



Reg. No. : .....

Name : .....

**Fifth Semester B.Tech. Degree Examination, September 2014  
(2008 Scheme) (Special Supplementary)  
08.504 : ELECTRICAL DRIVES AND CONTROL (T)**

Time : 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions. **Each** question carries **4** marks :

1. Explain the principle of operation of d.c. generator.
2. A 4-pole, lap wound, dc shunt generator has a useful flux per pole of 0.07 Wb. The armature winding consists of 220 turns, each of  $0.004\ \Omega$  resistance. Calculate the terminal voltage when running at 900 rpm, if the armature current is 50 A.
3. Explain the electrical characteristics of dc shunt motor.
4. The armature winding of a 4 pole 250 V dc shunt motor is lap connected. There are 120 slots, each slot containing 8 conductors. The flux per pole is 20 mWb and current taken by the motor is 25 A. The resistance of armature and field windings are 0.1 and  $125\ \Omega$  respectively. If the rotational losses are 810 W, find
  - 1) Gross torque
  - 2) Useful torque
  - 3) Efficiency
5. Explain the switching characteristics of power MOSFET with the help of figure.
6. What are the requirements of drive circuits for power BJT ? Explain any one drive circuit.
7. Explain the principle of phase controlled converter operation.
8. With block schematic, explain on-line UPS.
9. Explain the principle of vector control.
10. Explain FBSOA and RBSOA of power MOSFET.

**PART – B**

Answer **any two** questions from **each** Module. **Each** question carries **10** marks :

**Module – 1**

11. a) Draw and explain different types of dc generators.  
b) A separately excited generator, when running at 1000 rpm supplied 200 A at 125 V. What will be the load current when speed drops to 800 rpm, if field current is unchanged ? Given armature resistance =  $0.04 \Omega$  and brush drop = 2 V.
12. Explain the principle of operation of a three phase induction motor.
13. With the help of diagram, explain the constructional details of dc generator.

**Module – 2**

14. Draw the structure of IGBT and explain its features and working.
15. Explain the principle of a full wave controlled rectifier with resistive load.
16. With circuit diagram, explain the operation of four quadrant converter.

**Module – 3**

17. With the help of circuit diagram, explain the operation of full bridge inverter.
18. With schematics, explain sinusoidal PWM.
19. Explain voltage source inverter driven induction motor, with the help of circuit diagram.

