BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATIONMO/2024)

CLASS: BTECH **SEMESTER : V**
BRANCH: EEE **SESSION : MO/2024**

SUBJECT: EE357 ELECTRONIC DEVICES AND ANALOG CIRCUITS

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Explain drift and diffusion currents in semiconductors.	[2]	1	2
Q.1(b)	Illustrate the working of a PN junction diode. The voltage across a Silicon diode at room temperature of 300°K is 0.7 V when 2 mA of current flows through it. If the voltage increases to 0.75 V, calculate the diode current when the voltage equivalent of temperature V_T =26 mV =0.026 V.	[3]	1	2
Q.2(a)	Draw V-I characteristics of Zener diode and discuss its operation	[2]	1	1
Q.2(b)	Explain the operation of half-wave Rectifier with the help of circuit diagram and neat waveforms. If the output voltage of a centre tap full-wave rectifier and a bridge type full wave rectifier is 100 V, determine the peak inverse voltage in both the cases.	[3]	1	3
Q.3(a)	Explain Base-width Modulation Effect in BJT using suitable diagram.	[2]	2	2
Q.3(b)	Describe the term transistor biasing? What are the factors that affect the bias stability of a transistor? A transistor operating in CB configuration has I_C = 2.98 mA, I_E = 3 mA and I_{CO} = 0.01 mA. What current will flow in the collector circuit of this transistor when connected in CE configuration with a base current of 30 μA?	[3]	2	4
Q.4(a)	What is a MOSFET? How many types of MOSFETs are there? A FET has Drain Saturation Current I_{DSS} of 10 mA and Quiescent point Drain Current I_D is 5 mA with pinch-off voltage V_P = -4 V. Calculate the value of V_{GS}.	[2]	2	4
Q.4(b)	With suitable diagram explain the construction and working of n-channel JFET. Draw and explain its static characteristics curve.	[3]	2	2
Q.5(a)	What is intrinsic stand- off ratio and interbase resistance of a UJT?	[2]	2	1
Q.5(b)	Describe the construction and characteristics of UJT with a neat sketch.	[3]	2	2

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