

JEE Main 2024 Question Paper April 9 Shift 2 (B.E./B.Tech)

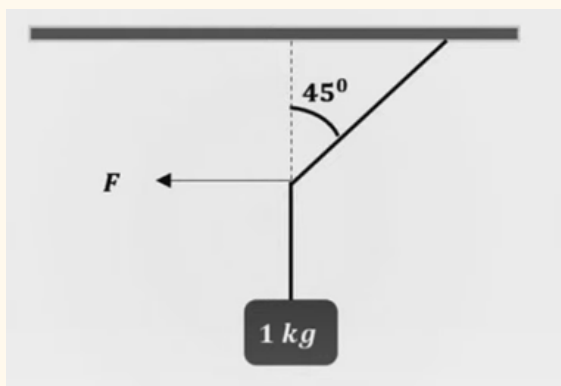
JEE Main Physics Questions

Ques 1. Dimensional formula of Plank's constant is:

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

Ans. B

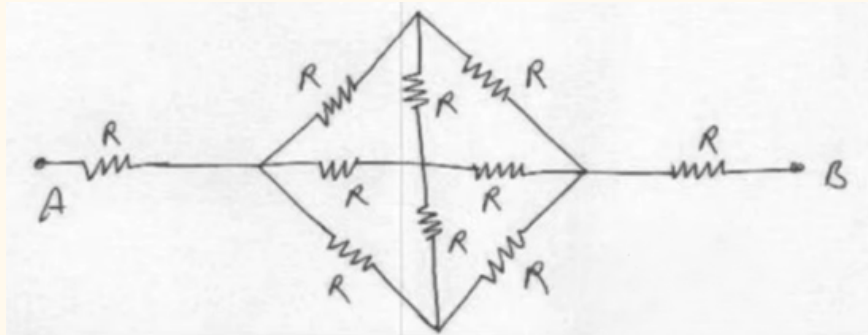
Ques 2. Find the magnitude of force F , if the given system is in equilibrium



- A. 10 N
- B. $10\sqrt{2}$ N
- C. 0 N
- D. $1 / 10\sqrt{2}$ N

Ans. A

Ques 3. The equivalent resistance between terminal A and B in the network shown



- A. $4R/3$
- B. $8R/3$
- C. $3R$
- D. $5R/2$

Ans. B

Ques 4. The nuclei at rest breaks into two parts with mass ratio 1 : 2. The ratio of their velocity and direction is

- A. Opposite Direction 2 : 1
- B. Same Direction 1 : 2
- C. Opposite Direction 1:1
- D. Same Direction 1 : 1

Ans. A

Ques 5. Two cars A and B are moving towards each other with speed 20 m/s each. When 300 m apart, they both apply breaks which causes deceleration of 2 m/s^2 . The distance between them when they stop will be:

- A. 100 m
- B. 50 m
- C. 150 m
- D. 200 m

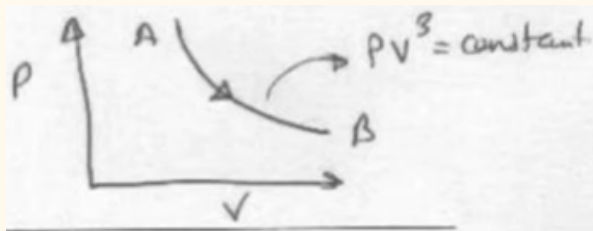
Ans. A

Ques 6. For a wire, the original resistance was 50Ω at the initial temperature of 27°C . When the temperature is increased, its resistance becomes 62Ω . If the thermal coefficient of resistivity of the wire is $2.4 \times 10^{-2} \text{ K}^{-1}$, find the final temperature.

- A. 45°C
- B. 37°C
- C. 48°C
- D. 32°C

Ans. B

Ques 7. Find the work done by a monoatomic gas from A and B. Here the temperature of gas (1 mol) changes from 300 K to 330 K.



- A. 125 J
- B. 250 J
- C. 500 J
- D. 6250 J

Ans. A

Ques 8. Two bubbles having radii r_A and r_B are having excess pressure P_A and P_B in them. If $P_A = 3P_B$, find r_A/r_B

- A. 9: 1
- B. 1:9
- C. 1:3
- D. 3 : 1

Ans. C

Ques 9. In the given ray diagram, find the distance (in cm) between the two convex lenses.

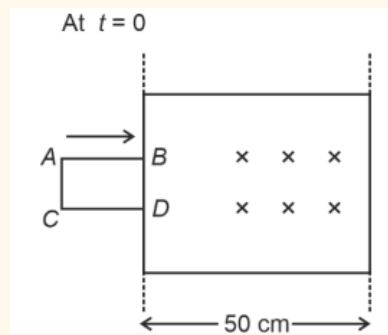


Ans. 25

Ques 10. Find the work done (in J) by force $F = 3x^2 + 2x - 5$ in moving a particle $x = 2$ to $x = 4$.

