

Code: EC2T5

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

**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) Electric Field Intensity, (ii) Potential
- b) Mention the functions of deflection plates in Cathode Ray Oscilloscope.
- c) Explain the Zener breakdown mechanism.
- d) Draw energy band diagram of PN junction diode.
- e) Define (i) Ripple Factor, (ii) Efficiency of rectifier.
- f) Draw the circuit diagram of Full Wave centre tap Rectifier.
- g) Establish the relationship between  $\alpha$  and  $\gamma$ .
- h) Write two applications of Transistor.
- i) Sketch the voltage divider bias circuit.
- j) Define Thermal runaway.
- k) Differentiate between BJT and FET.

## 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) What is the trajectory of a charged particle entering in a direction perpendicular to a uniform magnetic field?

Explain.

8 M

3. a) Compare characteristics of PN Junction diode, Zener Diode and Tunnel Diode.

8 M

b) Explain different current components in a PN junction diode and hence derive the diode current equation.

8 M

4. a) Derive the expression for the ripple factor of  $\pi$  – section filter when used with half wave rectifier. Make necessary approximations.

8 M

b) A full wave rectifier produces an RMS voltage of 10V at 50Hz and feeds a resistance of 1.1K $\Omega$  and filter uses C=50 $\mu$ F. Find the ripple output voltage.

8 M

5. a) Draw the input & output characteristics of a NPN transistors in CB configuration & explain. 8 M
- b) For a silicon Transistor,  $\alpha=0.995$ , emitter current is 10mA & leakage current  $I_{C0}=0.5\mu\text{A}$ . Find  $I_C$ ,  $I_B$ ,  $\beta$ ,  $I_{CE0}$ . 8 M
6. a) Explain the criteria for fixing operating point for BJT. 8 M
- b) In a Fixed bias circuit determine  $I_B$ ,  $I_C$  and  $V_{CE}$  if transistor is of silicon. Take  $V_{CC}=10\text{V}$ ,  $R_B=2.5\text{M}\Omega$ ,  $R_C=15\text{K}\Omega$  and  $\beta=90$ . 8 M