

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

P. Pages : 2

Time : Three Hours



GUG/S/18/3307

Max. Marks : 50

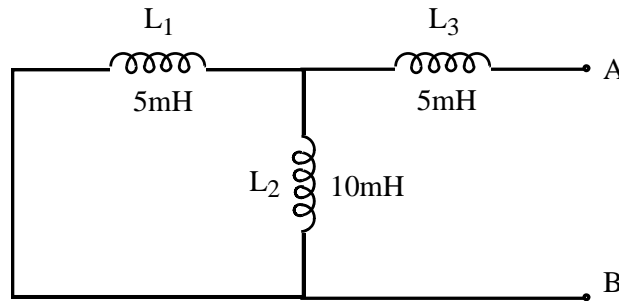
- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw neat diagram wherever necessary.
 3. Use of log table/calculator is permissible.

1. Either

- a) What is resistor? Explain the series and parallel combination of resistors with suitable circuit diagram. **10**
 Explain in brief:
 i) Mica Capacitor
 ii) Ceramic Capacitor.

OR

- b) What is an inductor? Explain self and mutual inductance. **10**
 Calculate the total inductance across terminal A & B



2. Either

- a) What is semiconductor? Explain intrinsic and extrinsic semiconductors. **10**
 Draw the circuit diagram of full wave rectifier and explain its working with input and output waveforms.

OR

- b) What is p-n junction diode? Explain the formation of depletion region in p-n junction diode. **10**
 Explain transition and diffusion capacitance of a p-n junction diode.

3. Either

- a) Draw the symbol of NPN & PNP transistor. Explain the function of each region of transistor. **10**
 Explain CB configuration of NPN transistor.

OR

- b) What is amplifier? Draw the circuit diagram of CE amplifier and explain its working. **10**
 A transistor $\alpha = 0.95$ & $I_E = 1\text{mA}$. Find the value of I_C & I_B .

4. Either 10
- a) Explain the construction and working of N-channel MOSFET.
Define FET parameters, 10
- i) Transconductance (g_m)
 - ii) Amplification factor (μ)
 - iii) Drain resistance r_{d1}
 - iv) Derive relation between μ , r_{d1} and g_m .

OR

- b) Explain SCR as a switch with suitable diagram. 10
Explain the construction and working of UJT.
5. a) What are fixed resistor and variable resistor? Give examples. 2½
- b) Define 2½
- i) Peak Inverse Voltage.
 - ii) Reverse saturation current.
- c) Explain the concept of leakage current in transistor. 2½
- d) Explain the working of DIAC. 2½
