PVP 14

Code: CS2T5, IT2T5

I B.Tech - II Semester – Regular/Supplementary Examinations
April - 2019

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 x 2 = 22 M

1.

a) What is meant by intrinsic and extrinsic semiconductors?
b) Describe the volt-ampere characteristics of a photodiode.
c) A half wave rectifier is used to supply 24V DC to a resistive load of 500Ω and the diode has a forward resistance of 50Ω. Calculate the maximum value of the AC voltage at the input.
d) Draw the circuit diagram of full wave rectifier with waveforms.
e) Derive the relationship between α and β.
f) Give the relation between I_C & I_{CEO} and between I_{CEO} & I_{CBO}.
g) Draw the circuit diagram of closed loop non-inverting operational amplifier (OP-AMP).
h) How does the slew rate measured?
i) What is meant by PSRR?
j) What are the applications of differentiator and integrator?
k) Define Comparator.

PART – B

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

3 x 16 = 48 M

2. a) Discuss the following with respect to semiconductor:
(i) doping (ii) dopant (iii) donor and (iv) acceptor 8 M

b) Derive the conductivity equation for an N-type and P-type semiconductor. 8 M

3. a) Draw the circuit diagram of full-wave rectifier and explain its operation. 8 M

b) A bridge rectifier with capacitor filter is fed from 220V to 40V step-down transformer. If average DC current to the load is 1A and capacitor filter of 800μF, calculate the V_{rms}, I_{rms}, V_{dc} and ripple factor. Assume power line frequency of 50Hz, neglect diode forward resistance and DC resistance of secondary of transformer. 8 M

4. a) Explain how transistor is used as a switch. 8 M

b) Explain the input and output characteristics of an NPN transistor in CB configuration. 8 M

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

b) State assumptions made for analyzing ideal op-amp and explain. 8 M

6. a) Explain the operation of op-amp as non-inverting amplifier. 7 M

b) Explain the operation of op-amp as a differentiator. Plot the input and output waveforms by considering square wave as input. 9 M