

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-I & II(NEW) EXAMINATION – WINTER 2022

Subject Code:3110016

Date:16-03-2023

Subject Name:Basic Electronics

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Define between insulator, conductor and semiconductor.	03
	(b) What is Zener breakdown? What is avalanche breakdown? Compare both the type of breakdown.	04
	(c) Explain full wave bridge rectifier with neat diagram.	07
Q.2	(a) Design and explain basic NAND gate using DTL logic.	03
	(b) Discuss different types of diodes. Describe process of testing diode with multi meter.	04
	(c) Write a short note: V-I characteristic of P-N junction diode.	07
OR		
	(c) Why biasing is important in transistor? Explain voltage divider bias with diagram.	07
Q.3	(a) Explain about DC load line of transistor.	03
	(b) Explain PIN photo diode.	04
	(c) Draw and explain input and output characteristic of transistor in common emitter configuration.	07
OR		
Q.3	(a) What is varactor diode? How capacitance of a diode varies with reverse voltage?	03
	(b) Explain the selection of a Q point for a transistor bias circuit and discuss the limitations on the output voltage swing.	04
	(c) Compare CB and CC configuration with respect to different transistor characteristics.	07
Q.4	(a) Draw voltage multiplier circuit.	03
	(b) Explain (i) Unipolar device (ii) Transconductance.	04
	(c) Explain application of transistor as a switch.	07
OR		
Q.4	(a) Explain FET as an Amplifier.	03
	(b) Explain why NAND and NOR gate are called universal gate?	04
	(c) Explain the Depletion region and drain characteristics of n channel JFET.	07
Q.5	(a) Among TTL and CMOS digital logic family which one is better and why?	03
	(b) Draw and explain the self-bias circuit of FET.	04
	(c) Write a short note: E-Type MOSFET.	07
OR		
Q.5	(a) Derive the relation between current gain α and β .	03
	(b) What are the advantages of N-Channel MOSFET over P-Channel	04

MOSFET?

(c) Draw symbol and explain truth table of all basic logic gates.

07

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