JEE Main 2023 Answer Key

Date and Shift: April 11 Shift 1 **Memory-Based Questions**

Physics Answer Key

Question No.	Answer Key
1	B
2	A
3	A
4	C
5	32
6	A
7	A
8	B
9	C
10	B

Chemistry Answer Key

Question No.	Answer Key
1	1:1
2	35 %
3	Ne > Cl_2 > UF_6
4	F>N>O>C>Be>B>Li
5	A-3 , B-1, C-2, D-4
6	A
7	A
8	3
9	D
10	A

Mathematics Answer Key

Question No.	Answer Key
1	B
2	44
3	B
4	C
5	A
6	10
7	58
8	16
9	D
10	2736

JEE Main 2023 Physics Question Paper

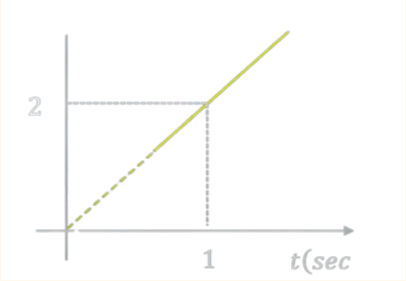
Question 1. Force acting on a particle moving along the x - axis is given by F = (2 + 3x)i. The work done by this force from x = 0 to x = 4 m is

A. 16J
B. 32J
C. 4J
D. 8J

Question 2. If half life of a radio-active nuclide A is equal to average life of another radio-active nuclide B. Find the ratio of decay constant of A to that of B.

A. In 2:1
B. 1: In 2
C. 2: In 2
D. In 2:2

Question 3. Variation of magnetic field through a coil of area 4 m^2 is shown in figure. What is the EMF induced in the coil (in mV)?



A. 8
B. 16
C. 4
D. 2

Question 4. The characteristics of two coil is given below-
If the magnetic moment of both coil A and B are equal then choose the correct relation,

Coil A	Coil B
Radius r_A = 10 cm	r_B = 20 cm
Number of turns N_A	N_B
Current I_A	I_B

A. $2N_AI_A = N_BI_B$
B. $N_AI_A = N_BI_B$
C. $N_AI_A = 4N_BI_B$
D. $N_AI_A = 2N_BI_B$

Question 5. Equation of progressive wave is y = A sin(160t — 0.5x). Let the speed of the wave be 10x then, find x.

Question 6. If light is passing through a medium of critical angle 45°, then the wave speed will be

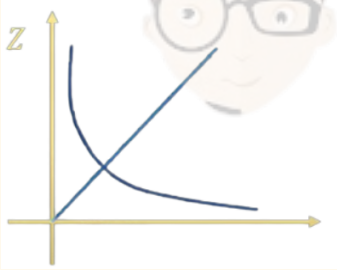
A. $3/\sqrt{2} \times 10^8$ m/s

B. $3\sqrt{2} \times 10^8$ m/s
C. $3/2 \times 10^8$ m/s
D. 3×10^8 m/s

Question 7. In a moving coil galvanometer if the number of turns increases by 25%, then change in voltage sensitivity is?

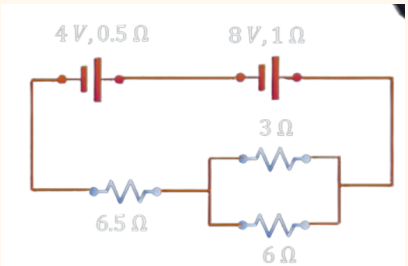
A. 0
B. 1%
C. 25%
D. 50%

Question 8. The variation of impedance (Z) with angular frequency (w) for two electrical elements is shown in the graph given. If XL,Xc, and R are inductive reactance, capacitive reactance and resistance respectively, then



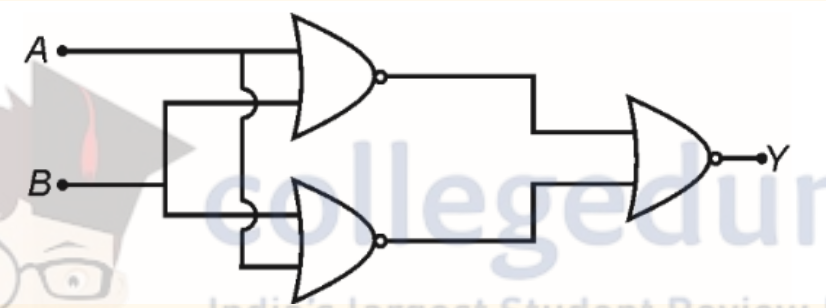
A. A is resistor B is inductor
B. A is inductor B is capacitor
C. A is inductor B is resistor
D. A is capacitor B is inductor

Question 9. Find the current flowing in 3Ω resistor in the given circuit



A. 0.4A
B. 0.2A
C. 0.8A
D. 0.6A

Question 10. Identify the logic operation of following circuit.



