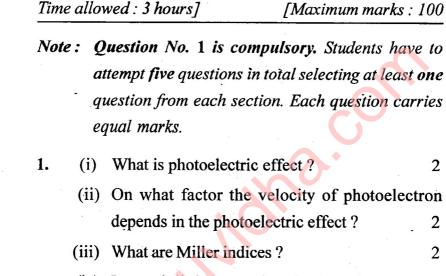
B. Tech Common for all branches 2nd Semester F Scheme Examination,

May-2015

PHYSICS-II

Paper-PHY-102-F



- (iv) In a triclinic crystal, a lattice plane makes intercepts at a length a, 2 b and $\left(\frac{-3c}{2}\right)$. Find the Miller indices of the plane.
- (v) What are Bosons?
- (vi) What are the limitations of classical free electron theory?
- (vii) Name three semiconductors along with values of band gaps.2

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(viii	Explain characteristics of solar cell.	
(ix) Bohr magneton is defined as ?	
(x)) On what factors susceptibility of diar	nagneti
	materials depend?	2
	Section-A	
(a)	Define terms space lattice, unit cell, tra	nslation
	vectors and Miller indices. Also dis	cușs ir
	detail.	8
(b)	What is X-ray diffraction? Discuss Laue	method
	for crystal structure determination.	12
(a)	What is Compton effect? Show that the	change
	in wavelength of the photon is gi	ven by
	$\frac{2h}{mc}\sin^2\frac{\phi}{2}$.	15
(b)	A spectral line has wavelength 4000 Å. C	alculate
	frequency and energy in eV of the	photon
	associated with it.	5
9	Section-B	
Disci	use in detail important fortune CNI	

4. Discuss in detail important features of Nanoparticles.

20



5. The energy expression for the electron in one dimensional potential box is given by



 $En = \frac{\hbar^2}{2m} \left(\frac{n\pi}{L}\right)^2$. Derive the important conclusions from this equation.

Section-C

- 6. (a) Discuss the motion of electrons in a period field of a crystal and show that effective mass of an electron in a crystal is inversely proportional to the second derivative of E-K curve. Under what conditions the effective mass of an electron can become +ve, -ve and infinity.
 - (b) Discuss intrinsic and extrinsic semiconductors. 5
- 7. State the principle of photoconductive cell. Describe its construction working and uses. Show the illuminating characteristics and spectral response.

Section-D

8. (a) Define atomic magnetic moment and discuss orbital diamagnetism.

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(b) Distinguish between dia, para or ferromagnetic substances on the basis of their magnetic susceptibility. How will you explain the difference in their behaviour?

9. Give an account of L angevin's theory of paramagnetism and point out its limitation.