Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–I - EXAMINATION – SUMMER 2017

Subject Code: X11101 **Date:01/06/2017**

Subject Name: BASIC ELECTRONICS

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

Instructions:

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

Q.1 **(a)** Define following terms: **07**

1. Mobility
2. Barrier Potential
3. Dark Current of Photodiode
4. Tunneling effect
5. Transition capacitance
6. Thermal runaway
7. Pinch-off voltage of JFET

(b) Justify semiconductor behaves as an insulator as well metal. Explain the energy band diagram of Insulator, Semiconductor and Metal with necessary diagrams. **07**

Q.2 **(a)** State the law of mass action. List and explain the electrical properties of Si and Ge with necessary information. **07**

(b) Explain the temperature dependency of V-I characteristics of diode. Justify reverse leakage current doubles in every 10 ºC rise in temperature. **07**

Q.3 **(a)** List the different types of clipping circuit and explain biased clipper in detail. **07**

(b) Draw and explain the full wave bridge rectifier with necessary circuit and waveforms. Derive the value for E_{dc} for it. **07**

Q.4 **(a)** Explain the current components in transistor with necessary diagrams. **07**

(b) Why transistor operated in active region for amplification? Explain the CE amplifier with output characteristics showing the different region of operation. **07**

Q.5 **(a)** What do you mean by Hybrid-parameters? How it can be useful for analyzing transistor? Draw the equivalent h-parameter circuit for CB and CC configuration. **07**

(b) Explain Miller's theorem and its dual with necessary circuit diagrams. **07**

Q.6 **(a)** What is biasing? Explain the self-bias circuit with necessary derivations. **07**

(b) Draw the construction of JFET and explain its working with its V-I characteristics. Give the comparison between BJT and FET. **07**

Q.7 **(a)** Explain the working of transformer coupled audio power amplifier with necessary circuit diagrams. **07**

(b) What is cross-over distortion? Explain the complementary push pull amplifier with necessary circuit diagrams. **07**

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