Code: EE2T4

**I B.Tech - II Semester – Regular/Supplementary Examinations
April - 2018**

**BASIC ELECTRONIC DEVICES AND CIRCUITS
(ELECTRICAL & ELECTRONICS ENGINEERING)**

Duration: 3 hours   Max. Marks: 70

PART – A

Answer ***all*** the questions.   All questions carry equal marks

11x 2 = 22 M

1.
   a) Define diffusion capacitance.
   b) Distinguish Avalanche and Zener breakdown mechanisms.
   c) Draw the circuit diagram of full wave rectifier with waveforms.
   d) Define filter.
   e) List the types of transistor amplifier configurations.
   f) List the methods of transistor biasing.
   g) What is meant by Q-Point?
   h) What is the need for biasing a transistor?
   i) Define pinch off voltage.
   j) Define oscillator.
   k) What are the general characteristics of negative feedback amplifier?

PART – B

Answer any *THREE* questions. All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2. a) Explain the principle and operation of varactor diode. 8 M

   b) A 230 V, 60 Hz voltage is applied to the primary of a 5:1 step-down center-tap transformer used in full wave rectifier having a load of 900Ω. If the diode resistance and secondary coil resistance together has a resistance of 100Ω determine: i) dc voltage across the load   ii) dc current flowing through the load iii) dc power delivered to the load iv) PIV across each diode   v) ripple voltage and its frequency   vi) rectification efficiency.   8 M

3. a) Explain the input and output characteristics of a transistor Connected in CB configuration with necessary diagram and waveforms.   8 M

   b) Explain the characteristic of JFET.   8 M

4. a) Explain with neat diagram for the fixed bias method.   8 M

   b) Design a voltage divider bias network using a supply of 24V, β=110, and I_{CQ}=4mA, V_{CEQ}=8V. Choose V_E=V_{CC}/8.   8 M

5. a) Draw the hybrid model for the transistor in CE
    configuration and explain using exact analysis.   8 M

   b) Compare CB, CE, CC transistor amplifier configurations.
                                                            8 M

6. a) Compare positive and negative feedback.   8 M

   b) Explain working principle of colpitt's oscillator with
    diagram and derive the frequency of operation for it.   8 M