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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)**B.Tech II Year I Semester Supplementary Examinations November 2020****BASIC ELECTRONIC DEVICES**

(EEE &amp; ECE)

Time: 3 hours

Max. Marks: 60

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

**UNIT-I**

- 1 a Describe the Temperature Dependence of PN Junction Diode on VI Characteristics. **6M**  
 b Determine the value of forward current in the case of a PN junction diode, with  $I_o = 10\mu A$ ,  $V_f = 0.8V$  at  $T = 300^\circ K$ . Assume Silicon Diode. **6M**

**OR**

- 2 a With neat diagrams, explain the construction and operation of a PN Junction diode under no bias, forward bias and reverse bias conditions with its V-I Characteristics. **8M**  
 b Find the factor by which the reverse saturation current of a silicon diode will get multiplied when the temperature is increased from  $27^\circ C$  to  $82^\circ C$ . **4M**

**UNIT-II**

- 3 a Draw and explain the VI characteristics of a Zener Diode. **6M**  
 b Compare and contrast Zener diode and conventional PN Junction Diode. **6M**

**OR**

- 4 a With neat diagram, describe the working principle and characteristics of UJT. **8M**  
 b Write notes on Photo Transistor. **4M**

**UNIT-III**

- 5 a Draw the circuit diagram of Full wave rectifier and explain its operation with the help of waveforms. **6M**  
 b Derive the expressions for Ripple Factor and Efficiency of Full Wave Rectifier. **6M**

**OR**

- 6 A Half wave rectifier has a load of  $3.5k\Omega$ . If the diode resistance and the secondary coil Resistance together have resistance of  $800\Omega$  and the input voltage of  $240V$ , Calculate (i) Peak, Average and RMS value of the current flowing, (ii) DC power output, (iii) AC Power input and (iv) efficiency of the rectifier. **12M**

**UNIT-IV**

- 7 a With neat diagram, explain the Input characteristics of a BJT in CE Configuration. **6M**  
 b Derive the relation between  $\alpha$ ,  $\beta$  and  $\gamma$  of a Transistor. **6M**

**OR**

- 8 a With the help of neat diagram, explain the operation and characteristics of n-channel enhancement type MOSFET. **8M**  
 b Give the comparison between JFET and MOSFET. **4M**

**UNIT-V**

- 9 a Design a collector to base bias circuit for the specified conditions:  $V_{CC} = 15V$ ,  $V_{CE} = 5V$ ,  $I_C = 5mA$  and  $\beta = 100$ . **6M**  
 b Discuss Diode Compensation Technique for the parameters  $V_{BE}$  and  $I_{CO}$ . **6M**

**OR**

- 10 a Explain the concept of DC and AC Load lines and discuss the criteria for fixing the Q-point. **6M**  
 b Derive the expression for Stability Factor S of a Fixed Bias Circuit **6M**

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