

Subject: Physics
Set Name: V1_Set04
Code: 322
Exam Date: 17-04-2026
SLOT: 2

Question ID	12220
Question Type	MCQ
Question	In the process of charging via electrostatic induction, the mass of negatively charged body_____. 1. increases 2. decreases 3. remains constant 4. may increase or decrease depending on the shape of the body
Options	
A	1
B	2
C	3
D	4

Question ID	12221
Question Type	MCQ
Question	Identify the CORRECT statements in the following: A. Coulomb's law of electric force is valid for point charges only. B. Two electric field lines never intersect each other. C. A charged particle free to move in an electric field always moves along the electric line of force. D. A stationary charge produces an electrostatic field, but does not produce a magnetic field. Choose the correct answer from the options given below: 1. A, B and C Only 2. B, C and D Only 3. A, B and D Only 4. A, C and D Only
Options	
A	1
B	2
C	3
D	4

Question ID	12222
Question Type	MCQ
Question	Twenty seven drops of same size are charged at 220 V each. Now, they join together to form a bigger drop. The potential of the bigger drop is 1. 980 V 2. 1260 V 3. 1650 V 4. 1980 V
Options	
A	1
B	2
C	3
D	4

Question ID	12223
Question Type	MCQ
Question	A charged spherical conductor has a surface charge density of 0.7 Cm^{-2}. When its charge is increased by 0.44 C, the charge density changes by 0.14 Cm^{-2}. The radius of the spherical conductor is:
Options	0.3 m 0.5 m 0.6 m 0.7 m
A	1
B	2
C	3
D	4

Question ID	12224
Question Type	MCQ
Question	Identify the CORRECT statements among the following: A. Ohm's Law is applicable to all conductors of electricity. B. A current carrying wire is electrically charged. C. The drift velocity of electrons in a metallic wire will decrease if the temperature of the wire is increased. D. The internal resistance of a cell is a defect of the cell. Choose the correct answer from the options given below: - A and B Only - B and C Only - C and D Only - A and D Only
Options	
A	1
B	2
C	3
D	4

Question ID	12225
Question Type	MCQ
Question	A cell of emf 1.1 V and internal resistance 0.5Ω is connected to a wire of resistance 0.5Ω. An additional cell of the same emf is connected in series but the current in the wire remains the same. The internal resistance of the second cell is:
Options	1.0Ω 1.6Ω 1.8Ω 2.2Ω
A	1
B	2
C	3
D	4

Question ID	12226
Question Type	MCQ
Question	A magnetic material at STP is placed in an external magnetic field. When the field is increased or the temperature is lowered, its magnetization increases until it reaches a saturation value. The material is :

- | | |
|----------|--|
| Question | 1. Diamagnetic
2. Paramagnetic
3. Ferromagnetic
4. Superconductor |
| Options | |
| A | 1 |
| B | 2 |
| C | 3 |
| D | 4 |

Question ID	12227
Question Type	MCQ
Question	What is the magnetic flux (ϕ_B) through a surface of area A placed in a uniform magnetic field $\vec{B}$? $\phi_B = \vec{B} \times \vec{A}$ $\phi_B = \vec{B} \cdot \vec{A}$ $\phi_B = \vec{A} \times \vec{B}$ $\phi_B = \frac{\vec{B}}{\vec{A}}$
Options	
A	1
B	2
C	3
D	4

Question ID	12228
Question Type	MCQ
Question	When current in a coil of self inductance (L) changes with time, what is the self-induced emf (ε) in the coil? $\varepsilon = - L \frac{dI}{dt}$ $\varepsilon = L \frac{dl}{dt}$ $\varepsilon = - I \frac{dL}{dt}$ $\varepsilon = I \frac{dL}{dt}$
Options	
A	1
B	2
C	3
D	4

Question ID	12229
Question Type	MCQ
	A plane electromagnetic wave travels in free space along +x-direction. At a particular point in space and time, the electric field is $\vec{E} = 12 \cdot 3 \hat{j}$ V/m. What is magnetic field $\vec{B}$ at this point?

Question	1. $\vec{B} = 5 \cdot 1 \times 10^{-8} \hat{k} \text{ T}$ 2. $\vec{B} = 4 \cdot 1 \times 10^{-8} \hat{k} \text{ T}$ 3. $\vec{B} = 5 \cdot 1 \times 10^{-10} \hat{k} \text{ T}$ 4. $\vec{B} = -4 \cdot 1 \times 10^{-8} \hat{k} \text{ T}$
Options	
A	1
B	2
C	3
D	4

Question ID	12230
Question Type	MCQ
Question	A magnetising field of 1500 Am^{-1} produces a magnetic flux of $2.4 \times 10^{-5} \text{ Wb}$ in a bar of iron having cross-section 0.5 cm^2. The susceptibility of the iron bar is approximately: [Given : $\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1}$] 1. 254 2. 323 3. 382 4. 507
Options	
A	1
B	2
C	3
D	4

