Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE –SEMESTER 1&2(NEW SYLLABUS)EXAMINATION- WINTER 2018

Subject Code: 3110016 Date: 08-01-2019

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.**

			Marks
Q.1	**(a)**	Explain V-I characteristic of tunnel diode.	**03**
	(b)	What is zener breakdown? What is avalanche breakdown? Compare both the type of breakdown.	**04**
	(c)	Write a short note: V-I characteristic of P-N junction diode.	**07**
Q.2	**(a)**	Design and explain basic NAND gate using DTL logic.	**03**
	(b)	Explain following gate using their truth table, logic symbol and equation. Ex-NOR, NAND, NO	**04**
	(c)	Draw and Explain bridge rectifier. Explain advantage and disadvantage of bridge rectifier over full wave rectifier.	**07**
		OR	
	(c)	Write a short note: Biased clipper circuit.	**07**
Q.3	**(a)**	Derive the relation between current gain **α** and **β**	**03**
	(b)	What is DC load line? Explain with necessary diagram.	**04**
	(c)	Draw and explain input and output characteristic of transistor in common emitter configuration.	**07**
		OR	
Q.3	**(a)**	What is stability factor? Explain.	**03**
	(b)	Give comparison between CE, CB and CC configuration of transistor.	**04**
	(c)	What are the different method for biasing the transistor. Explain any two method with necessary circuit diagram.	**07**
Q.4	**(a)**	Why biasing circuits are required?	**03**
	(b)	Explain why NAND and NOR gate are called universal gate?	**04**
	(c)	Explain application of transistor as a switch.	**07**
		OR	
Q.4	**(a)**	List out the salient feature of emitter follower.	**03**
	(b)	Explain various properties of CB amplifier.	**04**
	(c)	Draw and explain the transistor a.c. equivalent circuit.	**07**
Q.5	**(a)**	Give comparison of BJT and JFET.	**03**
	(b)	Draw and explain the self bias circuit of FET.	**04**
	(c)	Draw and explain various characteristic of JFET	**07**
		OR	
Q.5	**(a)**	What are the advantage of N-Channel MOSFET over P-Channel MOSFET.	**03**
	(b)	Explain the application of FET as a buffer amplifier.	**04**
	(c)	Write a short note: E-Type MOSFET	**07**

Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– I & II (NEW) EXAMINATION – WINTER 2019

Subject Code: 3110016 **Date: 06/01/2020**

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.**

			Marks
Q.1	**(a)**	Draw the circuit diagram of Half wave rectifier.	**03**
	(b)	Explain the bridge rectifier with diagrams.	**04**
	(c)	Determine the Vo for the network shown in figure 1	**07**

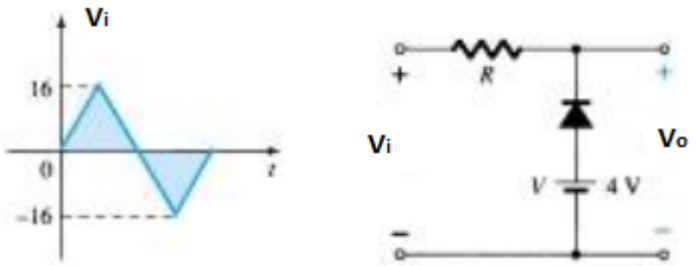

Figure 1

Q.2	**(a)**	Explain Varactor diode and varistor.	**03**
	(b)	Why Zener diode can be used as voltage regulator? Explain Zener as voltage regulator with necessary diagram	**04**
	(c)	Compare the logic families and explain any one of them.	**07**
		OR	
	(c)	Explain Ex-OR and Ex- NOR gate with truth table and construct OR gate using diodes.	**07**
Q.3	**(a)**	Explain about DC load line and Bias point of transistor	**03**
	(b)	Explain the working of PIN Diode.	**04**
	(c)	Briefly explain the h-parameters and draw h-parameter based equivalent circuit for CE transistor and derive equation for input impedance, output impedance and voltage gain.	**07**
		OR	
Q.3	**(a)**	Write truth table of AND, NAND and NOR gates.	**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)	Explain the difference between clipping and clamping circuit. A positive voltage clamping circuit and a positive voltage clipping circuit each have ±12 V square Wave input. Sketch the output waveform for each circuit.	**07**
Q.4	**(a)**	Draw voltage multiplier circuit.	**03**
	(b)	Explain Transconductance and switching in FET.	**04**

	(c)	Explain the Depletion region and drain characteristics of n channel JFET.	**07**

OR

Q.4	**(a)**	Discuss about VI characteristic of Ideal Diode.	**03**
	(b)	Explain FET as an Amplifier.	**04**
	(c)	Determine the voltage Vo for the network of Figure 2. Give explanation for your answer.	**07**

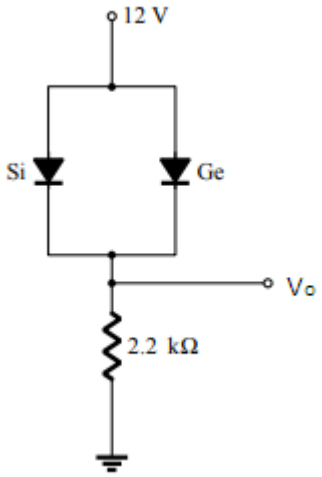

Figure 2

Q.5	**(a)**	Explain the working of Transistor as Switch	**03**
	(b)	Write a short note on E MOSFET as an Amplifier.	**04**
	(c)	Design a series noise clipping circuit which rectify the noise signal with amplitude lower than $\pm V_F$.	**07**

