PVP 14

Code: EE2T4

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

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) How P and N type semiconductors are formed?
b) Differentiate half wave and full wave rectifier.
c) Why collector region is greater than emitter region?
d) Deduce the relationship between α and β.
e) Write the difference between BJT and JFET.
f) What is the need for biasing a BJT.
g) What is meant by Q-Point?
h) Why CE configuration is mostly used in the design of amplifiers?
i) Why h parameters are used in small signal analysis?
j) Define feedback amplifier? How it classify.
k) What are the advantages of negative feedback amplifier?

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.
3 x 16 = 48 M

2. a) What is the significance of breakdown in junctions? Explain Avalanche and Zener break down. 8 M

   b) Explain the volt-ampere characteristics of tunnel diode with the help of energy band diagrams. 8 M

3. a) Show that transistor acts as an amplifier and switch. 8 M

   b) Discuss about enhancement and depletion mode of MOSFET. 8 M

4. a) Why self bias circuit is preferred than other biasing circuits? Derive the expression for stability factor of self bias circuit. 8 M

   b) Define Thermal runaway, how to overcome this? 8 M

5. a) For a single stage transistor amplifier, R_S=5KΩ and R_L= 20KΩ the h- parameter values are h_{fe} = 50, h_{ie} =1.1K Ω , h_{re} = 2.5x10^{-4}, h_{oe} = 25μA/V. Find A_I,A_V, A_{Vs}, R_i, and R_o for the CE transistor configuration. 8 M

b) Draw the transistor hybrid-π model. Explain the analysis of CE transistor at high frequencies. 8 M

6. a) Draw the block diagram of a feedback amplifier and explain each block giving its function. 7 M

b) What is the Condition for sustained oscillations, draw and explain the RC-phase shift oscillator with transistor. 9 M