Question ID

12231

Question Type

MCQ

Question

Match the **LIST-I** with **LIST-II**

LIST-I (Circuit/Device)		LIST-II (Characteristic)	
A.	Purely resistive circuit	I.	Current leads voltage by $\frac{\pi}{2}$ in phase
B.	Purely inductive circuit	II.	Voltage and current are in phase
C.	Purely capacitive circuit	III.	Voltage leads current by $\frac{\pi}{2}$ in phase
D.	Transformer	IV.	Works on mutual induction

Choose the **correct** answer from the options given below:

1. A-I, B-II, C-III, D-IV

2. A-III, B-II, C-I, D-IV

3. A-II, B-III, C-I, D-IV

4. A-II, B-III, C-IV, D-I

Options

A

1

B

2

C

3

D

4

Question ID	12232
Question Type	MCQ
	An inductor coil joined to a 6 V battery draws a steady current of 12 A. Now this coil is connected in series to a capacitor and an a.c. source of alternating emf 6 V. If the current in the circuit is in phase with the emf, then the rms current is:

Question	1. 6 A 2. 8 A 3. 10 A 4. 12 A
Options	
A	1
B	2
C	3
D	4

Question ID	12233
Question Type	MCQ
Question	If r_1 and r_2 are the radii of the atomic nuclei of mass number 4 and 32, respectively, then the ratio (r_1/r_2) is 1. 1:2 2. 1:3 3. 1:4 4. 1:5
Options	
A	1
B	2
C	3
D	4

Question ID	12234																				
Question Type	MCQ																				
Question	Match the LIST-I with LIST-II																				
	<table><tr><th colspan="2">LIST-I (Electromagnetic waves)</th><th colspan="2">LIST-II (Frequency range (Hz))</th></tr><tr><td>A.</td><td>Radio waves</td><td>I.</td><td>10^4 to 10^8</td></tr><tr><td>B.</td><td>Microwaves</td><td>II.</td><td>10^{18} to 10^{22}</td></tr><tr><td>C.</td><td>Ultraviolet rays</td><td>III.</td><td>10^{16} to 10^{17}</td></tr><tr><td>D.</td><td>Gamma rays</td><td>IV.</td><td>10^9 to 10^{12}</td></tr></table>	LIST-I (Electromagnetic waves)		LIST-II (Frequency range (Hz))		A.	Radio waves	I.	10^4 to 10^8	B.	Microwaves	II.	10^{18} to 10^{22}	C.	Ultraviolet rays	III.	10^{16} to 10^{17}	D.	Gamma rays	IV.	10^9 to 10^{12}
	LIST-I (Electromagnetic waves)		LIST-II (Frequency range (Hz))																		
	A.	Radio waves	I.	10^4 to 10^8																	
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C.	Ultraviolet rays	III.	10^{16} to 10^{17}																		
D.	Gamma rays	IV.	10^9 to 10^{12}																		
Choose the correct answer from the options given below:																					
1. A-II, B-III, C-IV, D-I																					
2. A-II, B-III, C-I, D-IV																					
3. A-I, B-IV, C-II, D-III																					
4. A-I, B-IV, C-III, D-II																					
Options																					
A	1																				
B	2																				
C	3																				
D	4																				

Question ID	12235
Question Type	MCQ
	A light is represented as a plane wave whose electric field is given by $\left \vec{E} \right = 10 \left[\sin \left(5 \times 10^{15} \right) t + \sin \left(4 \times 10^{15} \right) t \right] \text{ V/m; where } t \text{ is in second.}$ It falls on a metal surface having work function 2.0 eV. The maximum kinetic energy of the emitted photoelectrons is:

Question	[Given: the value of Planck's constant is $6.63 \times 10^{-34} \text{ Js}$] 2.3 eV 6.3 eV 1.3 eV 5.3 eV		
Options			
A	1		
B	2		
C	3		
D	4		

Question ID	12236			
Question Type	MCQ			
Question	Match the LIST-I with LIST-II			
	LIST-I (Optical Phenomenon)		LIST-II (Example)	
	A.	Total Internal Reflection	I.	Bending of light at corners
	B.	Refraction	II.	Rainbow formation
	C.	Scattering	III.	Optical fibre
	D.	Diffraction	IV.	Blue sky
Choose the correct answer from the options given below:				
1. A-I, B-II, C-III, D-IV				
2. A-III, B-II, C-IV, D-I				
3. A-III, B-II, C-I, D-IV				
4. A-IV, B-III, C-II, D-I				
Options				
A	1			
B	2			
C	3			
D	4			

Question ID	12237		
Question Type	MCQ		
Question	Arrange the following media in the ascending order of their refractive indices:		
	- Diamond - Silicon - Crown glass - Water		
	Choose the correct answer from the options given below:		
	- A, B, C, D - B, A, C, D - D, C, B, A - D, C, A, B		
Options			
A	1		
B	2		
C	3		
D	4		