Ans. 58

Ques 11. Find the induced emf in the square loop of side 15 cm moving with 2 cm/s after 10 seconds.



- A. 0**
- B. 0.3V**
- C. 3V**
- D. 9V**

Ans. A

Ques 12. A proton and deuteron, having same kinetic energy, enters a transverse uniform magnetic field. Radius of circular paths for proton and deuteron are in ratio of

- A. $\sqrt{2}$**
- B. $1/2\sqrt{2}$**
- C. $1/\sqrt{2}$**
- D. $2\sqrt{2}$**

Ans. C

JEE Main Chemistry Questions

**Ques 1. Correct order of bond angle of following compounds is:
BF₃, PF₃, ClF₃**

- A. BF₃ > PF₃ > ClF₃**
- B. PF₃ > ClF₃ > BF₃**
- C. ClF₃ > PF₃ > BF₃**
- D. BF₃ > ClF₃ > PF₃**

Ans. A

Ques 2. Identify the correct electronic configuration of Einsteinium is

- A. [Rn]5f¹⁴6d¹⁷s²**
- B. [Rn]5f¹¹7s²**
- C. [Rn]5f¹⁰6d¹⁷s²**
- D. [Rn]5f¹¹6d¹⁷s¹**

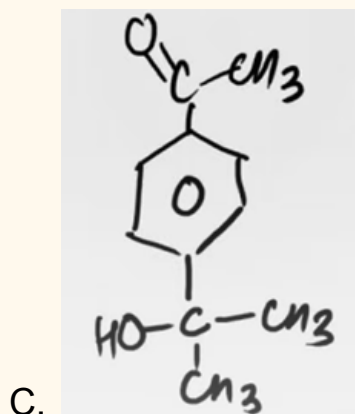
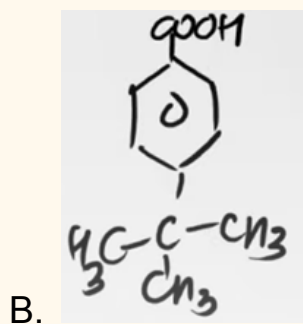
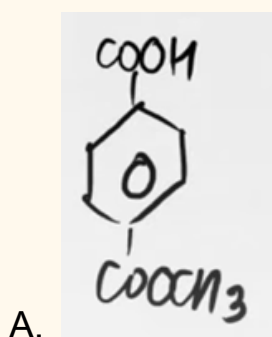
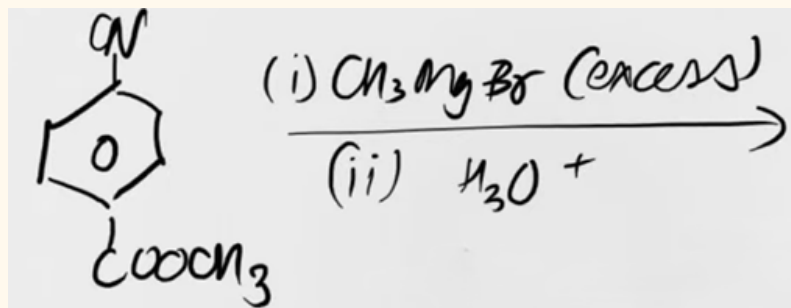
Ans. B

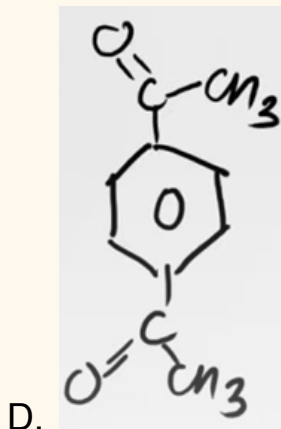
Ques 3. Ca²⁺ makes which type of complex with EDTA

- A. Trigonal bipyramidal**
- B. Square Planer**
- C. Tetrahedral**
- D. Octahedral**

Ans. D

Ques 4. The product obtained in the following reaction is:





Ans. C

Ques 5. Fuming sulphuric acid has how many oxygen atoms?

Ans. 7

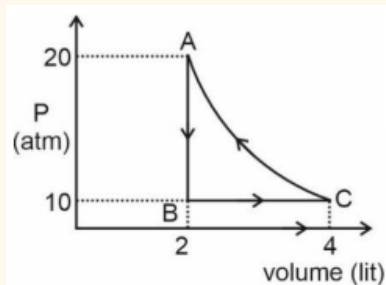
Ques 6. Total sum of number of electrons in π^* orbitals of O_2 , O_2^+ and O_2^- is:

Ans. 6

Ques 7. Which one of the following statements regarding glucose is incorrect?

