FE Sem 1 Applied Physics I (R-2012)

- **Total 6 Questions of 15 marks each**
- Q-1 Compulsory. Will contain 7 bits of 3 marks each.
- Solve any **Three** from (Q-2 to Q-6)

Question		Marks	Unit No.
Q-1	a	3	1.1
	b	3	2.2
	c	3	2.4
	d	3	3.1
	e	3	3.2
	f	3	4.1
	g	3	4.2
Q-2	a	8	2.1
	b	7	1.1
Q-3	a	8	3.2
	b	7	1.2
Q-4	a	5	1.1
	b	5	2.2
	c	5	3.1
Q-5	a	5	1.1
	b	5	2.3
	c	5	4.1
Q-6	a	5	1.3
	b	5	2.4
	c	5	4.2

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Content Wise Blueprint

Module No.	Unit No.	Unit Title (and contents)	Unit wise Marks*	Module wise total marks*
01	1.1	Crystallography: Space lattice, Unit Cell, Lattice parameters, Bravais lattices and Crystal systems, Cubic crystal system & lattices; Density & Packing Fraction; Miller indices of crystallographic planes & directions; inter-planar distance; Diamond structure, NaCl structure, HCP structure, BaTiO3 structure; Ligancy and Critical radius ratio;	20	32
	1.2	Determination of crystal structure using X-ray diffraction techniques viz. Laue method, rotating crystal method (Bragg method) & powder method;	07	
	1.3	Real crystals & point defects; photonic crystals; Liquid crystal phases and application in LCD	05	

02	2.1	**Semiconductors:** from energy bands of solids and classification of solids; Concepts of holes, effective mass; drift mobility and conductivity in conductors, intrinsic semiconductors and extrinsic semiconductors	08	28
	2.2	Fermi-Dirac distribution function and Fermi energy level in a conductor, insulator, intrinsic & extrinsic semiconductor; Effect of impurity concentration and temperature on the Fermi Level	07	
	2.3	Hall Effect (applied electric field along x-axis and applied magnetic field along z-axis) and its application.	05	
	2.4	Drift and Diffusion of charge carriers to photovoltaic solar cells (refer syllabus)	08	
03	3.1	Dielectric Materials	08	20
	3.2	Magnetic Materials	12	
04	4.1	Acoustics	08	16
	4.2	Ultrasonics	08	
		Grand Total		96#

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