MODEL QUESTION PAPER

13.801 ELECTRICAL DRIVES AND CONTROL

Part A

(Answer all questions. Each question carries 2 marks.)

1. A 4 pole wave wound dc generator has an armature with 45 slots and each slot contains 18 conductors. It is running at 1200rpm. Flux per pole is 0.016wb. Calculate the generated emf.
2. With schematic explain a series generator.
3. What do you mean by back emf in dc motor? Explain its significance.
4. Draw the structure of power BJT showing doping concentration and thickness of each layer.
5. Compare different types of power transistors.
6. With schematic explain a two quadrant chopper circuit.
7. Explain the principle of phase control. What is its significance?
8. With schematic explain single phase half bridge inverter.
9. Explain the working of on line UPS.
10. A single phase full bridge inverter has a resistive load of R=2.4Ω and dc input voltage is Vs=48V. Determine a) output power b) peak and average current of each transistor.

Part B

MODULE 1

(Answer any one full question from each module. Each question carries 20 marks.)

11. Explain electrical and mechanical characteristics of dc series motor.

12a) With schematics explain different types of self excited generators.

b) A 6 pole long shunt dc compound generator supplies 100A at a terminal voltage of 500V and has armature, series field and shunt field resistances of 0.02Ω, 0.04Ω and 80Ω respectively. Calculate the generated emf.

MODULE 2

13a) With schematics explain switching characteristics of power BJT.

b) Explain any one drive circuit for power BJT.

14a) Explain the constructional details of IGBT.

b) Describe the VI characteristics of IGBT.

MODULE 3

15. Explain the working of single phase half wave circuit with R and RL load.

16. With circuit diagram and waveforms explain the working of single phase dual converter.

MODULE 4

17a) With circuit diagram and waveforms explain the operation of full bridge inverter

b) With schematics explain the principle of sinusoidal pulse width modulation.

18. a) Explain the working of off line UPS.

b) Explain V/F method for controlling speed of induction motor.