Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–III (NEW) EXAMINATION – WINTER 2020

Subject Code:3134104 Date:05/03/2021

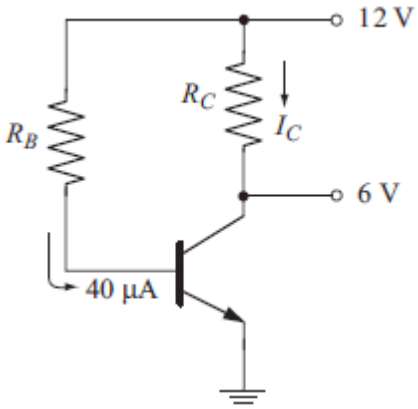
Subject Name:Electronic Devices and Circuits

Time:10:30 AM TO 12:30 PM Total Marks:56

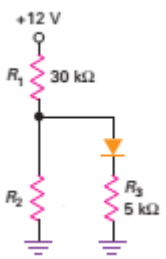
Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	**(a)**	What is doping in semiconductor material?	**03**
	(b)	How the depletion layer is formed in unbiased diode?	**04**
	(c)	Draw half wave rectifier circuit. Draw waveform for voltage across diode, diode current with R and RC load.	**07**
Q.2	**(a)**	Compare Zener Diode and PN junction Diode.	**03**
	(b)	Write a short note on Varactor diode.	**04**
	(c)	Explain capacitive filter with Ripple Factor.	**07**
Q.3	**(a)**	Explain transistor construction with size and doping level of each region.	**03**
	(b)	Differentiate FET and BJT.	**04**
	(c)	For the fixed-bias circuit shown, determine (i) Collector current, I_C (ii) Collector resistance, R_C (iii) Base resistance, R_B (iv) VCE. Assume $\beta = 80$ and $V_{BE} = 0.7$ V.	**07**



Q.4	**(a)**	How transistor act as a switch? What are limitations?	**03**
	(b)	Draw V-I characteristics of Zener diode.	**04**
	(c)	What value should R2 be in figure below to set up a diode current of 0.25 mA? Consider V_D=0.7v	**07**



Q.5	**(a)**	Describe the purpose of cascading CE and CC amplifiers.	**03**
	(b)	Explain the T Model of a transistor.	**04**
	(c)	Explain the voltage divider bias circuit in detail.	**07**
Q.6	**(a)**	What is the use of Heat Sinks in power amplifier?	**03**
	(b)	Explain the difference of class A and class B operation of an amplifier.	**04**
	(c)	Draw and explain class B push-pull amplifier.	**07**
Q.7	**(a)**	List the advantages of Negative feedback.	**03**
	(b)	Describe JFET applications as analog switch.	**04**
	(c)	Explain Darlington pair connections of two transistors.	**07**
Q.8	**(a)**	Summarize all four negative feedback amplifier with input output resistance and voltage gain.	**03**
	(b)	Compare FET with BJT.	**04**
	(c)	Explain construction, operation and characteristic of P-channel Enhancement type MOSFET in detail.	**07**

****