PVP 14

Code: EC2T5

I B.Tech - II Semester - Regular / Supplementary Examinations
May 2017

ELECTRONIC DEVICES & CIRCUITS
(ELECTRONICS & COMMUNICATION 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 i) Magnetic field intensity
   ii) Electric field intensity
b) Draw the Energy band diagram of PN diode.
c) Explain Avalanche Break down mechanism in diodes.
d) Define i) Efficiency ii) Form factor of Rectifier.
e) Draw the circuit diagram of Bridge Rectifier.
f) Describe the Early effect of Transistor.
g) Establish the relation between α and β of transistor.
h) Draw Fixed bias circuit of CE Transistor.
i) Give two applications of Photo Transistor.
j) Define two Stability Factors.
k) What is the advantage of self biasing circuit.

PART – B

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

3 x 16 = 48 M

2. a) Derive the expression for transit time, and final velocity in the case of an electron traversing in uniform electric field. 8 M

b) An electron with a velocity of $3x10^5$ ms^{-1} enters an electric field of 910 v/m making an angle of 60˚ with the positive y direction. The direction of the electric field is in the positive Y direction. Calculate the time required to reach its maximum height. 8 M

3. a) Explain the operation of Zener diode with V-I Characteristics. 8 M

b) Explain Principle of Operation and characteristics of Varactor Diode. 8 M

4. a) Derive the expression for ripple factor and efficiency of Full wave Rectifier. 8 M

b) A Full wave rectifier circuit uses two Silicon diodes with a forward resistance of 20 Ω each. A DC voltmeter connected across the load of 1 KΩ reads 55.4 volts. Calculate: 8 M

i) I_{rms}

ii) Peak Inverse Voltage across each diode.

iii) Ripple factor.

iv) Transformer Secondary Voltage rating.

5. a) Explain the operation of N-channel JFET and also draw Drain Characteristics. 8 M

b) Define R_d, g_m and μ of JFET and establish the relation between them. 8 M

6. a) Derive the expression for stability factor of collector to base bias circuit. 8 M

b) In collector to base bias method, An NPN Transistor if β=50 is used in common emitter circuit with V_{CC} =10 V, R_C =2KΩ, and R_B =100KΩ, Determine the Operating point. 8 M