- A. Glucose is one of the monosaccharides of sucrose
- B. Glucose dissolves in water because it has aldehyde group.
- C. Glucose has six carbon atoms in its structure
- D. Glucose is an aldose

Ans. B



Ques 8.

What is the work done on the gas in cyclic process ABCA

- A. +773.7 J**
- B. -773.7 J**
- C. +4762.3 J**
- D. -4762.3 J**

Ans. A

Ques 9. Which of the following compounds does not give Tollen's test?

- A. Formaldehyde**
- B. Formic acid**
- C. Benzaldehyde**
- D. Acetone**

Ans. D

Ques 10. What is the correct order of C – C bond length of ethane, ethene and ethyne?

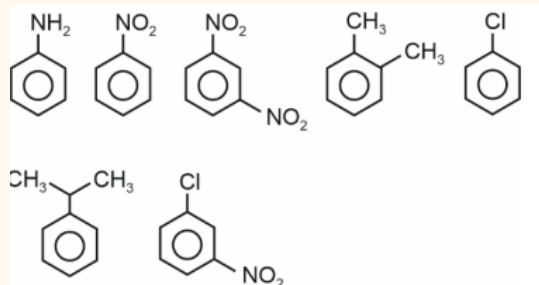
- A. Ethane > Ethene > Ethyne**
- B. Ethene > Ethane > Ethyne**
- C. Ethyne > Ethene > Ethane**
- D. Ethyne > Ethane > Ethene**

Ans. A

Ques 11. Among the elements – Sc, Ti, V, Cr, Mn find magnetic moment of element which have highest ionization enthalpy in +2 oxidation state. [Nearest integer]

Ans. 6

Ques 12. How many of the following compounds will give Friedel Craft's reaction?



Ans. 3

JEE Main Mathematics Questions

Ques 1. If $(z-2i)/(z+2i)$ is purely imaginary, then maximum value of $|z + 8 + 6i|$ is equal to

- A. 6
- B. 8
- C. 10
- D. 12

Ans. D

$$\int_{\frac{1}{4}}^{\frac{3}{4}} \cos \left(2 \cot^{-1} \sqrt{\frac{1-x}{1+x}} \right) dx =$$

Ques 2.

- A. $-\frac{1}{4}$
- B. $\frac{3}{2}$

- C. 1/16
- D. -4/3

Ans. A

$$\lim_{x \rightarrow 0} \frac{e - (1+2x)^{\frac{1}{2x}}}{x}$$

Ques 3.

- A. e
- B. e/4
- C. e/8
- D. 11e/24

Ans. A

Ques 4. In the given data

| x_f | f_j |
|-------|-------|
| C | 2 |
| 2C | 1 |
| 3C | 1 |
| 4C | 1 |
| 5C | 1 |
| 6C | 1 |

If $\sigma^2 = 160$. Find the value of |C|.

- A. 7
- B. 5
- C. 6
- D. 4

Ans. A

$$\int_{-1}^2 \log(x + \sqrt{x^2 + 1}) dx$$

Ques 5.

- A. $\log[(2 + \sqrt{5})^2 * (\sqrt{2} - 1)] - \sqrt{5} + \sqrt{2}$

- B. $\log[(2 + \sqrt{5})^2 * (\sqrt{2} - 1)] + \sqrt{5} - \sqrt{2}$
C. $\log[(2 + \sqrt{5})^2 * (\sqrt{2} - 1)] + \sqrt{5} + \sqrt{2}$
D. $\log(2 + \sqrt{5})^2 + \sqrt{5} + \sqrt{2}$

Ans. A

Ques 6. Dice is thrown 3 times, then find the probability that $x_1 < x_2 < x_3$. (here $x_1, x_2, x_3 \in [1, 6]$) (where x_1, x_2, x_3 are outcomes on dice)

- A. $7/54$
B. $5/54$
C. $11/54$
D. $17/54$

Ans. 2

Ques 7. Find the area bounded by ellipse $x^2 + 3y^2 = 18$ below the line $y = x$ is (in first quadrant)

- A. $3\pi + 1$
B. $\sqrt{3} * \pi$
C. $3\pi - \frac{3}{4}$
D. $3\pi + \frac{1}{4}$

Ans. B

Ques 8. Sum of infinite terms of a, ar, ar^2, \dots and $a^3r^3, a^3r^6, a^3r^9, \dots$ is 57 and 9747 respectively, then $a + 18r$ is

Ans. 31

Ques 9. The number of numbers between 100 to 1000 such that sum of their digits is 14, is

Ans. 70.00

Ques 10. Find the number of solutions of $3\sin^{-1}x + 2\cos^{-1}x = 2\pi/5$.

Ans. 0

Ques 11. If $f(x) = 2(2 - p)x - (p^2 - 6p + 8) \cos 4x + 7$, then for what values of p , does $f(x)$ not have a vertical point?

Ans. 4