Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–I-EXAMINATION – SUMMER 2016

Subject Code:X11101 **Date:02/06/2016**

Subject Name:BASIC ELECTRONICS

Time:02:30 PM to 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Explain Followings: **07**

i. Barrier Potential
ii. Voltage equivalent of temperature
iii. Critical wavelength for semiconductor
iv. Mean life time of carrier
v. Mobility of electron
vi. Electron volt
vii. Electric Field

(b) Describe the Hall effect and also explain how it is helpful to determine the different properties of semiconducting material. **07**

Q.2 **(a)** Resistivities of the two sides of a step graded Germinium diode are 2 Ω cm for p – type and 1 Ω cm for n – type region. (a) Calculate the height V_0 of the potential energy barrier. (b) Repeat part (a) for Silicon p – n junction. **07**

(b) Explain the formation of barrier potential in open circuited PN junction diode. Also derive the expression for barrier potential. **07**

OR

(b) What is transition capacitance in PN junction diode also what physical significance is for step graded junction? Prove that transition capacitance is same as parallel plate capacitance. **07**

Q.3 **(a)** Describe two breakdown mechanisms in a p-n junction diode. **07**

(b) i. Explain the two way parallel clipper. **04**
ii. Compare the LED with photo diode. **03**

OR

Q.3 **(a)** Explain Half Wave and Full Wave Voltage Doublers Circuit. **07**

(b) i. Explain How Zener Diode works as a Voltage Regulator. **04**
ii. Compare Center Tap Full Wave Rectifier with Bridge Rectifier. **03**

Q.4 **(a)** Draw CE transistor configuration and give its input and output characteristics. Also indicate different regions. **07**

(b) What is biasing? Why biasing is required for transistor? List biasing methods for transistor. Draw and Explain the circuit of Voltage divider biasing. **07**

OR

Q.4	**(a)**	Determine h-parameter for the two port network Also draw the hybrid model for CE, CB and CC configurations.	**07**
	(b)	Draw a fixed bias circuit. State advantage and disadvantages of Fixed bias circuit. Specify components value to have operating point at (5V, 5mA). Take Vcc=10V, V_{BE}=0.7 V and β=150.	**07**
Q.5	**(a)**	Draw a structure of p-channel MOSFET. Explain its working for enhancement type. Also draw and explain drain characteristics and transfer curve for the same device.	**07**
	(b)	Explain with neat circuit diagram, the working of a transformer coupled class A power amplifier.	**07**

OR

Q.5	**(a)**	Explain the principle of operation of JFET. Also compare FET with BJT.	**07**
	(b)	State the role of voltage regulators in power supplies? Discuss working of a series voltage regulator.	**07**

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