



Reg. No. :

Name :

**Fifth Semester B.Tech. Degree Examination, November 2014
(2008 Scheme)**

08.502 : ELECTRICAL TECHNOLOGY (MPU)

Time : 3 Hours

Max. Marks : 100

Instruction : Answer **all** questions from Part A and **any one full** question from **each** Module of Part B.

PART – A



1. Derive the emf equation of a DC Generator.
2. A DC Shunt Generator delivers 420 V at 1500 rpm. What can be emf at 1000 rpm for the same excitation ?
3. What is the significance of back emf in a DC Motor ?
4. What precaution should be made while starting a DC series Motor and why ?
5. Draw the per phase equivalent circuit of a transformer and mention what each parameter represents ?
6. Define synchronous speed of an Alternator. How is it related with rotating magnetic field ?
7. Classify Induction Motors on the basis of construction.
8. Mention the different electrical braking methods and state which is the fastest among these ?
9. What are the functions of instrument transformers and where are they used ?
10. Briefly explain the starting procedure of a synchronous Motor. **(10×4=40 Marks)**

PART – B

Module – I

11. a) What are the conditions for self excitation of a DC Generator and explain how OCC of a given Generator can be plotted ? **10**



- b) A DC Shunt machine when runs as a motor on no-load takes 440 W and runs at 1000 rpm. The field current and armature resistances are 1A and 0.5Ω resp. Calculate the efficiency, as a
- 1) motor taking 40 A from a 220 V supply.
 - 2) generator delivering 40 A at 220 V. 10

OR

12. a) Derive the torque equation of a DC Motor and hence deduce the Torque-speed and torque-armature current characteristics of
- 1) a DC shunt motor
 - 2) a DC series motor. 10
- b) A DC Shunt Generator supplies 96 A at a terminal voltage of 200 V. The armature and shunt field resistances are 0.1Ω and 50Ω resp. The iron and mechanical losses are 2500 W. Find :
- 1) the emf generated
 - 2) copper losses
 - 3) mechanical efficiency
 - 4) overall efficiency. 10

Module – II

13. a) Draw the phasor diagram of a transformer under lagging load condition. Write all the related equations. 10
- b) A 6 pole, 50 Hz, 3 phase Induction Motor runs at 960 rpm. when the torque on the shaft is 200 Nm. If the stator losses are 1500 W and mechanical losses are 500 W, find : 1) rotor copper loss and 2) efficiency of the motor. 10

OR

14. a) Explain the working operation of a 3 phase Induction Motor. 10
- b) A 40 kVA transformer has iron loss of 450 W and full load copper loss is 800 w. Find the efficiency at full load and half load at 0.8 pf lagging. 10

Module – III

15. a) Explain the working of a Universal motor. 10
- b) Derive the emf equation of an Alternator. 10
- OR
16. a) Explain why a single phase Induction Motor is not self starting. Mention the methods for starting. 10
- b) Write short note on Stepper Motor. 10