R16

Reg. No:

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 a Explain Drift and Diffusion currents in a semiconductor. **6M**
  b With expressions, explain mobility and conductivity of a semiconductor. **6M**

OR

2 a Draw and explain the energy band diagram of PN Junction Diode. **6M**
  b Calculate the dynamic forward and reverse resistance of PN Junction silicon diode when the applied voltage is 0.25V at $T = 300\degree K$ with given Io = 2µA. **6M**

UNIT-II

3 a Draw the basic structure of an SCR. Explain its characteristics and list the applications. **8M**
  b Define Holding Current and Latching Current of SCR. **4M**

OR

4 a Draw and explain VI characteristics of Tunnel Diode. **6M**
  b Discuss the energy band structure of a Tunnel Diode. **6M**

UNIT-III

5 a An AC supply of 230V is applied to a HWR through transformer of turn's ratio 5:1. Assume diode is an ideal one. RL is 300 Ohms. Calculate **8M**
        a) DC output Voltage
        b) PIV
        c) Efficiency
  b Derive the Ripple factor expression for a full wave rectifier using capacitor filter. **4M**

OR

6 a Draw the circuit of inductor filter and explain its operation. **6M**
  b Derive the expression for ripple factor of inductor filter. Mention the need of Bleeder resistor **6M**

UNIT-IV

7 a With a neat diagram, explain how a transistor acts as an amplifier. **6M**
  b With neat sketches explain the cut off region, active region and saturation region of a common base transistor output characteristics. **6M**

OR

8 a Explain the construction and principle of operation of N-channel JFET. **6M**
  b Define the JFET Volt-Ampere Characteristics and determine FET parameters. **6M**

UNIT-V

9 a Describe the factors to be considered while designing the biasing circuit which are responsible for shifting the operating point. **6M**
  b Define Transistor Biasing and explain the need for Biasing. **6M**

OR

10 a Derive an expression for stability factors S and S' for Collector to base bias circuit. **8M**
   b A Transistor has $\beta = 150$ find collector and Base currents if $I_E = 10$ mA **4M**

*** END ***