

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

Term-End Examination

June, 2014

BIEE-028 : ELECTRICAL MACHINE THEORY – II

Time : 2 hours

Maximum Marks : 70

Note : *Attempt any four questions out of 2 to 8. Q. No. 1 is compulsory. All questions carry equal marks.*

1. (a) What will be the frequency of voltage generated by an alternator having 8-poles and 250 r.p.m. speed ?
- (b) Two alternators are running in parallel. If the driving force of both the alternators is changed, this will change in
 - (i) frequency
 - (ii) back emf
 - (iii) generated voltage.
- (c) The rating of generators is expressed in terms of kVA. (True/False)

- (d) The speed regulation of a 3-phase synchronous motor is
- (i) 5%
 - (ii) 1%
 - (iii) 0.5%
 - (iv) 0%
- (e) In which method of starting an induction motor is it expected to take largest starting current ?
- (i) DOL starting
 - (ii) Stator-rotor starting
 - (iii) Star-delta starting
 - (iv) Auto-transformer
- (f) In a 4-pole, 3-phase, 50 Hz induction motor running at 1450 r.p.m., the percentage slip is _____ .
- (g) The frequency of the induced emf in the rotor of a 3-phase induction motor is maximum at
- (i) standstill
 - (ii) full load
 - (iii) no load
 - (iv) full torque.

7×2=14

2. (a) Draw and explain the 'V-curve' of a 3-phase synchronous motor. 7
- (b) Derive the emf equation for a 3-phase synchronous generator. 7
3. (a) Discuss the effect of variation of rotor resistance and supply voltage on the torque-slip characteristics of a 3-phase induction motor. 7
- (b) Explain rotating magnetic field in a 3-phase induction motor. 7
4. (a) A 50 Hz, 4-pole, 3-phase induction motor has rotor current frequency of 2 Hz. Obtain slip and speed of motor. 7
- (b) What are the advantages of wound rotor over squirrel cage rotor in case of 3-phase induction motor? 7
5. A 4-pole, 50 Hz, star-connected alternator has a flux per pole of 0.12 Wb. It has 4 slots per pole per phase, conductors per slot being 4. If the winding coil span is 150° , find the emf. 14
6. State the various methods of starting of a 3-phase induction motor. Explain with the help of diagram the working of star-delta starter. 14

7. (a) Describe the methods to control the speed of 3-phase induction motors. 10
- (b) What is cogging and crawling? 4
8. (a) Single-phase induction motor is not self-starting. Explain by the double revolving field theory. 7
- (b) Explain the working of stepper motor. 7
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