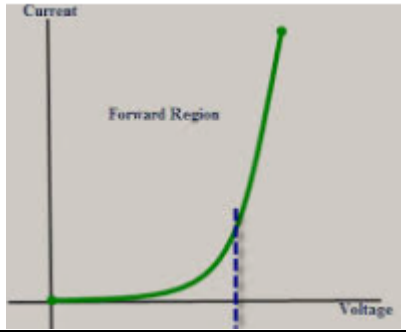
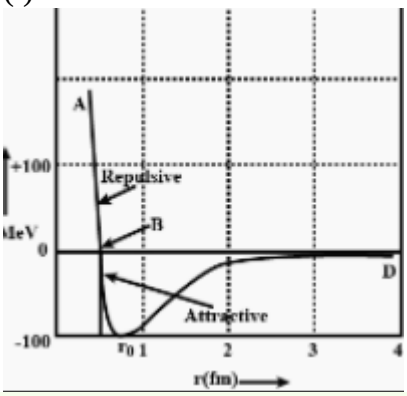
Roll Number		

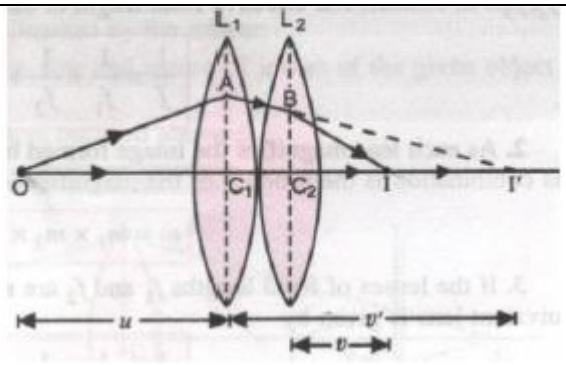
SET C

INDIAN SCHOOL MUSCAT
SECOND PRE - BOARD EXAMINATION
PHYSICS(042)

CLASS: XII TERM 2 Max.Marks: 35

MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
	1	(i) For a given metal and frequency of incident radiation, the number of photoelectrons ejected per second is directly proportional to the intensity of incident radiation. (ii) Maximum kinetic energy of the emitted photo electron is independent of the intensity of incident radiations. (i) Emission of photoelectrons is instantaneous. OR According to Bohr's second postulate $mvr_n = \frac{nh}{2\pi}$ $2\pi r_n = \frac{nh}{mv}$ ut $\frac{h}{mv} = \frac{h}{p} = \lambda$ $2\pi r_n = n\lambda$	Any two (1+1) 1+1
	2	(i) Diffusion, drift (ii) Definition-barrier potential	½+1/2 1
	3	(i) Forward bias (ii)  	1 1

	4	(i)  **(ii)** $R=R_0A^{1/3}$ Ratio=2:5	2 Any two (1/2+1/2)
	5	(i) working principle of a solar cell (ii) three basic processes involved in the generation of emf- explanation (ii) The energy for the maximum intensity of the solar radiation is nearly equals to 1.5 eV. So, to obtain the photo excitation the energy radiation (h ν) must be greater than the energy band gap (E_g). semiconductors with band gaps close to 1.5 eV are ideal materials for the fabrication of solar cells. Since Si and GaAs have band gaps of 1.1 eV and 1.53 eV, they are preferred for making solar cells.	½ 1 ½ 1
	6	(i) $r = n^2 \times 5.3 \times 10^{-11}$ m $\therefore$ Radius of second excited state ($n = 3$) is : $r = (3)^2 \times 5.3 \times 10^{-11}$ m $= 9 \times 5.3 \times 10^{-11}$ m $= \mathbf{4.77 \times 10^{-10}}$ **m** (ii) Kinetic energy, K_e = + T.E. = 13.6 eV Potential energy, P_e = 2 T.E. = 2 (-13.6) = − 27.2 eV (iii) 1. According to Rutherford model, electron orbiting around the nucleus, continuously radiates energy due to the acceleration; hence the atom will not remain stable. As electron spirals inwards; its angular velocity and frequency change continuously; therefore it. will emit a continuous spectrum	1 ½ + ½ ½ +1/2
	7	(i) Radiowaves, IR, visible light, X- ray (ii) k=150π 2 π/λ=150 π λ =1/75m (iii) due to their short wavelength or high frequency OR	1 1 1

		(a) (i)As the slit width is increased, the width of the central maximum will decrease (ii) angular width will remain same (b) any 2 differences between interference and diffraction pattern	1 1 ½+1/2
	8	(i)ray diagram showing the image formation by a compound microscope when the final image is formed at infinity. (ii) so as to have larger angular magnification and magnifying power OR labelled ray diagram of a reflecting type telescope. Any two advantages of reflecting telescope over a refracting telescope.	2 1 2 1
	9	 Obtaining the expression 1/f1 + 1/f2 = 1/F	1 2
	10	(i) No, all the emitted photoelectrons do not have same K.E. The reason is that different electrons are bound with different forces in different layers of metals. More tightly bound electron will emerge with less K.E. (ii) No, kinetic energy of the emitted electrons does not depend on the intensity of incident radiation. (iii)number of emitted photoelectrons depends on intensity of incident radiation provided that energy hv > W	1 1 1
	11	Wavefront definition figure showing the propagation of a plane wave refracting at a plane surface separating two media when light passes from a rarer to a denser medium. verify Snell's law of refraction.	½ 1 1 ½
	12	(i) (c) 90° (ii) (d) All of these (iii) (d) is incident at an angle greater than the critical angle (iv) (b) $n_1 > n_2$ (v) (b) 1.5×10^8 m s^{-1}	1mark each Total 5marks