CONTINUOUS INTERNAL EVALUATION– 3

Dept: FY	Sem/Div: II/D,E,F	Sub: Engineering Physics	S Code:18PHY22
23/09/2021	Time: 3- 4:30pm	Max Marks: 50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

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QN		Questions	Marks	RBT	COs
		PART A			
1	a	Give the assumptions of Quantum Free Electron Theory. Discuss two success of quantum free electron theory	10	L2	CO4
	b	Define internal field. Mention the expression for internal field for one dimension, for three dimensional and Lorentz field for dielectrics. Derive Clausius-Mosotti equation	10	L1&L2	CO4
	c	Calculate the probability of an electron occupying an energy level 0.02eV above the Fermi level at 200K and 400K in a material	5	L3	CO4
		OR			
2	a	What is Hall Effect? Obtain the expression for Hall coefficient, and express Hall voltage in terms of Hall coefficient.	10	L1&L2	CO4
	b	Define Fermi energy, Fermi factor and Fermi velocity. Explain the variation of Fermi factor with temperature	10	L1&L2	CO4
	c	The resistivity of intrinsic germanium at 27^0C is equal to 0.47 ohm-m. Assuming the electron and hole mobilities as 0.38 and 0.18m^2/V-sec respectively. Calculate the intrinsic carrier density	5	L3	CO4
		PART B			
3	a	State and explain Hooke's law. Explain the nature of elasticity with the help of stress-strain diagram	10	L2	CO1
	b	What are torsional oscillations? Mention any two applications of torsional pendulum. Derive the expression for couple per unit twist of a solid cylinder.	10	L1&L2	CO1
	c	Calculate the torque required to twist a wire of length 1.5m, radius $0.0425x10^{-2}$m through an angle of (π/45) radians, if the value of rigidity modulus of the material is $8.3x10^{10}$N/m^2.	5	L3	CO1
		OR			
4	a	Define bending moment. Derive the expression for bending moment in terms of moment of inertia.	10	L1&L2	CO1
	b	What are the types of Elastic moduli? Derive the relation between Y, n and σ where the symbols have their usual meaning.	10	L2	CO1
	c	Calculate the force required to produce an extension of 1mm in steel wire of length 2m and diameter 1mm (Young's modulus for steel Y=$2x10^{11}$ N/m^2	5	L3	CO1

Prepared by: Ms. Thejaswini L P

HOD: Prof. Ramananda Kamath M