

B.Sc. T.Y. (CBCS Pattern) Sem-VI
USELT13 - Electronics Paper-I (Compulsory) : Photonic Devices and Power Electronics

P. Pages : 2

Time : Three Hours



GUG/W/22/13349

Max. Marks : 50

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

Either

1. a) Explain the radiative transition and optical absorption. **6+4**
Explain the working of LED.

OR

- b) Explain the condition for light amplification in laser. **5+5**
Explain the basic concept of quantum well laser.

Either

2. a) Explain the construction and working of photodiode with suitable diagram. **6+4**
Draw V-I characteristics of photodiode and explain it.

OR

- b) Explain the construction and working of solar cell. **6+4**
Differentiate between LED and LCD display.

Either

3. a) Explain the construction & working of power MOSFET. **7+3**
State the advantages of semiconductor power devices.

OR

- b) Explain the construction and working of SCR with suitable diagram. **6+4**
Define the following terms of SCR
i) Break over voltage
ii) Peak Inverse voltage

Either

4. a) Draw the circuit diagram of single phase half-wave controlled rectifier and explain its working with input and output waveform. **7+3**
Explain the working of triac as a switch.

OR

- b) Draw the circuit diagram of basic series inverter and explain its working with voltage and current waveform. **7+3**
State the limitation of basic series inverter.

5. Attempt **any ten** of the following. **10**

- a) What is photonic device?
- b) State the advantages of LED.
- c) State any two application of laser.
- d) What is photo conductor?
- e) State any two application of LCD.
- f) Draw the diagram of photomultiplier tube.
- g) Define power semiconductor devices?
- h) Draw the symbol of Diac and Triac.
- i) State the application of triac.
- j) What is communication circuit?
- k) What is power inverter?
- l) Draw the circuit diagram of half bridge inverter.