Question ID	12238		
Question Type	MCQ		
Question	An object is placed at 5 cm in front of a concave mirror having radius of curvature		
Options			

An object is placed at 5 cm in front of a concave mirror having radius of curvature 15 cm. The nature and position of the image will be:

Question

1. 15 cm behind the mirror; virtual image
2. 15 cm in front of the mirror; real image
3. 15 cm behind the mirror; real image
4. 15 cm in front of the mirror; virtual image

Options

A	1
B	2
C	3
D	4

Question ID 12239

Question Type MCQ

Question

A monochromatic light of wavelength $5000 \text{ \AA}$ is used in a Young's double slit experiment. If the width of 10 fringes on the screen 1 m away is 2 cm, the separation between the two slits is:

1. 0.15 mm
2. 0.25 mm
3. 0.35 mm
4. 0.45 mm

Options

A	1
B	2
C	3
D	4

Question ID 12240

Question Type MCQ

Question

The radius (r) of the path of an electron moving at a speed of v (m/s) in a magnetic field B (T) perpendicular to it, is given by:

[Here symbols have their usual meanings]

1. $r = \frac{eB}{m_e v}$
2. $r = \frac{m_e v}{eB}$
3. $r = \frac{m_e B}{ev}$
4. $r = \frac{m_e e}{Bv}$

Options

A	1
B	2
C	3
D	4

Question ID 12241

Question Type MCQ

A copper wire of cross-sectional area of $4 \times 10^{-8} \text{ m}^2$ carries a current of 2 A. Each copper atom contributes roughly one conduction electron. Identify the CORRECT statements.

[Given: Density of copper (Cu) is $9 \times 10^3 \text{ kg/m}^3$ and atomic mass number of Cu is 64]

Question	A. Number of Cu atoms per cubic metre is approximately 8.4×10^{28} .	
	B. Drift speed of electrons is approximately 3.7 mm s^{-1}	
	C. Dimensions of mobility are $[\text{ML}^3 \text{T}^{-2} \text{A}]$.	
	D. Drift speed of electrons is approximately 1 mm s^{-1}	
	Choose the correct answer from the options given below:	
Options	1. A and B Only	
	2. A, B and C Only	
	3. A, C and D Only	
	4. A and D Only	
A	1	
B	2	
C	3	
D	4	

Question ID		12242
Question Type		MCQ
Question	The energy released in the fission of a single ${}^{235}_{92}\text{U}$ nucleus is 200 MeV. To produce the power of 1 kW, the required number of fissions per second is:	
	1. 3.125×10^{13}	
	2. 6.250×10^{13}	
	3. 7.128×10^{14}	
	4. 8.924×10^{14}	
Options		
	A	
	B	
	C	
	D	

Question ID		12243
Question Type		MCQ
Question	Arrange the following elements in the ascending order of their binding energies per nucleon:	
	A. ${}^{12}\text{C}$	
	B. ${}^{56}\text{Fe}$	
	C. ${}^{100}\text{Mo}$	
	D. ${}^{238}\text{U}$	
Options	Choose the correct answer from the options given below:	
	1. A, D, C, B	
	2. B, C, D, A	
	3. A, C, D, B	
	4. D, A, C, B	
Options		
	A	
	B	
	C	
	D	

Question ID		12244
Question Type		MCQ
Question	If the wavelength of first line of Balmer series of hydrogen is $6561 \text{ \AA}$, Then the limiting wavelength of this series will be	

limiting wavelength of this series will be

Question	1. $9780 \text{ \AA}$ 2. $8857 \text{ \AA}$ 3. $3645 \text{ \AA}$ 4. $4429 \text{ \AA}$
Options	
A	1
B	2
C	3
D	4

Question ID	12245
Question Type	MCQ
Question	The de Broglie wavelength of the electron moving in its first orbit ($n=1$) in hydrogen atom is : 1. 0.66 nm 2. 0.33 nm 3. 0.165 nm 4. 1.06 nm
Options	
A	1
B	2
C	3
D	4

Question ID	12246
Question Type	MCQ
Question	Arrange the following materials in the ascending order of their energy band gap at room temperature: A. Germanium B. Metal C. Silicon D. Diamond Choose the correct answer from the options given below: 1. A, B, C, D 2. B, A, C, D 3. D, C, B, A 4. B, A, D, C
Options	
A	1
B	2
C	3
D	4

Question ID	12247
Question Type	MCQ
Question	A 10 V Zener diode along with a series resistance is connected across a 40 V supply. If the maximum Zener current is 50 mA, then the minimum value of the resistance will be: 1. $300 \text{ }\Omega$ 2. $400 \text{ }\Omega$ 3. $600 \text{ }\Omega$ 4. $680 \text{ }\Omega$

Options	
A	1
B	2
C	3
D	4