M 21811

Reg. No. : .....

Name : .....

Third Semester B.Tech. (Reg./Supple./Improv.) (Including Part Time) Degree Examination, November 2012
(2007 Admn. Onwards)
PT2K6/2K6 EC/AEI 303 : ELECTRICAL ENGINEERING

Time: 3 Hours Max. Marks: 100

Instruction : *Answer* ***all*** *questions.*

PART – A

I. a) Explain the concept of load sharing between two generators.
b) Derive an expression for torque in D. C. Motor.
c) Derive the e.m.f. equation of transformer.
d) What are the lones intransformer ? How do they vary with load ?
e) Explain the effects of harmonics on pitch factor and distribution factor.
f) Write a note on synchronous condenser.
g) Write a note on types of 3 phase induction motor.
h) Explain the working of shaded pole type motor. **(8×5=40)**

PART – B

II. a) Give the power flow diagram of a D.C. generator. Write a note on losses in D. C. Generator. **8**

b) A 4 pol. lop wound d. c. generator has a useful flux per pole of 0.07 weber. The armature winding consists of 220 turns, each of 0.004Ω resistance. Calculate the terminal voltage when running 900 r.p.m. if the armature current is 50 A. **7**

OR

c) Explain the performance characteristics of D. C. series motor. **8**

d) A 220 volts, 15 kW, 850Ω r.p.m. d.c. motor drawn 72.2 A when operating at rated conditions. The unistances of the armature and shunt field are 0.25Ω and 100Ω respectively. Determine the percentage reduction in the field flux in order to obtain a speed of 1650 r.p.m. when the armature. Current drawn in 40 A. **7**

P.T.O.

III. a) With diagrams, explain o.c. and S.C. tests on single phase transformers. **8**

b) A 40 KVA distribution transformer has iron loss of 500 watts and full load copper loss of 500 watts. The transformer is supplying a lighting load (unity P.F.) The load cycle is an under full load for 4 hours, half load for 8 hours and no load for 12 hours. Find the all day efficiency of the transformer. **7**

OR

c) What are the conditions for connecting two transformers in parallel ? Explain the parallel operation of two single phase transformers. **8**

d) With diagrams, explain different 3 phase transformer connections. **7**

IV. a) Explain M.M.F. method of finding out regulation of an alternator with a neat circuit diagrams. **8**

b) A 1500 KVA, 6600 volts, 3 phase star-connected alternator with a resistance of 0.4Ω and reactance of 6Ω per phase delivers full load current at power factor 0.8 lagging and normal rated voltage. Estimate the terminal voltage for the same excitation and load current at 0.8 P.F. leading. **7**

OR

c) Explain the starting methods of synchronous motor. **8**

d) A 3 phase, 6000 KW, 4KV, 180 r.p.m. 50 Hz synchronous motor has per phase synchronous reactance of 1.2Ω. At full load, torque angle is 20° electrical. If the generated back e.m.f. per phase is 2.4KV, calculate the mechanical power developed. **7**

V. a) Draw the equivalent circuit of a 3 phase induction motor. Explain its parameters. **8**

b) An 8 pole, 3 phase, 50Hz, Induction motor has a rotor resistance of 0.025Ω/ phase and rotor standstill reactance of 0.1Ω/phase. At what speed is the torque maximum ? What proportion of maximum torque is the starting torque ? **7**

OR

c) With diagrams, explain the double field revolving theory for single phase induction motor. **8**

d) Write a note on classification of stepper motor. Mention its field of applications. **7**