Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Third Semester

Biomedical Engineering

BM3353 - Fundamentals of Electronic Devices and Circuits

Regulations - 2021

Duration : 3 Hrs ***Maximum : 100 Marks***

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Define an Intrinsic Semiconductor. Why it is not suitable for practical use?	L2	1	2
2.	A silicon diode has a saturation current of 6.5 µA at room temperature 400°K. calculate the saturation current at 500 °K.	L3	1	2
3.	Give the relation between operating regions and biasing of transistor junctions.	L2	2	2
4.	List the benefits of h parameter model.	L1	2	2
5.	Sketch the transfer characteristics of N-Channel JFET with VGS equation.	L2	3	2
6.	Find the amplification factor for FET, assume r_d = 5 KΩ and g_m = 6 m A/V.	L3	3	2
7.	How FINFET is differ from MESFET? Justify.	L2	4	2
8.	How Zener is differing from a PN junction? Give some examples.	L2	4	2
9.	What will be the effect of temperature on solar cell?	L2	5	2
10.	Draw the structure of TRIAC and it is equivalent circuit.	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Discuss the working mechanism of PN junction diode with both forward and reverse characteristics and also explain the complete VI Characteristics of a diode.	L2	1	16
		Or			
	b i	Derive the expression for Diffusion capacitance of a diode and also explain its switching characteristics.	L2	1	8
	ii	Explain the mechanism of drift current and justify how it is differing from diffusion current?	L2	1	8
12.	a i	Construct and demonstrate the working mechanism of N-P-N, P-N-P Transistor and Show how the voltage sources are connected to the transistor with respect to CE Configuration?	L3	2	10
	ii	Obtain the expression of Ebers moll model for an NPN transistor with neat sketch.	L3	2	6
		Or			

	b	i	Draw and analyze the output characteristics of CE configuration of a transistor.	L3	2	8
		ii	Compare CE,CC and CB configurations of a transistor and justify why CE is best among all the other configurations and most widely used in amplifier circuits.	L3	2	8
13.	a		Discuss your understanding about MOSFET and detailing the n channel and P channel depletion types along with its characteristics.	L3	3	16
			Or			
	b	i	Design with suitable sketch of N Channel E- MOSFET with its characteristics.	L3	3	8
		ii	Give the comparison between BJT and MOSFET with suitable parameters.	L3	3	8
14.	a		Discuss the structure of Metal semiconductor junction and sketch the energy band diagrams for forward and reversed biased conditions.	L4	4	16
			Or			
	b		Design and discuss the working principle of MESFET and FINFET, justify which is better suitable for low power digital circuits?	L4	4	16
15.	a		Discuss and design the schematic for UJT and along with that discuss its characteristics, equivalent circuit and intrinsic standoff ratio.	L4	5	16
			Or			
	b		Design and discuss the construction of SCR and how the same device can be used in two transistor model?	L4	5	16