

B.Sc. F.Y. - I (C.B.C.S. Pattern) Sem-I  
**USELT02 - Electronics Paper - II**  
**(Semiconductor Diodes and Analog Electronics)**

P. Pages : 2

Time : Three Hours



**GUG/W/19/11549**

Max. Marks : 50

- Notes :
1. All questions are compulsory and carry equal marks.
  2. Draw neat and labelled diagrams wherever necessary.
  3. Use of log table / calculator is allowed.

**1.** Either :

- a) With the help of circuit diagram, explain the  $V - I$  characteristic of forward biased PN junction diode. What is the difference between ideal and practical diode? **6+4**

**OR**

- b) Explain the formation of depletion region in the p – n junction diode. Explain Zener break down mechanism. **6+4**

**2.** Either :

- a) Draw the circuit diagram of half wave rectifier and explain its working with input and output wave forms. **6+4**  
Derive an expression for  $I_{dc}$  and  $I_{rms}$ .

**OR**

- b) What is filter? Explain the role of shunt capacitor filter in the power supply. **6+4**  
With the circuit diagram, explain the working of Zener diode regulator.

**3.** Either :

- a) What is dc load line? Draw dc load line and explain the importance of Q – point in output characteristics of transistor. **4+6**

Define :

- i) Cut off region
- ii) Saturation region
- iii) Active region

**OR**

- b) What is biasing? Explain the potential divider biasing method of the transistor. State its advantages. **7+3**

**4.** Either :

- a) What is n-parameters? Obtain the expressions for  $h_{11}$  and  $h_{21}$  in CE mode configuration of transistor. **2+8**

**OR**

b) Define :

4+6

- i) Input impedance
- ii) Output impedance
- iii) Voltage gain
- iv) Power gain

Derive the voltage gain in low frequency range using h-parameter.

5. Attempt **any ten** of the followings :

1x10

- i) Define cut off voltage in diode.
- ii) Write diode equation.
- iii) Give the symbol of Schottky diode.
- iv) State the advantages of full wave bridge rectifier over half wave.
- v) Define reverse saturation current.
- vi) Draw the V – I characteristics of Zener diode the Reverse bias mode.
- vii) Draw the symbol of PNP and NPN transistor.
- viii) If  $\alpha = 0.98$  the find  $\beta$  ?
- ix) Explain the concept of thermal runaway.
- x) What is two port network?
- xi) Draw frequency response curve of RC coupled amplifier and labelled it.
- xii) Define current gain.

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