

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

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 V_o for the network shown in figure 1	07

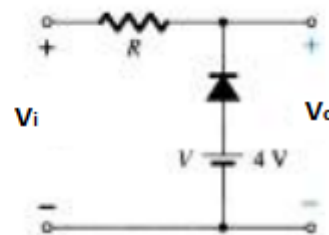
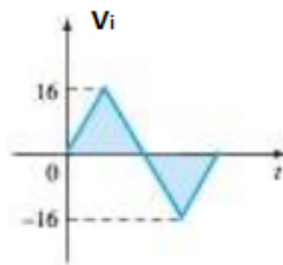


Figure 1

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 V_o for the network of Figure 2. **07**
 Give explanation for your answer.

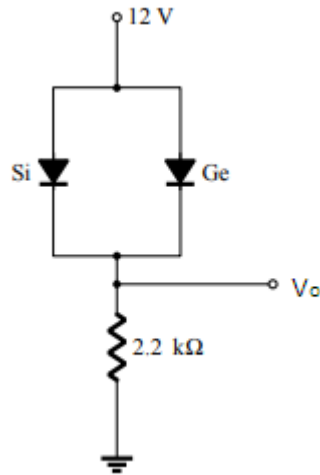


Figure 2

- 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**

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

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 construction 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**
