CONTINUOUS INTERNAL EVALUATION- 1

Dept: **FY**	Sem / Div: **2 A B C**	Sub: **Basic Electronics**	S Code: **18ELN24**
Date: 26.06.2021	Time: 9:30-11:00	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	Explain the working of PN-junction diode under forward and reverse biased conditions.	9	L2	CO1
	b	Explain the working of half-wave rectifier with capacitor filter with neat circuit diagram and wave-forms.	9	L2	CO1
	c	A full-wave rectifier uses two diodes having internal resistance of 20 Ω each. The transformer rms secondary voltage from centre to each end is 50 V. Find *Vm*, *Im*, *Idc*, *Vdc* and *Irms* if the load is 980 Ω.	7	L3	CO1
		OR			
2	a	What is Zener diode? With neat circuit diagram, explain the operation of Zener diode voltage regulator with and without load?	9	L2	CO1
	b	Explain Photo-diode, LED and Photo-coupler. Give minimum two applications of each.	9	L2	CO1
	c	A half wave rectifier is fed from a supply of 230 V, 50 Hz with step down transformer of ratio 3:1. Resistive load connected is 2 kΩ. The diode forward resistance is 50 Ω and transformer secondary is 10 Ω. Calculate the DC load current and DC load voltage.	7	L3	CO1
		PART B			
3	a	Explain construction, working and characteristics of N-channel JFET.	9	L2	CO2
	b	Explain CMOS as an Inverter with neat circuit diagram. Give its equivalent circuit and its advantages.	9	L3	CO2
	c	For a JFET, (i) $I_{DSS} = 9mA$ and $V_{GS(off)} = -8V$ (max); determine drain current for $V_{GS} = -4V$. (ii) $I_{DSS} = 10\ mA$ and drain current 5 mA. If $V_{GS(off)} = -6\ V$; calculate the value of V_{GS} *and* V_T. (ii) I_{GSS} of $-2\ nA$ for $V_{GS} = -20\ V$. Determine the input resistance.	7	L3	CO2
		OR			
4	a	Explain the construction, working and characteristics of N-channel depletion MOSFET.	9	L2	CO2
	b	Explain the working of SCR using two-transistor model.	9	L3	CO2
	c	For an E-MOSFET, determine the value of I_D, if $I_{D(on)} = 4mA$, $V_{GS(on)} = 6V$, $V_T = 4V$ and $V_{GS} = 8V$.	7	L3	CO2