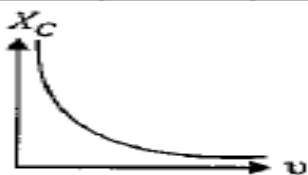


Kendriya Vidyalaya Sangathan, Lucknow Region
Session-2022-23
First Pre-Board Examination
Class-12

Subject-Physics (Theory) **Set-B**

Answer Key

MARKING SCHEME

1	(a) Both are negative	1 Mark
2	(b) Semiconductors increases and of conductors decreases.	1 Mark
3	(d) Both (a) and (b) are correct	1Mark
4	(c)Area of the plate is increased.	1 Mark
5	(c) Energy	1 Mark
6	(d) All of the above	1 Mark
7	(c) change in magnetic flux	1 Mark
8	 (a)	1 Mark
9	(b) They travel at different speeds in vacuum, depending on their frequency.	1 Mark
10	(b) $\lambda = c/f = 7.5 \text{ m}$	1 Mark
11	(c) 1.5	1 Mark
12	(a)Zero	1Mark
13	(a)Frequency of the incident light exceeds a certain minimum value.	1 Mark
14	(d) B & C will have same intensities while A & B will have same frequencies.	1 Mark
15	(a)Zero	1 Mark
16	(a)Both A and R are true and R is the correct explanation of A.	1 Mark
17	(a)Both A and R are true and R is the correct explanation of A.	1 Mark
18	(b)Both A and R are true and R is not the correct explanation of A.	1 Mark
19	Diagram	$\frac{1}{2}$ mark
	Correct formula of Torque and arriving at the correct expression $\tau = pE\sin\theta$	1 Mark
	Orientation of Stable Equilibrium	$\frac{1}{2}$ Mark

20	$E = E_1 r_2 + E_2 r_1 / r_1 + r_2$	½ Mark
	$E = 1.9 \text{ V}$	½ Mark
	$r = r_1 r_2 / r_1 + r_2$	½ Mark
	$r = 0.12 \text{ ohm}$	½ Mark
21	The magnetic dipole moment of a diamagnetic atom is zero whereas the magnetic dipole moment of a paramagnetic atom is not zero	1 Mark
	In case of even number of electrons the magnetic dipole moment is more likely to be cancelled, hence they are more likely to be diamagnetic.	1 Mark
	OR	
	Diagram, Derivation and arriving at correct expression $F = IBL \sin\theta$	1 + 1 = 2 Marks
22	On inserting iron rod , X_L will increase as L increases,	½ Mark
	So, Z also increases (correct formula of Z)	½ Mark
	So, $I = V/Z$ decreases, brightness and hence glow decreases	½ + ½ = 1 Mark
	OR	
	Correct definition	1 Mark
	Correct Unit	½ Mark
	Any one correct factor	½ Mark
23	Micro < UV < X < Gamma [Gamma has the highest frequency]	2 Marks
24	Refraction should be at denser -rarer interface (Light should go from denser to rarer medium)	1 Mark
	Angle of incidence should be greater than critical angle	
25	Correct definition of threshold frequency	1 Mark
	Correct definition of Stopping potential	1 Mark
26	Correct Diagram for outside point	½ Mark
	Correct derivation using Gauss theorem in terms of Q	1 Mark
	Derivation of electric field in terms of σ $E = \sigma R^2 / \epsilon_0 r^2$	½ Mark
	Correct diagram for inside point	½ Mark
	Correct Derivation	1 Mark
	Correct Graph	½ Mark
27	Correct derivation starting from the expression of current in terms of drift velocity $i = neAv_d$, substituting value of $v_d = eV\tau/mL$	1 Mark
	$V/i = mL/ne^2 A\tau = \text{constt (R)}$	1 Mark
	$R = \rho L/A$ & on comparison $\rho = m/ne^2\tau$	1 Mark
	OR	

	Applying Kirchoff's II law in loop ACDA, $R = 3 \text{ ohm}$	1 Mark
	In loop DCBD, $R_1 = 0$, $V_c = 1 \text{ volt}$, $V_B = 1 \text{ V}$ Any correct method (Full Marks)	1 +1 = 2 Marks
28	$mg = \mu_0 2I_1I_2/4\pi r$	1 Mark
	Correct value substitution	1 Mark
	Solution and correct answer $1.2 \times 10^{-3} \text{ kg/m}$	1 Mark
	OR	
	Correct diagram and expression for outside point	1.5 Mark
	Correct diagram and expression for inside point	1.5 Mark
29.	Huygen's Theory	1 Mark
	Diagram	1 Mark
	Proof of Snell's Law	1 Mark
30.	Einstein's Photoelectric equation	1 Mark
	Explanation of three salient features	2 Marks
31	(a)Definition	1 Mark
	(b)Derivation	2 marks
	Calculation and correct answer $4K/K+3$	2 Marks
	OR	
	(a) $C' = KC$ $V' = Q/C' = V/K$ $U' = U/K$ with proper explanation	1+1+1= 3 Marks
	(b) $1/C + 1/C + 1/C = 3/C$	1 Mark
	$3/C = 2$, $C = 6\mu\text{F}$, When connected in parallel, net cap = $18 \mu\text{F}$	$\frac{1}{2}$ Mark $\frac{1}{2}$ Mark
32	Biot- Savart Law (Correct Expression)	1 Mark
	Correct Diagram with components of magnetic field due to current element	1 Mark
	Correct derivation with proper steps	2 Marks
	Correct expression for the magnetic field at the centre	1 Mark
	OR	
	(a)Diagram	1 Mark
	Principle	1 Mark
	(b)Correct Justification	1 Mark
	(c)Conversion of galvanometer into ammeter	1 Mark
	Correct Expression of shunt resistance	1 Mark
33	(a) Correct Diagram	1 Mark
	Correct Derivation	3 Marks
	(b) Correct Answer with explanation	1 Mark
	OR	
	Graph	1 Mark

	Diagram	1 Mark
	Derivation	2 Marks
	Correct formula	½ Mark
	Correct Answer $\sqrt{3}$	½ Mark
34	(i) Two advantages	1 Mark
	(ii) Low cost	1 mark
	(iii) Correct explanation	2 Marks
	OR (iii) Correct explanation	2 Marks
35	(i) Correct Principle	1 Mark
	(ii) 1:1	1 Mark
	(iii) No as if voltage increases, current decrease and vice versa	2 Marks
	OR (iii) Copper loss, hysteresis loss or any two correct answers	2 Marks