**DEPARTMENT OF EEE**

**EC6202 ELECTRONIC DEVICES AND CIRCUITS**

**QUESTION BANK**

**UNIT I**

**PN JUNCTION DEVICES**

**Two Mark Questions:**

1. What is a PN junction? How is it formed?
2. Define Cut in Voltage and Breakdown Voltage?
3. Define Regulators?
4. What is meant by Zener breakdown?
5. List any two advantages of LED display?
6. What is meant by depletion region in a PN junction diode?
7. A silicon PN junction has reverse saturation current of 10nA at VT is 26mV. Calculate the junction current when the applied Voltage is 0.7V in forward bias.
8. Define the term diffusion capacitance?
9. Define transition capacitance?
10. What is break down? What are its types?
11. What is avalanche break down?
12. What is Half wave rectifier?
13. What is Full Wave Rectifier?
14. What is a LED? Draw its symbol?
15. What are advantages and disadvantages of Laser Diode?
16. Define Knee Voltage of a Diode?
17. What is PIV?
18. Draw the VI characteristics of a PN junction diode?
19. A diode has a saturation current of 7.5μA at room temperature 300 ̊K. Calculate the saturation current at 400 ̊K.
20. Define Zener diode?

**Sixteen Mark Questions:**

1. With neat diagram explain the VI characteristics of PN junction diode?

2. Explain the working and VI characteristics of Zener diode?

3. Explain the operation of a zener diode shunt voltage regulator.

4. Explain in detail about the LED and Laser diode?

5. Explain the half-wave rectifier with necessary waveforms and also derive the necessary expressions? ( with and without Filter )

6. Explain the Centre-tapped full-wave rectifier with necessary waveforms and also derive the necessary expressions? ( with and without Filter )

7. Explain the full-wave bridge rectifier with necessary waveforms and also derive the necessary expressions? ( with and without Filter )

8. Explain the diffusion and Transition Capacitances and also derive the expressions for CD and CT?

9. a) Explain the Diode Current equation and also derive the expressions for Junction Voltage?

b) Explain the Short notes on Diode Resistances?

10. a) A Silicon pn junction has the reverse saturation current of I0=30nA at temperature 300K. Calculate the junction current, when the applied Voltage is (a) 0.7V and (b) 40V RB.

b) A HWR having resistive load of 1000Ω , it rectifies an ac voltage of 325V peak value and the diode has a forward resistance of 100Ω. Calculate a) peak, average and rms value of current , and b) efficiency?

**UNIT II**

**TRANSISTORS**

**Two Mark Questions:**

1. What is a transistor (BJT)?
2. What is the relationship between α and β ?
3. What is biasing? List the types of biasing?
4. Draw the Eber-Molls model of a transistor.
5. Transistor means “transfer Resistance”, explain this?
6. Define early effect.
7. Name the different operating regions of transistor and When the transistor acts as a switch.
8. In CB configuration, IE is 6.28mA and IC is 6.2mA. Determine the common base current gain?
9. What are the requirements for biasing circuits?
10. What is a MOSFET? Name its types.
11. Mention the three regions that are present in the drain-source characteristics of JFET.
12. What is pinch-off voltage in FET?
13. Define Transconductance and amplification factor in JFET?
14. Why FET is called voltage controlled device and the BJT called a current controlled device?
15. List the JFET parameters.
16. Compare JFET with BJT?
17. An N-channel JFET has IDSS=10mA and VP= -7V.Determine the drain current ID for VGS=-3V?
18. Define Interbase resistance and Intrinsic stand-off ratio of UJT?
19. What is SCR?also give its applications?
20. List the merits and Demerits of IGBT?

**Sixteen Mark Questions:**

1. With neat diagram explain the Input and Output characteristics of a transistor in CE & CB configurations?
2. With neat diagram explain the Input and Output characteristics of a transistor in CC configuration? List out the comparisons between CE, CB and CC?
3. Explain the construction and operation of N-channel JFET with neat sketches and characteristics curves. Also explain the three distinct regions of the output characteristics?
4. Explain the working of n-channel enhancement MOSFET. Sketch its typical characteristics.
5. Explain the working of depletion MOSFET. Sketch its typical characteristics.
6. Explain the construction, principle of operation, characteristics and applications of UJT?
7. Explain the working of UJT as a relaxation oscillator with necessary waveforms and equations.
8. Explain the construction and operation of thyristor with neat sketches and characteristics curves.
9. Explain the construction, principle of operation, characteristics and applications of IGBT?
10. a) In a CB transistor circuit , the IE is 10mA and the collector current Ic is 9.8μA. Find the value of the base current IB.

b) If a transistor has a α of 0.97. Find the value of β. If β=200, find the value of α.