OR

Q.5	**(a)**	Explain the AC load line of transistor.	**03**
	(b)	Draw and explain seven segment display.	**04**
	(c)	Compare BJT with FET and explain D MOSFET.	**07**

****

Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–I &II (NEW) EXAMINATION – SUMMER-2019

Subject Code: 3110016 Date: 07/06/2019

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.**

			Marks
Q.1	**(a)**	Differentiate between insulator, conductor and semiconductor	**03**
	(b)	Explain forward bias PN junction diode with diagram	**04**
	(c)	Explain full wave bridge rectifier with neat diagram	**07**
Q.2	**(a)**	Explain LED diode	**03**
	(b)	State different types of diodes. Describe process of testing diode with multi meter.	**04**
	(c)	What is break down diode?? Explain working of zener break down and avalanche break down	**07**
		OR	
	(c)	Why biasing is important in transistor? Explain voltage divider bias with diagram.	**07**
Q.3	**(a)**	What is use of coupling and bypass capacitor?	**03**
	(b)	Explain PIN photo diode	**04**
	(c)	Draw the circuit of transistor in CE configuration. Sketch the output characteristics and explain active, saturation and cutoff regions	**07**
		OR	
Q.3	**(a)**	What is varactor diode? How capacitance of a diode varies with reverse voltage?	**03**
	(b)	Explain AC loadline with respect to BJT	**04**
	(c)	Compare CE, CB and CC configuration with respect to different transistor characteristics	**07**
Q.4	**(a)**	What is FET? State important features of FET.	**03**
	(b)	Compare BJT and FET	**04**
	(c)	Write short note on MOSFET.	**07**
		OR	
Q.4	**(a)**	Explain clipping circuit	**03**
	(b)	Explain (i) Unipolar device (ii) Transconductance	**04**
	(c)	Write shortnote on JFET	**07**
Q.5	**(a)**	Draw the symbol of NPN and PNP transistor. What is use of transistor?	**03**
	(b)	Among TTL and CMOS digital logic family which one is better and why?	**04**
	(c)	Draw symbol and explain truth table of all basic logic gates	**07**
		OR	
Q.5	**(a)**	State advantage of transistor	**03**
	(b)	Explain (i)universal gate (ii) EX-OR logic gate	**04**
	(c)	Give comparison between different types of digital logic families	**07**

****

Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–I & II(NEW)EXAMINATION – SUMMER 2022

Subject Code:3110016 Date:24-08-2022

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)**	What is a diode? Write its types and applications.	**03**
	(b)	Explain the diode V-I characteristics of ideal and practical PN junction semiconductor diode.	**04**
	(c)	Enumerate the different types of clipping circuits with their different names and input-output waveforms.	**07**
Q.2	**(a)**	Why are junction transistors called bipolar devices?	**03**
	(b)	The metal lead of the p-side of a p–n diode is soldered to the metal lead of the p-side of another p–n junction diode. Will the structure form an n–p–n transistor? If not, why?	**04**
	(c)	Sketch the circuit of the common collector mode of BJT and its output characteristics. Derive the expression for the collector current and gain.	**07**
		OR	
	(c)	Draw the fixed-biased circuit by considering an n–p–n transistor in the CE mode. Derive the expressions for stability factors. What are the functions of the coupling capacitors?	**07**
Q.3	**(a)**	Write a short note on the optocoupler device?	**03**
	(b)	Explain the sixteen segment display and its applications with the necessary circuit diagram.	**04**
	(c)	Draw the approximate hybrid model for any transistor configuration at low frequencies. Show that only h_{ie} and h_{fe} are essential in the model. Is the approximation justified?	**07**
		OR	
Q.3	**(a)**	Explain the varactor diode.	**03**
	(b)	Explain the contraction of the solar cell with its operational principle.	**04**
	(c)	What is self-bias? Draw the circuit showing self-bias of an n–p–n transistor in the CE mode. Explain physically how the self-bias improves stability.	**07**
Q.4	**(a)**	What is MOSFET device? Draw its construction diagram.	**03**
	(b)	Write short notes on the following : (i) Advantages of JFET (ii) Difference between MOSFET and JFET	**04**
	(c)	Compare the different characteristics of the following semiconductor devices: bipolar junction transistor, field-effect transistor.	**07**
		OR	
Q.4	**(a)**	How will you determine the drain characteristics of JFET? What do they indicate?	**03**
	(b)	Explain the common drain configuration for a JFET.	**04**
	(c)	Explain the JFET parameters and establish the relationship between them	**07**

Q.5	**(a)**	What is the thermal runaway in transistors, and how can it be avoided?	**03**
	(b)	What is an Early effect, and how can it account for the CB input characteristics?.	**04**
	(c)	What do you mean by the logic gate and its types? Explain the universal logic gates.	**07**

OR

Q.5	**(a)**	What is the ac load line in the transistor? Write its significance.	**03**
	(b)	The value of alpha increases with the increasing reverse-bias voltage of the collector junction. Why?	**04**
	(c)	Explain the logic families and their types. Describe the characteristics of the same.	**07**

****