

B.Sc.- III New CBCS Pattern Semester-VI  
**USELT13 - Compulsory Paper-I - Electronics :**  
**Photonic Devices and Power Electronics**

P. Pages : 2

Time : Three Hours



**GUG/W/23/13349**

Max. Marks : 50

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

**Either:**

1. a) Explain the classification of the photonic devices. 4  
b) Explain the Construction and working of LED. State its advantages. 6

**OR**

- c) Explain the radiative transition. 5  
d) Explain the construction and working of the laser diode. 5

**Either:**

2. a) Explain the construction and working of the Photoconductor. 7  
b) Differentiate between photodiode and photoconductor. 3

**OR**

- c) Explain the working of the solar cell. 3+7  
d) Explain the working of the photomultiplier tube with a suitable diagram.

**Either:**

3. a) Explain the need for semiconductor power devices. 4  
b) Explain the working and construction of SCR. 6

**OR**

- c) Explain the construction and working of DIAC. 5  
d) Explain the diac as a triggering device for triac with a suitable circuit diagram. 5

**Either:**

4. a) Explain the single-phase full-wave phase control rectifier with a suitable circuit diagram. 6  
b) Explain the triac as a switch. 4

**OR**

- c) Explain the need for the commutating circuits in the power control circuit. **5**
- d) Explain the working of the Series inverter with a suitable diagram. **5**

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

- a) What is optical absorption? **1x10**
- b) Differentiate between LED and LASER diode.
- c) State the application of the laser.
- d) What is a phototransistor?
- e) Define quantum efficiency.
- f) Differentiate between LCD and LED.
- g) What is a power MOSFET?
- h) Draw the symbol of TRIAC.
- i) Differentiate between SCR and Triac.
- j) What is a control rectifier?
- k) Draw the circuit diagram of bridge inverter?
- l) State limitation of series inverter?

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