V61/T11034/EE/20160714

Time : 3 Hours **Marks : 80**

Instruction :

1. All Questions are Compulsory.
2. Each Sub-question carry 5 marks.
3. Each Sub-question should be answered between 75 to 100 words. Write every questions answer on separate page.
4. Question paper of 80 Marks, it will be converted in to your programme structure marks.

1. Solve any **four** sub-questions.

   a) Derive an EMF equation of alternator. 5

   b) Explain the effect of armature reaction on alternator. 5

   c) Explain the three dark lamp method of parallel operation of alternator. 5

   d) A100KVA ,3000V,50HZ, three phase star connected alternator has armature resistance of 0.2 ohm. The field current of 40A produced short circuit current of 200A and an open circuit emf of 1040V. Calculate the voltage regulation at 0.8 p.f. lagging and 0.8p.f. leading. 5

   e) Explain different types of alternator windings. 5

2. Solve any **four** sub-questions.

   a) Explain any one starting method of synchronous motor. 5

   b) Explain V curve and inverted V curve of synchronous motor. 5

   c) Explain the phenomenon hunting in synchronous motor and how to prevent hunting. 5

   d) Explain the application of synchronous motor. 5

   e) A 400V, 50Hz, 37.5KW three phase star connected synchronous motor has full load efficiency 88%. Zs=0.2+j16 per phase if the excitation of motor is adjusted to have leading p.f. of 0.8. Calculate excitation emf and total mechanical power developed. 5

3. Solve any **four** sub-questions.

   a) Why induction motor is called as rotary transformer. 5

   b) Explain torque slip characteristic of three phase induction motor. 5

   c) Derive an expression for torque of three phase induction motor. 5

d) A12 pole, 50HZ, three phase induction motor has rotor resistance of 0.15 ohm and standstill reactance 0.25 ohm on full load motor is running at 480 RPM the rotor induced EMF per phase is 32 volt then calculate starting torque, full load torque, maximum torque, and speed at maximum torque. 5

e) State various speed control method for three phase induction motor. 5

4. Solve any **four** sub-questions.

a) Explain no load test of three phase induction motor. 5

b) Explain with neat sketch capacitor-start, capacitor-run induction motor. 5

c) Explain double revolving field theory of single phase induction motor. 5

d) State various starter for three phase induction motor. Explain any one starter for three phase induction motor. 5

e) Explain why single phase induction motor has zero starting torque? 5