



- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Draw and explain two transistor analogy of SCR. Also derive the expression for anode current. 7
- b) What do you understand by Thermal Run away? 7
A 100 - A SCR is to be used in parallel with a 150 - A SCR. The on - state voltage drops of the SCRs are 2.1 V and 1.75 V respectively. Calculate the series resistance that should be connected with each SCR if the two SCRs have to share the total current of 250 A in proportion to their ratings.

OR

2. a) Discuss complete protection scheme for SCR to prevent the SCR from over voltage, overcurrent, di/dt and dv/dt . 7
- b) Give classification of various commutation techniques. Explain any one of them with a circuit diagram. 7
3. a) What are the various operating modes of a TRIAC? Explain. 7
- b) Compare the performance of IGBT and MOSFET. 6

OR

4. a) Draw and explain a UJT relaxation oscillator. 7
- b) Explain AC voltage regulator using TRIAC. 6
5. a) Draw and explain the operation of a 1ϕ Bridge fully controlled converter connected with R - L Load with firing angle of 30° with the help of relevant waveforms. Give the expression for output voltage. 7
- b) What is the effect of a free wheeling diode on the operation of a converter circuit? 6

OR

6. a) Explain the operation of a 6 - pulse fully controlled converter with a suitable circuit diagram and relevant waveforms for resistive load for a firing angle of 45° . 7
- b) Explain the effect of source inductance on the operation of single phase fully controlled bridge converter. 6
7. a) What are the strategies for power factor improvement in converter circuits? Explain any one with the help of circuit diagram. 7
- b) Explain how SCR phase controlled converter can be used to control the speed of a DC motor. 6

OR

8. a) Describe the operation of a cyclo - converter with suitable circuit diagram. State its applications. 7
- b) Explain the concept of a Dual converter. Also give applications of Dual converters. 6
9. a) Explain with a proper circuit diagram a step - up chopper. Derive the expression for output voltage. 7
- b) Explain the operation of a series resonant inverter. 6

OR

10. a) A step down chopper operates from a 110 V DC supply and feeds an active load consisting of 11 V DC source in series with a resistance of 0.25Ω and inductance of 1 mH. 7
- Calculate :
- i) Average output voltage.
- ii) Maximum and minimum output current.
- b) Explain the operation of a single phase full bridge basic series resonant inverter. 6
11. a) Describe the operation of 3ϕ bridge inverter in 120° mode of operation. 7
- b) What is pulse width modulation? Explain sinusoidal PWM technique. 7

OR

12. a) Write a short note on 'Applications of Inverters'. 7
- b) Explain the basic principle of a current source inverter. What are its applications? 7
