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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**

P.T.O.

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 0.5 Ω 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 0.1 Ω and 50 Ω 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**