A. AND
B. OR
C. NOR
D. NAND

JEE Main 2023 Chemistry Question Paper

Question 1. Find the spin magnetic moment ratio for complexes $[Cr(Cn)_6]^{-3}$ & $[Cr(H_2O)_6]^{+3}$

Question 2. 25% of 250g sugar solution & 40% of 500g sugar solution are mixed then find out the mass percentage in the solution.

Question 3. In a container at a constant temperature , arrange the RMS velocity of the following: Ne, Cl_2 , UF_6

Question 4. Correct order of first ionization energy of Li, Be, C, B, N, O, F

Question 5. Match the Column

Column I	Column II
A. ClO_2^-	1. Linear
B. N_3^-	2. Tetrahedral
C. NH_4^+	3. Bent
D. SF_4	4. See-Saw

Question 6. Which of the following is not ambidentate ligand

A. $C_2O_4^{-2}$, H_2O
B. $EDTA^{-4}$, NO_2^-

C. NO_2^-, SCN^-
D. SCN^-, CN^-

Question 7. Which of the following can be represented as a meridional isomer?

A. $[Pt(NH_3)_3Cl_3]^+$
B. $[Pt(en)_3]^{4+}$
C. $[Pt(en)_2Cl_2]^{2+}$
D. $[Pt(en)_2(NH_3)_2]^{4+}$

Question 8. Find the number of atoms per unit cell if edge length is 300pm, density = 3 g/cm^3 , molecular mass = 40 g(nearest integer)

Question 9. Identify the correct statement about the compound GaAlC14

A. Chlorine atom is bonded to both Ga and Al
B. Ga is cationic part and less electronegative than Al
C. Chlorine atom forms co — ordinate bond with Ga
D. Chlorine atom is bonded to Al

Question 10. Which type of copper is formed by the following reactions?

$2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$
$2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$

A. Blister copper
B. Copper crisp
C. Reduced copper
D. Copper slag

JEE Main 2023 Mathematics Question Paper

Question 1. A rectangle is drawn by lines x = 0, x = 2, y = 0 and y = 5. Points A and B lie on coordinate axes. If line AB divides the area of rectangle in 4 : 1, then the locus of mid-point of AB is?

A. Circle
B. Hyperbola
C. Ellipse
D. Straight line

Question 2. 5 boys with allotted roll numbers and seat numbers are seated in such a way that no one sits on the allotted seat. The number of such seating arrangements is?

Question 3. Let $M = [a_{ij}]_{2*2}$, $0 \leq i, j \leq 2$, where $[a_{ij}] \in \{0,1,2\}$ and A be the event such that M is invertible then P(A) is?

A. 49/81
B. 16/27
C. 47/81
D. 46/81

Question 4. The number of solutions of $\cos^4\theta - 2\cos 2\theta + 3\sin^6\theta + 1 = 0$ in $[0, 2\pi]$ is

A. 1

B. 2
C. 3
D. 4

Question 5. Let awards in event A is 48 and awards in event B is 25 and awards in event C is 18 and also n(A ∪ B ∪ C) = 60, n(A ∩ B ∩ C) = 5, then how many got exactly two awards is?

A. 21
B. 25
C. 24
D. 23

Question 6. Consider the plane 2x + y – 3z = 6. If (α, β, γ) is the image of point (2, 3, 5) in the given plane, then $\alpha + \beta + \gamma$ = _____

Question 7. Consider two sets A and B. Set A has 5 elements whose mean & variance are 5 and 8 respectively. Set B has also 5 elements whose mean & variance are 12 & 20 respectively. A new set C is formed by subtracting 3 from each element of set A and by adding 2 to each element of set B. The sum of mean & variance of the set C is _____.

Question 8. The number of rational terms in the expansion of $(3^{3/4} + 5^{3/2})^{60}$?

Question 9. Let a and b are roots of $x^2 – 7x – 1 = 0$. The value of $(a^{21} + b^{21} + a^{17} + b^{17}) / (a^{19} + b^{19})$ is?

A. 29

B. 49
C. 53
D. 51

Question 10. The mean of coefficients of x, x^2, ..., x^7 in the binomial expansion of $(2 + x)^9$ is?