

E-01-Electronics-I : Paper-I (Basic Electronics and Semiconductor Devices)

P. Pages : 1

GUG/W/16/3307

Time : Three Hours



Max. Marks : 50

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

1. Either:

- a) What is resistor? Explain various types of fixed resistors. **10**
Define one farad. Explain the construction and working of ceramic capacitor.

OR

- b) Explain the concept of self inductance and mutual inductance. **10**
Explain the construction and working of transformer. Show that $\frac{V_s}{V_p} = \frac{N_s}{N_p} = \eta$ (turn ratio)

2. Either.

- a) Explain conductor, insulator and semiconductor on the basis of Energy band diagram. **10**
With suitable diagram, explain the forward bias V-I characteristics of diode.

OR

- b) Draw the diagram of halfwave rectifier and explain its working. **10**
Explain Avalanche and Zener break-down mechanism that occurs in diode.

3. Either.

- a) What is transistor? Explain the construction of npn-transistor. **10**
Draw and explain the CE mode of transistor and prove that $\beta = \frac{\alpha}{1-\alpha}$.

OR

- b) With suitable diagram, explain how the input and output characteristics of transistor in CE mode. **10**
Calculate I_E in a transistor for which $\beta = 50$ and $I_B = 20\mu A$.

4. Either.

- a) Explain the construction and working of N-channel JFET. **10**
Draw the drain characteristics of JFET and explain it.

OR

- b) Explain the construction and working of UJT. **10**
Draw the two transistor equivalent circuit of SCR and explain its working.

- 5.**
- a) Explain the construction of mica capacitor. State its advantages. **2½**
 - b) Draw the diagram of full wave rectifier with Centre tap transformer and explain its working. **2½**
 - c) Draw the diagram of cc-configuration of BJT and explain it define γ (Gamma). **2½**
 - d) Draw the V-I characteristics of TRIAC and explain it. **2½**
