

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

00035 **Term-End Examination**
December, 2014

BIEE-028 : ELECTRICAL MACHINES THEORY – II

Time : 2 hours

Maximum Marks : 70

Note : *Question no. 1 is compulsory. Attempt any 4 questions out of 2 to 8. All questions carry equal marks.*

1. (a) An alternator is said to be over-excited when it is operating at
 - (i) unity p.f.
 - (ii) leading p.f.
 - (iii) lagging p.f.
 - (iv) None of the above
- (b) The rotor of a salient pole alternator has 24 poles. The number of cycles of e.m.f. in one revolution is _____ .
- (c) A synchronous motor has small starting torque. (True/False)

- (d) An induction motor when started on load, does not accelerate upto full speed but runs at $\frac{1}{7}$ th normal speed. The motor is said to be _____ .
- (e) Why is the number of stator slots in an induction motor not an exact multiple of the number of rotor slots ?
- (f) Which of the following single phase motors will operate at high power factor ?
- (i) Shaded pole motor
 - (ii) Capacitor run motor
 - (iii) Split-phase motor
 - (iv) Capacitor start motor
- (g) Which motor has unsymmetrical rotor ?
- (i) Universal motor
 - (ii) Shaded pole motor
 - (iii) Split-phase motor
 - (iv) Reluctance motor

7×2=14

2. Explain the following :

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- (a) Synchronous motor always runs at synchronous speed.
- (b) Field winding of synchronous generator is placed on rotor.

3. Derive and draw the torque-slip characteristics of a 3-phase induction motor. Show the braking and generating regions, explaining the particular values of slips in these two regions.

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4. (a) Why should the auxiliary winding be disconnected in a capacitor-start motor after the motor has picked up speed? 7
- (b) Describe the shaded-pole method of starting a single phase induction motor. 7
5. Write short notes on the following : 14
- (a) AC servo motor
- (b) Double revolving field theory
6. The power input to a 3-phase induction motor is 50 kW and corresponding stator losses are 2 kW. Calculate
- (i) the total mechanical power developed and rotor copper loss when the slip is 3%.
- (ii) the efficiency of the motor. 14
7. A 3-phase synchronous motor absorbing 60 kW is connected in parallel with a factory load of 240 kW having a lagging power factor of 0.8 . If the combined load has a p.f. of 0.9, what is the value of the leading KVAR supplied by the motor and at what power factor is it working? 14
8. What are the different types of 3-phase induction motors ? Enumerate the merits and demerits of each of these. 14
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