Bachelor of Science (F.Y.B.Sc.-I) (CBCS Pattern) First Semester

USELT02 - Electronics Paper-II
(Semiconductor Diodes and Analog Electronics)

P. Pages : 2 **GUG/W/18/11549**

Time : Three Hours * 3 6 2 4 * 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) Explain the formation of PN-Junction. **7+3**

Explain what happens when PN-Junction is reverse biased?
Define.
i) Depletion region.
ii) Cut in Voltage.
iii) Dynamic forward resistance.

OR

b) Draw the I-V characteristics of forward biased P-N Junction and explain its importance? **5+5**

Explain how Zener and avalanche breakdown occurs in reverse biased PN-Junction diode.

2. Either

a) What is Rectification? Draw the circuit diagram of full wave bridge rectifier and explain its working with input and output waveforms. **7+3**
Distinguish between Halfwave, full wave and full wave bridge rectifier.

OR

b) What is regulator and regulation? **5+5**
Define.
i) Line regulation ii) Load regulation
Explain the working of capacitor filter with suitable diagram.

3. Either

a) Draw the output characteristics of transistor in CE mode configuration and explain the importance of cut off region, Saturation region and Active region. **10**

OR

b) What are the requirements of biasing the transistor? **3+7**

Explain Voltage divider method of biasing the transistor.
Define set Stability factor.

4. Either

a) What are h-parameters? Explain with hybrid equivalent circuit current and voltage gains in CE mode transistor. **10**

OR

b) Define. **3+7**

i) Lower cutoff frequency.
ii) Higher cutoff frequency.
iii) Bandwidth.

Derive the voltage gain in low frequency range using h- parameters in RC coupled amplifier.

5. Attempt **any ten** of the following.

a) Draw the circuit Symbol of Schottky diode and Zener diode. **1**

b) Define static resistance in diode. **1**

c) Write Diode equation. **1**

d) State any two advantages of full wave center tap rectifier. **1**

e) Define ripple factor. **1**

f) Define reverse saturation current. **1**

g) Define thermal runway. **1**

h) If $\alpha = 0.98$ then find β. **1**

i) Define Q-point. **1**

j) Write any two h- parameters for CB configuration. **1**

k) What is two port network? **1**

l) Draw the hybrid equivalent circuit diagram of CB- configuration. **1**

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