Roll Number						SET A

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

CLASS: XII   TERM 2   Max.Marks: 35

<table>
<tr><td colspan="4" align="center">MARKING SCHEME</td></tr>
<tr><td>SET</td><td>QN.NO</td><td align="center">VALUE POINTS</td><td>MARKS SPLIT UP</td></tr>
<tr>
<td></td>
<td>1</td>
<td>(i) Reverse bias
(ii)
</td>
<td>1

1</td>
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<tr>
<td></td>
<td>2</td>
<td>(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.
(iii)   Emission of photoelectrons is instantaneous.
<div align="center">OR</div>According to Bohr's second postulate

$$mvr_n = \frac{nh}{2\pi}$$
$$2\pi r_n = \frac{nh}{mv}$$
ut $$\frac{h}{mv} = \frac{h}{p} = \lambda$$
$$2\pi r_n = n\lambda$$</td>
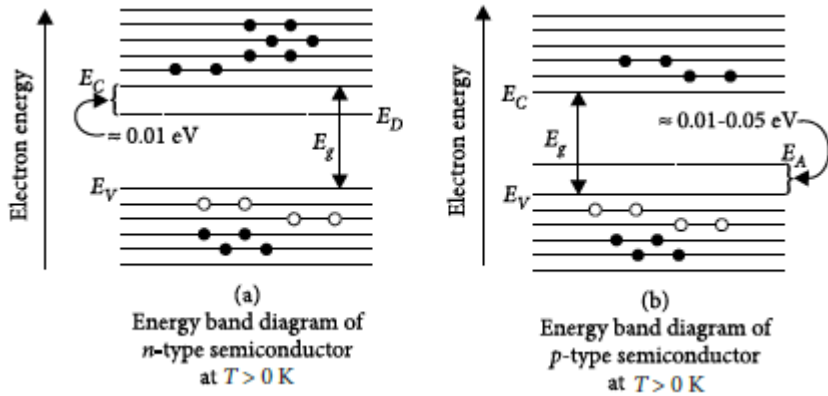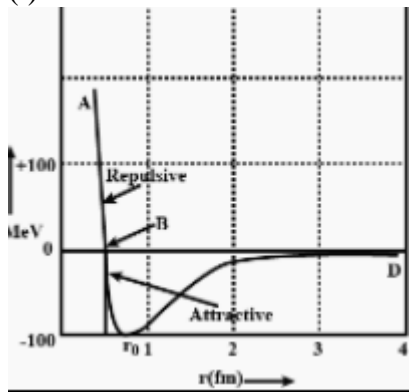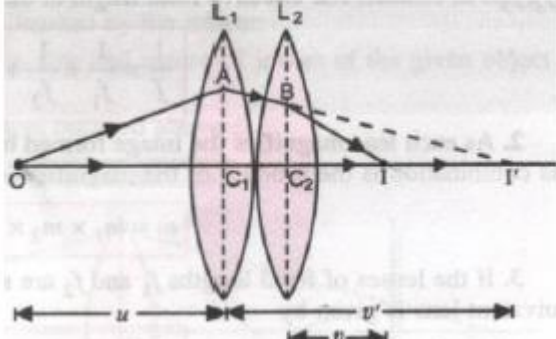<td>Any two (1+1)

1+1</td>
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	3	 (a) Energy band diagram of n-type semiconductor at $T > 0\,K$ (b) Energy band diagram of p-type semiconductor at $T > 0\,K$	1+1
	4	(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 $= 4.77 \times 10^{-10}$ 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. 2. As electron spirals inwards; its angular velocity and frequency change continuously; therefore, it. will emit a continuous spectrum	1 ½ + ½ ½ +1/2
	5	full wave rectifier: 1) circuit diagram 2) working 3) input and output waveforms	1 1 1
	6	(i) **(ii)** R=R₀A^{1/3} Ratio=1:2	2 Any two (1/2+1/2)
	7	Wavefront definition figure showing the propagation of a plane wave refracting at a plane surface	½ 1

		separating two media when light passes from a rarer to a denser medium. verify Snell's law of refraction.	1 ½
	8	(i)ray diagram showing the image formation by a compound microscope when the final image is formed at infinity.	2
		(ii) so as to have larger angular magnification and magnifying power	1
		OR	
		labelled ray diagram of a reflecting type telescope.	2
		Any two advantages of reflecting telescope over a refracting telescope.	1
	9	(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.	1
		(ii) No, kinetic energy of the emitted electrons does not depend on the intensity of incident radiation.	1
		(iii)number of emitted photoelectrons depends on intensity of incident radiation provided that energy $h\nu > W$	1
	10		1
		Obtaining the expression $1/f_1 + 1/f_2 = 1/F$	2
	11	(i) Radiowaves, microwaves, Xray, Gamma ray	1
		(ii) $k=150\pi$ $\quad 2\pi/\lambda=150\pi$ $\quad \lambda =1/75m$	1
		(iii) due to their short wavelength or high frequency	1
		OR	
		(a) (i)As the slit width is increased, the width of the central maximum will decrease	1
		(ii) angular width will remain same	1
		(b) any 2 differences between interference and diffraction pattern	½+1/2
	12	(i) (d) is incident at an angle greater than the critical angle	1mark each
		(ii) (d) All of these	Total 5marks
		(iii)(c) 90°	
		(iv)(b) 1.5×10^8 m s^{-1}	
		(v) (b) $n_1 > n_2$	