CONTINUOUS INTERNAL EVALUATION- 1

Dept: EC	Sem / Div: 3 A & B	Sub: Electronic Devices	S Code: 18EC33
Date: 20-10-2020	Time: 9:30-11:00 am	Max Marks: 50	Elective:N
Note: Answer any 2 full questions, choosing one full question from each part.			

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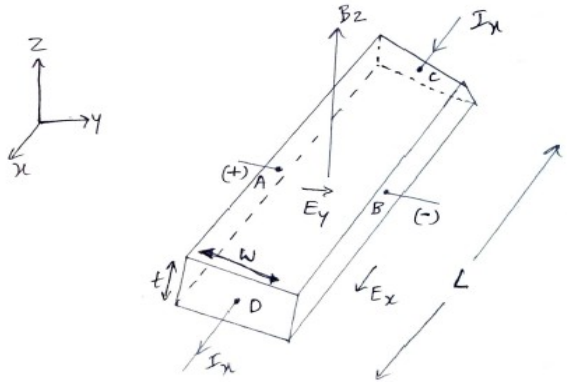
QN		Questions	Marks	RBT	COs
		PART A			
1	a	What are direct and indirect band gap semiconductors? Explain with examples.	8	L2	CO1
	b	Find the conductivity of the intrinsic germanium at 300k, if a donor type impurity is added to the extent of 1atom/10^7 Germanium atom. Assume u_n=3800, u_p=1800, n=2.5x10^3, Q =1.602x10^{-19}	8	L3	CO1
	c	Explain the mechanism of Avalanche breakdown.	9	L2	CO2
		OR			
2	a	Explain the qualitative description of current flow at pn junction under equilibrium and biased condition.	9	L2	CO2
	b	Calculate the value of resistivity of intrinsic silicon at room temperature.	7	L3	CO1
	c	Explain classification of material based on conductivity and energy band diagram.	9	L2	CO1
		PART B			
3	a	What are the types of bonding forces in solids? Explain.	8	L2	CO1
	b	Calculate the intrinsic carrier concentration in Silicon at room temperature T=300k, where B is the material dependent parameter 5.4x10^{31} and Eg is the bandgap energy 1.12eV, and K is the Boltzman constant 8.62x10^{-5} eV/K.	8	L3	CO1
	c	Discuss the piecewise linear approximations of pn diode under ideal condition.	9	L2	CO2
		OR			
4	a	With a neat diagram explain the I-V characteristics of a pn junction.	9	L2	CO2
	b	Distinguish between Zener breakdown and avalanche breakdown.	7	L3	CO2
	c	 Consider a semiconductor bar with w = 0.1 mm, t = 10 um, and L = 5 mm. For B = 10 kG in the z-direction (1 kG = 10^{-5} Wb/cm^2), V_{CD} = 100mV and a current of 1 mA, we have V_{AB} = -2 mV. Find the type, concentration, and mobility of the majority carrier.	9	L3	CO1