END TERM EXAMINATION

SECOND SEMESTER [B.TECH] MAY-JUNE 2016 Paper Code: ETPH 104

Subject: Applied Physics-II (Batch 2013 Onwards)

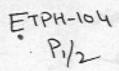
Time: 3 Hours

Maximum Marks:75

Note: Attempt any five questions including Question NO. 1which is compulsory. Select one question from each units. Symbols have their usual meaning. Scientific calculator is allowed.

Q1	. At	are gradient of a vactor
		$A = (x^{2} - xy + z)\hat{i} + (x^{3} - xz + x)\hat{i} + (y^{2} - y + z)\hat{i}$
	b)	
	c)	Write the expression of gradient in spherical coordinates. (2) Give the expression of Gauss's law for
	d)	differential and integral form
		fields? (2)
	e)	write the expression for general wave equation. Show how it
	1)	Calculate the value of ways in . (2)
	g)	State the significance of normalization of a wave function. (2) Are energy levels of a particle in a few of a wave function. (2)
	h)	appropriate equation
	i)	What thermodynamic statistics do electron follow, Bose-Einstein, or Fermi Dirac?
	j)	Draw the plane in a unit cube represented by the miller indices (110).
	k)	A p-type semiconductor back (2)
	1)	State Bloch Theorem. (3)
		(2)
)2.	a)	Show that that
	101	Show that the trajectory of motion of a charged particle in crossed
	b)	electric and magnetic fields (constant) is a cycloid. (6)
		What is skin depth in electromagnetic? Does it depend upon the Write the Margrell and agreed radiation? (2.5)
	c)	Write the Maxwell equations in diff. (2.5)
		Write the Maxwell equations in differential form and state their significance. (2.5)
2		(4)
3.	a)	An electric field in a region is given by E= -3i +4j -5k. Calculate the electric flux through the surface S= 2.0 V10.5
	1.1	the electric flux through the surface S= 2.0 X10-5m ² . (2.5)
	b)	Condition Companion Deck
	0)	current and displacement current.
	c)	II the earth receives 20 cal/min/
	d)	amplitudes of electric and magnetic fields of radiation? (4)
	-,	
		area about 10-6 cm ² . Find the <i>Poynting vector</i> . (2)
		(4)

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Q4.	a)	Using the uncertainty principle show that an electron does not
		The state of the s
	.b)	Describe Davission-Germer experiment. Find the lowest energy in
	et /k	in one differentiational box of length a =0.2nm. (6)
	c)	The eigenfunction of an operator $\frac{d^2}{dx^2}\psi(x) = e^{\alpha x}$. Find the
		corresponding eigen value. (2.5)
Q5.	a)	What type of statistics shall be application for a gas of photon? Justify your answer.
	b)	Compare the qualitative features of Mayoral D. L. (2.5)
	-	The state of the business of the bosic of the bosic of the state of th
	c)	Description and a second secon
		Boltzamann statistics at high temperature. (4)
- 4		field to feel the season for the straint discovery through the
		Unit-III
Q6.	a)	Chromium has structure. It has atomic radius is 0 105
	1	The state of the s
	p)	Describe with a proper diagram the following to
	-1	1 - Contains to Contain all the contains the
	c)	Deduce the Willer indices of a plane which cute of :
	d)	The same of the same same
	ω,	What is the difference between (111) and <111> for miller indices. (2.5)
Q7.	a)	
	0	Define the following (a) Unit Cell (b) Primitive Cell (c) Primitive Lattice (d) Bravis Lattice.
	b)	Germanium crystallizes in diamond form structure with a
		per unit cell. If lattice constant is 5.62 Angstrom, calculate the
		devices of definationing.
	c)	Write short notes on (a) Point Defect (b) Frenkel Defect
		(c) Schottky Deffect. (6)
		<u>Unit-IV</u>
08.	a)	Describe Kronig Pennou Madal
	b)	Describe Kronig-Penney Model. Define law of mass action for a semiconductor. (4)
-54	c)	How does the location of Fermi level change with doping of a
		Schilduddor.
		stan size (6)
Q9.	a)	Derive the expression for Hall coefficient. (4)
	b)	What are Brillouin zones?
	c)	Show that the Fermi energy lies midway between the conduction
		Could still valdiffe Dalli for an intrincio comicon de la
		(6)

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