



Reg. No. :

Name :

**Fifth Semester B.Tech. Degree Examination, November 2013
(2008 Scheme)**

08.504 : ELECTRICAL DRIVES & CONTROL (T)

Time : 3 Hours

Max. Marks : 100

PART - A



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

1. A 4 pole generator, having wave wound armature winding has 51 slots, each slot containing 20 conductors. What will be the voltage generated in the machine when driven at 1500 rpm assuming the flux per pole to be 7.0 mwb ?
2. With schematic explain a shunt wound generator.
3. Explain the mechanical characteristics of dc series motor.
4. Give the features of dc series and shunt motor. Give its applications.
5. With circuit schematic explain a base drive circuit for power BJT.
6. Explain the switching characteristics of power BJT.
7. Differentiate on line ups and off line ups.
8. Explain the working of push pull inverter.
9. Compare vector control and scalar control.
10. The single phase full bridge inverter has a resistive load of $R = 2.4 \Omega$ and dc input voltage is $V_s = 48 \text{ V}$. Determine
 - a) rms output voltage at the fundamental frequency
 - b) output power
 - c) peak and average current of each transistor.



PART – B

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

Module – 1

11. a) Explain the principle of operation of dc generator.
b) Give the function of commutator in dc generator.
12. A compound generator is used to supply a load of 250 lamps each rated at 100 W, 250 V. The resistances of armature, series field and shunt field are 0.02Ω , 0.04Ω and 80Ω respectively. Determine the generated emf when machine is connected in
 - 1) long shunt
 - 2) short shunt. Take voltage drop per brush as IV
13. With schematics, explain the working of 3 phase induction motor.

Module – 2

14. The β of a bipolar power transistor varies from 8 to 40. The load resistance $R_C = 11 \Omega$. The dc supply voltage $V_{CC} = 200 \text{ V}$ and the input voltage to the base drive is $V_B = 7 \text{ V}$. If $V_{CE}(\text{sat}) = 1.0 \text{ V}$ and $V_{BE}(\text{sat}) = 1.5 \text{ V}$ find
 - a) The value of R_B that result in saturation with an ODF of 10
 - b) β forced and
 - c) Power loss P_T is transistor
15. With circuit diagram explain the working of four quadrant converter.
16. With circuit diagram and waveforms explain the working of single phase full wave controlled rectifier with R load.

Module – 3

17. With circuit diagram and waveforms, explain the operation of full bridge inverter.
18. With schematics explain the principle of sinusoidal pulse width modulation.
19. a) Explain V/f method for controlling speed of induction motor.
b) What is the principle of scalar control ? Explain.