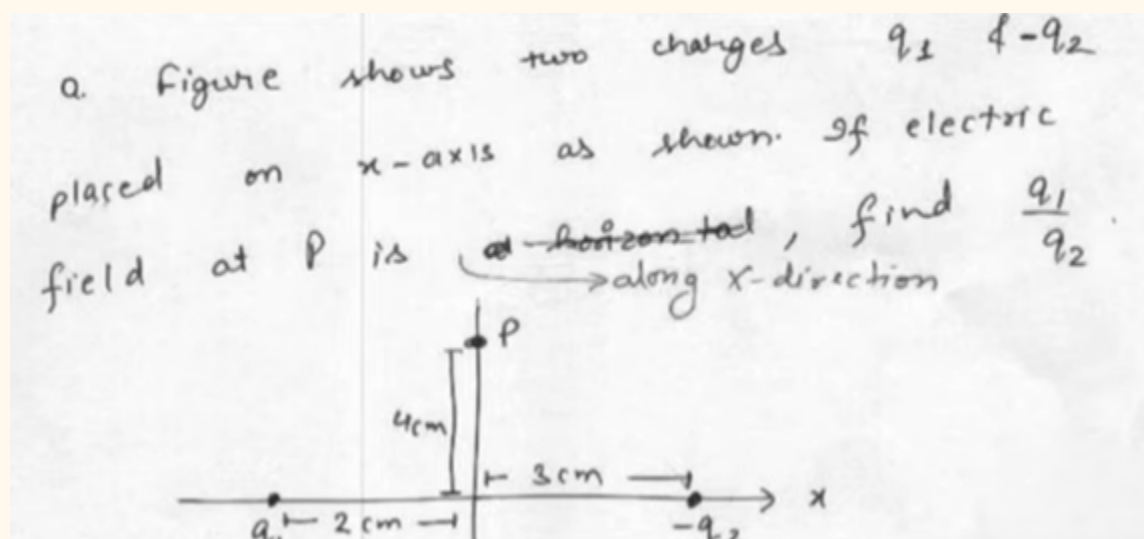


JEE Main 2024 Question Paper April 8 Shift 2 (B.E./B.Tech)

JEE Main Physics Questions

Ques 1.



- A. $4\sqrt{5} / 25$
- B. $8\sqrt{5} / 25$
- C. $12/25$
- D. $16\sqrt{5} / 25$

Ans. B

Ques 2.

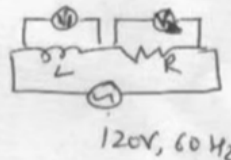
a. A disk of mass M , radius R is rotating about an axis passing through its centre and perpendicular to its plane with angular speed ω . If another disk of mass $\frac{M}{2}$ and radius R is gently placed over it what will be their common angular velocity after some time

- A. $\omega/5$
- B. $\omega/2$
- C. $2\omega/3$
- D. $\omega/4$

Ans. C

Ques 3.

a. In given AC circuit containing resistor R & inductor L and source emf, two voltmeter V_1 & V_2 are connected as shown. If $V_2 = 36$ volts then inductance of inductor is (Resistance is $\sqrt{3} \Omega$.)



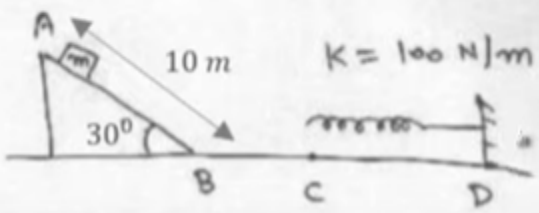
- A. 0.08 H
- B. 0.8 H

- C. 8 H
- D. 80 H

Ans. A

Ques 4.

A block of mass 5 kg is released as shown in the figure. Surface CD is rough with $\mu = 0.5$, rest of all the surfaces are smooth. Find the maximum compression in the spring
(Initially spring is in its natural length.)



The diagram shows a block of mass m at the top of an inclined plane AB of length 10 m and angle 30° . The block moves down to point B . From B , it moves horizontally to point C . From C , it moves horizontally to point D , where it compresses a spring with spring constant $K = 100\text{ N/m}$. The surface CD is rough with coefficient of friction $\mu = 0.5$.

- A. 1.5 m
- B. 2.0 m
- C. 3.5 m
- D. 2.5 m

Ans. B

Ques 5.

a. A physical quantity P depends on electric field (E) and permittivity of free space (ϵ_0) as

$$P \propto E \epsilon_0^2,$$

Find dimension of P

- A. $[ML^{-5}T^5I^3]$
- B. $[M^{-1}L^{-5}T^5I^3]$
- C. $[M^2L^{-5}T^5I^2]$
- D. $[MLTI]$

Ans. B

Ques 6.

