

**B. Tech. - VIEP - ELECTRICAL ENGINEERING  
(BTELVI)**

**Term-End Examination**

**June, 2016**

00666

**BIEE-011 : ELECTRICAL MACHINES - II**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Attempt any **seven** questions. All questions carry equal marks.*

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1. Derive the EMF equation for a synchronous motor and explain the meaning of
  - (a) Distribution factor
  - (b) Coil span factor10
  
2. Why is a synchronous motor not self-starting ? What methods are generally used to start synchronous machines ? Explain any two with suitable diagrams. 10
  
3. Explain the power flow diagram of a three-phase induction motor. 10

4. (a) What are the applications of synchronous motors ? 5
- (b) A 3-phase synchronous motor of 8000 watt, 1100 V has synchronous reactance of  $8 \Omega$  per phase. Find the minimum current and the corresponding induced emf for full load conditions. The efficiency of the machine is 0.8. Neglect armature reactance. 5
5. Draw and explain the phasor diagram of a salient pole synchronous motor for the following : 10
- (a) Lagging power factor
- (b) Leading power factor
- (c) Unity power factor
6. Explain the procedure of drawing the circle diagram of an induction motor. What information can be drawn from the circle diagram ? 10
7. Explain the two-reaction theory as applied to salient pole synchronous machines and draw its phasor diagram for lagging power factor. 10
8. Describe with constructional diagrams the working of any *two* of the following : 10
- (a) Direct on-line starter
- (b) Slip ring motor starter
- (c) Auto transformer starter

9. Explain the principle of operation and constructional details of slip ring and squirrel cage induction motors. 10

10. Write short notes on any *two* of the following : 2×5=10

- (a) Universal Motor
  - (b) Permanent Magnet Type Stepper Motor
  - (c) Brushless DC Motor
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