Class –XII

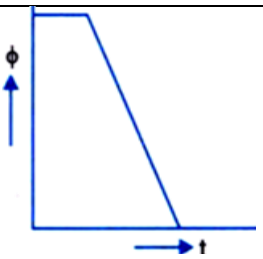
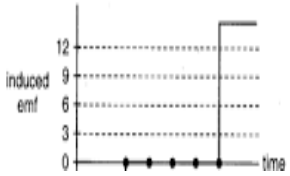
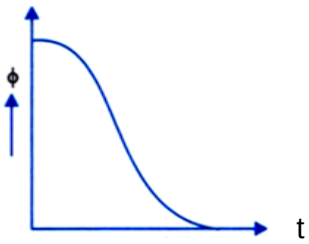
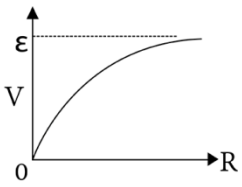
PHYSICS (Theory)

SQP Marking Scheme 2020-21

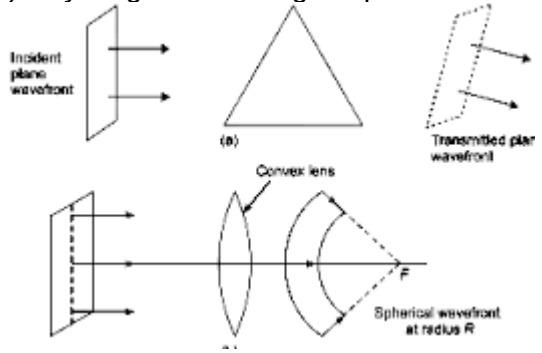
Sr. No.	**VALUE POINTS**	Marks
1	Magnetic dipole moment	1
2	Any one use of micro waves **OR** 1:1	1
3	zero	1
4	Remains same **OR** 7.707A, 50Hz	1 ½+½
5	$h/2\Pi$	1
6	4eV	1
7	Antinutrino **OR** Electron	1
8	Decreases **OR** 25Hz	1
9	Dynamic resistance =change in voltage/change in current=1ohm	1
10	Photodiode	1
11	a) Both A and R are true and R is the correct explanation of A	1
12	b)Both A and R are true and R is the correct explanation of A	1
13	c)A is true but R is false	1

14	b) Both A and R are true but R is NOT the correct explanation of A	1
15	1.c) Copper 2.a) car 3.c) zero 4.a) -q 5 b)1.9×10^5 Nm^2/C leaving the surface (any 4 parts to be attempted)	4x1 = 4
16	1. b) Its critical angle with reference to air is too small 2. a) 2.42 3. c) high refractive index 4. d) increase 5. d) less than first (any 4 parts to be attempted)	4x1=4
17	Explanation by showing magnetic field directions in all three regions Concluding left of region 1	1 1
18	Plot of Intensity distribution of diffraction with proper labeling **OR** $n\lambda/d=2\lambda/a$ n=2d/a ,where d is separation between slit and a width of slit	2
19	Derivation including both terms electrostatic energy in system and in external field **OR** Derivation of relation E=-dV/dr Diagram of equipotential surfaces	1+1 1+1

20	Circuit diagram showing biasing of LED in F.B Action of LED For emission in visible range least band energy required is1.8eV	½ 1 ½
21	Calculation of magnetic flux $\Phi=BA\cos\theta$,where $\theta=30^0$ $=\sqrt{3}/2\text{^}10^{-11}$Wb Calculation of induced emf $E=A\cos\theta dB/dt=0.5V$	1 1
22	Path difference=$3\lambda/2$ Putting value we will getλ=3cm	1 1
23	Well labeled energy band diagram of n-type semiconductor n-type semiconductor electrons-majority charge carriers	1 ½ ½
24	Definition of each term Diagram showing relation **OR** $Bv/B_H=\tan\theta$ Putting values,$\theta=30^0$	½+½ 1 1 1
25	Two characteristics- virtual and enlarged image and same side of object. As u and v both negative, we get 1/v=1/u-1/f Interpret y=mx+c ,plot of the graph	1 1

26	  Induced current and power, sketch is same as shown above. In case of circular coil, rate of change of area of the loop during its passage out of field is not constant, hence induced current varies accordingly. 	½ for each plot 1 ½
27	Circuit diagram  Maximum current drawn will be at R=0 **OR** Circuit diagram Applying correct formula And caluation of p.d=11.5V Series resistor limits the current drawn from source	1 1 1 1 ½ ½ 1

28	De-Broglie reasoned out that nature was symmetrical and two basic physical entities –mass and radiation must be symmetrical.If radiation shows shows dual aspect than matter should do so. De-Broglie equation- $\lambda=h/P$ For photon – $P=h\nu/C$ Therefore,$h/P=C/\nu=\lambda$ As $\lambda=h/\sqrt{2mk}$ So,alpha particle will be having shortest de-Broglie wavelength compared to deutrons. **OR** Main implications- 1. kinetic energy of emitted electrons depends upon frequency,but not on intensisty of radiation 2.there exist a frequency of radiation below which no photoemission takes place, how high intensity of radiation may be. Explanation wave nature of radiation fails to explain photoelectric effect	1 1 1 1 1 1
29	Derivation of frequency of radiation emitted when a hydrogen atom de excites from level n to level (n-1). $\nu = me^4 (2n-1) / (4\Pi)^3 (h/2\Pi)^3 n^2 (n-1)^2$ Comparing for large values of n, with classical freuency $\nu = v / 2\Pi r$	2 1
30	One difference between nuclear fission and nuclear fusion Calculating $Q=((m)\ Fe-2(m)\ Al)C^2 = 26.90MeV$ Justification not possible	1 1 1
31	(a) Statement of Gauss law Proof of outward flux due to a point charge Q ,in vacuum within gaussian surface, is independent of its size and shape (b) Net electric field towards left=σ/ε left Net electric field towards right=σ/ε right	1 2 1 1

	OR	
	Definitionof ideal dipole +example	½+ ½
	Derivation of torque	2
	Putting values in correct formula and solving,value of charge and potential energy	1
	$Q=8\times10^{-3}$ C	1
	U=-8J	
32	(a) Derivation of instantaneous current $i=i_o\sin(\omega t+\Pi/2)$	1
	Reactance $X_C=1/\omega C$	1
	Phasor diagram showing v and i relation in pure C	1
	(b) Explanation that adding R it will behave RC series ac circuit Calcuation of current and phase angie	1+1
	OR	
	(a)Principle of ac generator	1
	(b)Well labelled diagram	1
	Brief working and emf expression	2
	(c) reason	1
33	(a) Definition of wavefront	1
	(b) Ray diagram showing shapes of wavefront  	1 1
	(c) Proof of Snell's law	2

	OR	
	(a) choice of objective	1
	(b) ray diagram of reflecting type telescope Formula of magnifying power	2+1
	(c) stating two advantages	2