ELECTRICAL MACHINES-II

5TH Exam/Elect./EEE / 0529 /0452/May-2015

Duration: 3hrs. M.Marks: 75 Section-A Q1. Fill in the blanks: (15x1=15)i. The speed of a synchronous machine is given by the expression, Ns= The armature core of a synchronous machine is made of_____ ii. The distribution factor of a concentrated winding is_____ iii. The rating of an alternator is given in iv. An over excited synchronous motor running at no load is called V. vi. The speed regulation of a synchronous motor is vii. The direction of rotation of a 3 phase induction motor con be revered by viii. The frequency of rotor currents of 3 phase induction motor is given by the expression f. = ix. Double cage induction motors have _____ starting torque. The induction motor having wound type rotor are known as_____ induction motors. Х. xi. The single-phase induction motor with single winding develops starting torque. xii. The shading ring of shaded pole motor is made of xiii. Universal motors are used in xiv. The direction of rotation of a split phase induction motor can be reversed by interchanging xv. The motor in which the rotor turns in discrete movements is called a Section-B

Q2. Attempt any six questions:

- i. Write the advantage of rotating field system over stationary field system used in synchronous machines.
- ii. Derive an equation for e.m.f. induced in synchronous machines.
- iii. What are the necessary conditions for parallel operation of alternators?
- iv. Calculate the no load terminal voltage for a 3-phase, 10 pole, 50hz,star connected alternator having 120 slots, 4 conductors per slot, coil span of 150 electrical, flux per pole 0.7wb distributor sinusoidally.
- v. Enlist various losses occurring in a 3-phase induction motor and also draw a power flow diagram for it.
- vi. Derive an equation for torque developed by an induction motor.
- vii. Compare squirrel cage induction motor with the phase wound induction motor.
- viii. Explain the construction and working of a shaded pole motor.
- ix. Explain in brief how the linear induction motor works.

Section-C

Q3. Attempt any three questions:

- i. Explain the construction of a synchronous machine with the help of a neat sketch.
- ii. (a) Draw and explain v-curves for synchronous motors.(b) Explain various methods of starting of synchronous motors.
- iii. Why starters are used to start induction motors? Explain the construction and working of D.O.L. starters.
- iv. (a) Explain the construction and working of a capacitor start motor.
 - (b) Explain the construction and working of a reluctance start motors.
- v. (a) Describe the construction and working of permanent magnet stepper motor.
 - (b) A 400 pole 4 pole, 50hz, 3 phase induction motor develops 10 HP including mechanical losses when running at 1440rpm, the power factor is 0.8 lagging. Calculate the slip and rotor

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(6x5=30)

(3x10=30)