B.Sc. F.Y. (CBCS Pattern) Semester-I

USELT02 - Electronics-II - Semiconductor Diodes and Analog Electronics

P. Pages : 2 **GUG/W/24/11549**

Time : Three Hours * 4 5 0 5 * Max. Marks : 50

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

1. a) Explain the formation of depletion region in p-n junction diode. **6**

b) Differentiate between ideal and practical p-n junction diode. **4**

OR

c) Explain the formation of I-V characteristics of p-n junction diode. **5**

d) Explain avalanche breakdown mechanism in p-n junction diode. **5**

2. a) Draw the circuit diagram of full wave rectifier using centre tap transformer and explain its working with its input and output waveform. **6**

b) What is filter? Explain the role of filter in power supply. **4**

OR

c) Explain the working of half wave rectifier with suitable diagram. State its disadvantages. **5**

d) Explain Zener diode as voltage regulator with suitable circuit diagram. **5**

3. a) Explain the forward characteristics of CE configuration with suitable diagram. **5**

b) Define α and β Derive the relation between α and β. **5**

OR

c) Explain the fixed biasing method of BJT. State its disadvantages. **5**

d) What is thermal runaway? How can it be avoided? **5**

Either:

4. a) Explain transistor as a two port network. **5**

b) Draw the hybrid equivalent circuit of common emitter configuration and explain it. **5**

OR

c) Derive the expression for input impedance and current gain of CE configuration in terms of h-parameters. **5**

d) Draw the hybrid equivalent circuit of CB configuration with proper notation and explain it. **5**

5. Solve **any ten** question of the followings: **1x10**

a) What is p-n junction diode?

b) Define reverse saturation current of p-n junction diode.

c) State the application of p-n junction diode.

d) Draw the circuit diagram of bridge rectifier.

e) Define load regulation.

f) Define ripple factor.

g) Draw the circuit diagram of CB configuration.

h) What is DC load line?

i) Define stability factor S.

j) What is two port network?

k) What is h_{11} and h_{12} ?

l) State the advantages of h-parameter?

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