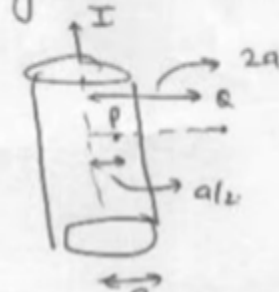
a. An electron and a proton has same debroglie wavelength. If K_e and K_p are their respective kinetic energies, then

- A. $k_p > k_e$
- B. $k_p < k_e$
- C. $k_p = k_e$
- D. None of these

Ans. B

Ques 7.

a. Find ratio magnetic field at point P to that at point Q.
Point P is inside the ^{long} solid cylinder & Q is outside the cylinder.
Current is uniform through the cross-section of cylinder



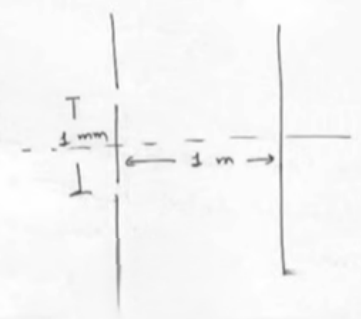
- A. 2:1
- B. 1:1
- C. 1:2
- D. 4:1

Ans. B

Ques 8.

a. In a YDSE ^{shown} a monochromatic light of wavelength 500nm is incident. At point P, 10th maxima is formed. Now the two slits are replaced with a single slit of width w_1 placed at the centre. ~~1st~~ 1st diffraction minima is observed at P. Find w_1 .

(diagram for question is behind.)



- A. 0.5 mm
- B. 1 mm
- C. 0.1 mm
- D. 0.2 mm

Ans. C

Ques 9.

a. An object is projected such that its horizontal range and maximum height is same, then angle of projection is

- A. $\tan^{-1}2$
- B. $\tan^{-1}1$
- C. $\tan^{-1}3$
- D. $\tan^{-1}4$

Ans. D

Ques 10.

a. A wave is given by the equation $y = A \sin\{\pi(330t - x)\}$, then frequency of the wave is

- A. 330 Hz
- B. 660 Hz
- C. 165 Hz
- D. 1/330 Hz

Ans. C

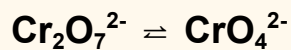
JEE Main Chemistry Questions

Ques 1. Molecular orbital σ^* represents:

- A. $\psi_A + \psi_B$
- B. $\psi_A - \psi_B$
- C. $\psi_A - 2\psi_B$
- D. $\psi_A + 2\psi_B$

Ans. B

Ques 2. Consider the given reaction:



Above reaction shifts in forward direction in

- A. Acidic Medium
- B. Basic Medium
- C. Neutral Medium
- D. Slightly acidic medium

Ans. B

Ques 3. If de- Broglie wavelength of electron is equal to de- Broglie wavelength of proton, then what is the relation between their kinetic energy

- A. $KE_e > KE_p$**
- B. $KE_p > KE_e$**
- C. $KE_p = KE_e$**
- D. $2KE_e = KE_p$**

Ans. A

Ques 4. Select the correct options:

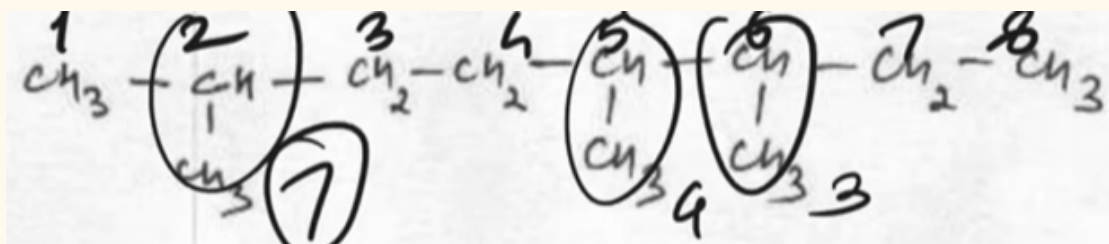
Statement 1: Benzene sulphonyl chloride reacts with 1°, 2° and 3° amines.

Statement 2: All products of the reaction above are soluble in NaOH.

- A. Statement 1 is true and statement 2 is false.**
- B. Statement 1 is false and statement 2 is true.**
- C. Statement 1 and statement 2, both are true.**
- D. Statement 1 and statement 2, both are false.**

Ans. D

**Ques 5. Consider the following compound:
What is the IUPAC nomenclature of the compound?**



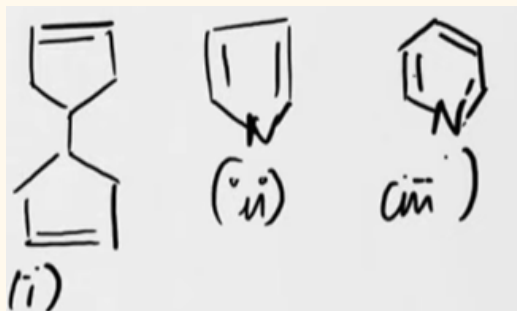
- A. 2,5,6-trimethyl octane
- B. 3,4,7-trimethyl octane
- C. 2,4-ethyl, 3-methyl octane
- D. Isopropyl hexane

Ans. A

Ques 6. The total number of compounds having Bond order 2 among the following are: F_2 , N_2 , Ne_2 , O_2 , Li_2 , Be_2 , C_2

Ans. 2

Ques 7. Which of the following are aromatic compounds?



- A. Only (i) and (ii)
- B. Only (ii) and (iii)
- C. Only (i) and (iii)
- D. All are aromatic

Ans. B