Code: CS2T5, IT2T5

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

BASIC ELECTRONICS ENGINEERING
(Common for CSE & IT)

Duration: 3 hours   Max. Marks: 70

PART – A

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

$$11 \times 2 = 22 \text{ M}$$

1.
   a) What is the difference between intrinsic and extrinsic semiconductors?
   b) Why LED emits light when it is forward biased?
   c) What is the average value of a half wave rectified voltage with a peak value of 60 V?
   d) When a 60 Hz sinusoidal voltage is applied to the input of a full wave rectifier, what is the output frequency?
   e) What does the Q-point of an amplifier represent?
   f) Why is the base current in a transistor so much less than the collector current?
   g) What is early effect or base width modulation?
   h) Compare a practical op-amp to ideal op-amp?
   i) Define the op-amp parameters Common Mode Rejection Ratio (CMMR) and slew rate.
   j) Draw the circuit diagram of Inverting and Non inverting amplifiers

k) Define the terms input offset voltage and output offset voltage of an op-amp.

<div align="center">PART – B</div>

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

<div align="right">3 x 16 = 48 M</div>

2. a) Draw and explain the VI characteristics of PN junction diode. 8 M

   b) Derive the equation for P-N junction diode current. 8 M

3. a) Explain about half wave rectifier with neat sketches. 8 M

   b) A 220v, 60 Hz voltage is applied to a center –tapped step-down transformer of 22:1 with a load of 1kΩ connected across the output of two-diode full –wave rectifier. Assume diodes to be ideal. If the resistance of half-secondary winding is 0.5ohm, determine the (i) peak, rms and dc voltages across the load (ii) peak, rms and dc currents through the load (iii) dc power delivered to the load. 8 M

4. a) Explain the input and output characteristics of a transistor in CB configuration. 8 M

   b) A transistor operating in CB configuration has I_C =2.98 mA, I_E = 3 mA and Ico=0.01mA. What current will flow in the collector circuit of this transistor when connected in

CE configuration with a base current of 30µA?   8 M

5. a) Draw the basic internal block diagram of an op_amp and
      explain each block.   8 M

   b) Describe some of the characteristics of a practical op-amp.
                                                       8 M

6. a) Explain how the op-amp is used as an integrator and with
      necessary equations and draw the input and output
      waveforms by considering square wave as input.   8 M

   b) Write a short notes on op_amp comparators.   8 M