

Th5 Power Electronics & PLC

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. Define latching current and holding current.
 - b. Write the full form of GTO & IGBT.
 - c. Define firing angle (α), Conduction angle (γ) and Extinction angle (β).
 - d. Differentiate between DIAC and TRIAC
 - e. Define Snubber circuit.
 - f. Write down the need of a freewheeling diode in a circuit.
 - g. Define inverter and write any two applications of inverter.
 - h. Define SMPS and mention any two of its advantages over voltage regulators.
 - i. Draw the symbol for NO, NC and Output Coil.
 - j. List down any two applications of PLC.

2. Answer **Any Six** Questions 6 x 5
 - a. Describe briefly different Turn ON Methods of SCR.
 - b. Explain the operation and construction of IGBT and its application.
 - c. With neat circuit diagram explain the working of Step-down Chopper.
 - d. Explain the operation of single phase half bridge voltage source inverter with resistive load.
 - e. Draw the block diagram of SMPS and explain its operation.
 - f. Draw the ladder diagrams of AND, OR, NAND, NOR & XOR gates.
 - g. Explain different parts of PLC by drawing the Block diagram and also explain the purpose of each part of PLC.

3. Explain the construction, operation of SCR and draw its V-I characteristics curve. 10
4. With neat circuit diagram and waveforms explain about RC-firing of SCR. 10
5. Explain with circuit diagram and waveforms of the operation of fully (full wave) controlled single phase bridge converter with Restive load. 10
6. Draw the diagram of a single phase to single phase Step down Cyclo-converter (mid-point) with pure Resistive load and explain and draw its waveform 10
7. Define UPS & Explain the working of on-line and off-line UPS system. 10