

Th-5 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
- Write down the firing i.e. triggering methods.
 - What are the turn on methods of SCR?
 - Define latching current of SCR.
 - What is a free wheeling diode and why it is needed?
 - Define chopper & write different chopper configuration.
 - State the classification of inverters.
 - What is SMPS and why it is preferred in comparison to linear regulator?
 - State the advantages of PLC.
 - Define commutation & why it is essential?
 - Write down two factors affecting speed of the AC motors.
2. Answer Any Six Questions 6 x 5
- Show the two transistor model of SCR & explain its operation.
 - Explain the static V-I characteristics of SCR.
 - Explain the working of a step down chopper with a neat diagram.
 - Explain the working of series inverter.
 - What is the basic principle of cyclo-converter?
 - Explain briefly the operation of chopper in all four quadrants.
 - What is PLC? Write down applications of PLC.

Answer Any Three Questions

- 3 Explain the operation of UJT & also justify how it can be used as a relaxation oscillator. 10
- 4 Explain the working of a half wave converter with R-L load, with and without freewheeling diode. Show the o/p wave forms under the above case. 10
- 5 Explain the principle of working of UPS with a neat block diagram & state its application. 10
- 6 Draw the dynamic characteristics of an SCR and explain in detail. 10

7 Design a two way traffic light signalling system with the following 10 requirements.

1. There should be a START & STOP push button to start the signalling process.

2. Once ON, side-1 lights should follow the patterns below;

Side-1 : Green light should be ON for 30 seconds.

Then Side-1 : Amber light should be ON for 3 seconds.

Then Side-1 : Red light should be ON for 30 seconds and the process repeats.

At the same time Side-2 lights would ON following stages:

Side-2 : Red light should be on for 33 seconds.

Then Side-2: Green light should be ON for 27 seconds.

Then Side-2 : Amber light should be ON for 3 seconds and the process repeats.

5th Sem

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