

CRM08

Rev 1.10

<BS>

<03/04/2021>

CONTINUOUS INTERNAL EVALUATION - 3

Dept: FY	Sem/Div: I/A,B,C	Sub: Engineering Physics	S Code: 18PHY12
07/04/2021	Time: 3-4:30pm	Max Marks: 50	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

QN	Questions	Marks	RBT	CO's
PART A				
1	a State and explain Hooke's Law. Explain the nature of elasticity with the help of stress-strain diagram	10	L2	CO1
	b Derive the relation between bulk modulus (K), Young's modulus (Y) and σ .	10	L2	CO1
	c Calculate the force required to produce an extension of 1mm in steel wire of length 2m and diameter 1mm. ($Y=2 \times 10^{11} \text{N/m}^2$)	5	L3	CO1
OR				
2	a Define Young's modulus of materials. Derive an expression for the Young's modulus of a beam using single cantilever method	10	L1 & L2	CO1
	b What are the types of Elastic moduli? Mention various types of beams and their engineering applications	10	L1 & L2	CO1
	c Calculate the torque required to twist a wire of length 1.5m, radius $0.0425 \times 10^{-2} \text{m}$ through an angle of $(\pi/45)$ radians, if the value of rigidity modulus of the material is $8.3 \times 10^{10} \text{N/m}^2$.	5	L3	CO1

PART B

3	a	Give the assumptions of quantum free electron theory. Discuss two success of quantum free electron theory	10		
	b	Define internal field in case of solid dielectrics. Derive Clausius-Mossotti equation	10	L1 & L2	
	c	The intrinsic charge carrier concentration of germanium is $2.4 \times 10^{19}/m^3$, calculate its resistivity if mobility of electrons and holes respectively are $0.39m^2/Vs$ and $0.19m^2/Vs$.	5	L3	CO4

OR

4	a	What is Hall Effect? Obtain the expression for Hall voltage in terms of Hall co-efficient.	10	L1 & L2	CO4
	b	What is Fermi Energy? Derive an expression for Fermi Energy at zero Kelvin for a metal	10	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

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