

**II B. Tech I Semester Supplementary Examinations, October/November - 2020**  
**ELECTRONIC DEVICES AND CIRCUITS**  
(Com to ECE, EIE and ECC)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answer **ALL** the question in **Part-A**  
3. Answer any **FOUR** Questions from **Part-B**

**PART -A**

1. a) Compare drift and diffusion currents of a Semiconductor in detail. (2M)
- b) Distinguish between avalanche and Zener mechanisms of a diode. (3M)
- c) Show that a PN diode work as rectifier. (3M)
- d) Write short note on photo transistor? (2M)
- e) Explain the concept of Thermal runaway in detail? (2M)
- f) Draw the transistor hybrid model circuit. (2M)

**PART -B**

2. a) Derive the expression for Concentration of Hole and Electron in an intrinsic semiconductor and also prove the Fermi level position in intrinsic semiconductor. (7M)
- b) Sketch the conduction and valence bands before and after diffusion of carriers in a PN junction (7M)
3. a) What is UJT and draw the Construction, operation of a UJT along with its characteristics (7M)
- b) Explain the following diodes in detail. (7M)  
(i)Photo diode    (ii) Varactor diode
4. a) Define the following terms in detail (i)ripple factor (ii)peak inverse voltage. (7M)  
(iii)efficiency (iv)transformer utilization factor (v)form factor (vi)peak factor
- b) Draw and explain the ripple factor of full-wave rectifier with shunt capacitor filter in detail. (7M)
5. a) A Germanium transistor used in a complementary symmetry amplifier has  $I_{CBO}=10\mu A$  at  $27^\circ C$  and  $h_{FE}=50$ . (i) Find  $I_c$  when  $I_b=0.25mA$  (ii) assuming  $h_{FE}$  does not increase with temperature. Find the value of new collector current, if the transistor temperature rises to  $50^\circ C$ . (7M)
- b) List out Few comparisons of CB ,CE and CC configurations with examples. (7M)
6. a) Draw the Self bias circuit and derive the stability factor for it along with explanation. (7M)
- b) An NPN transistor if  $\beta=50$  is used in common emitter circuit with  $V_{cc}=10V$  and  $R_c=2k\Omega$ . The bias is obtained by connecting  $100k\Omega$  resistor from collector to base. Find the quiescent point and stability factor. (7M)

7. a) Draw the Common emitter amplifier with Emitter resistor and explain its (7M)  
operation.
- b) List out the few comparison of Transistor amplifier configurations in detail. (7M)