Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER– I EXAMINATION – SUMMER 2015

Subject Code:X 11101 **Date:02/06/2015**

Subject Name: Basic Electronics

Time: 02.30pm-05.00pm **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)**	Illustrate how the energy levels of isolated atoms are split into energy bands when atoms are brought into close proximity to form a crystal.	**07**
	(b)	Draw and explain energy band structures of insulator, semiconductor and metal.	**07**
Q.2	**(a)**	Describe Hall Effect in detail.	**07**
	(b)	Discuss the disadvantages of intrinsic semiconductor.	**07**
		OR	
	(b)	Define hole in a semiconductor and explain pictorially how it contributes to conduction.	**07**
Q.3	**(a)**	Draw and explain V-I Characteristics of ideal and practical diodes.	**07**
	(b)	A step-graded Ge diode having $N_D=500N_A$ is designed with acceptor impurities to the extent of two impurity atoms for 10^8 atoms. Find contact potential at room temperature for given $n_i=2.5x10^{13}$ atoms/cm^3 and total number of atoms are $4.421x10^{22}$.	**07**
		OR	
Q.3	**(a)**	A silicon diode indicates forward currents of 2mA and 10mA when forward voltages are 0.6V and 0.7V respectively. Estimate the operating temperature of diode junction.	**07**
	(b)	What is Peak Inverse Voltage? Explain Full wave rectifier using diode.	**07**
Q.4	**(a)**	Describe Early Effect and state why it is called Base Width Modulation.	**07**
	(b)	Explain Miller's theorem and its dual.	**07**
		OR	
Q.4	**(a)**	Discuss Thermal Runaway and Thermal Stability.	**07**
	(b)	Draw and explain circuit of phototransistor.	**07**
Q.5	**(a)**	Discuss complete classification of FET.	**07**
	(b)	Explain working of Push-pull amplifier.	**07**
		OR	
Q.5	**(a)**	What is Amplification Factor? Describe pinch off condition.	**07**
	(b)	Draw n-channel MOSFET. Differentiate between Depletion mode and Enhancement Mode.	**07**

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