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BIEE-028

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI) / ADVANCED LEVEL CERTIFICATE COURSE IN ELECTRICAL ENGINEERING (ACELVI)

00866

Term-End Examination

June, 2015

BIEE-028 : ELECTRICAL MACHINES THEORY – II

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Use of scientific calculators is permitted.*

1. Write short notes on any ***two*** of the following : *2×7=14*

(a) Damper Windings

(b) Crawling and Cogging

(c) Autotransformer Starter for 3-ϕ Induction Motor

2. (a) Discuss the Synchronous Impedance method for determination of voltage regulation of an alternator. 7

(b) Explain the working of synchronous motor as a synchronous condensor. 7

3. (a) Explain the parallel operation of alternators in detail. 7

(b) A 3-ϕ, 415 V, 6-pole, 50 Hz, Y-connected synchronous motor has an emf of 520 V (L – L). The stator winding has a synchronous reactance of 2 Ω/phase. The motor develops a torque of 220 N-m. Calculate the current drawn from the supply. 7

4. (a) Draw and explain the torque-slip characteristic of a 3-ϕ induction motor for (i) motoring mode, (ii) generating mode, and (iii) braking mode. 7

(b) From the Equivalent circuit of a 3-ϕ induction motor, with neglecting the stator resistance, obtain the relation 7

$$\frac{I_{2sT}}{I_2} = \sqrt{\frac{s^2 + s_{mT}^2}{s^2(1 + s_{mT}^2)}}.$$

5. (a) Explain the speed control methods of polyphase induction motor. 7

(b) A squirrel cage induction motor has a full load slip of 0·05. The motor starting current at rated voltage is 6 times its full-load current. Find the tapping on the auto-transformer starter which would give full-load torque at start. 7

6. (a) Discuss capacitor split-phase starting of a 1-ϕ induction motor using connection diagram and torque-speed characteristic. 7

(b) Explain the working principle of Hysteresis motor using B-H characteristic and magnetic field distribution diagram. 7

7. (a) Discuss the construction and principle of operation of a stepper motor with suitable diagrams. 7

(b) Enumerate the merits and demerits of Servo motors. 7