

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

00774 **Term-End Examination**
June, 2014

BIEEE-003 : SPECIAL ELECTRICAL MACHINES

Time : 3 hours

Maximum Marks : 70

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

1. Explain the characteristics and applications of the single-phase capacitor induction motor. Explain the torque-speed characteristics of three-phase induction motor. 10

2. A 3-phase induction motor, driving a constant torque load, is connected to constant-frequency voltage source. Explain why with reduction in supply voltage, the stator current increases. 10

3. Explain the static Kramer's scheme for slip power recovery in wound rotor induction motors with the help of neatly labelled diagram. 10

4. The rotor of a 4-pole, 50 Hz slip ring induction motor has a resistance of 0.3Ω per phase and runs at 1440 rpm at full load. Calculate the external resistance per phase which can be added to lower the speed to 1320 rpm (the torque being the same as before). 10

5. Derive the torque equation of Switch Reluctance Motor. Also, discuss the mechanical characteristics of Switch Reluctance Motor. 10
 6. Explain the constructional features and principle of operation of hybrid stepper motors. 10
 7. Discuss the double-field revolving theory for single-phase induction motors. 10
 8. What are the applications of Permanent Magnet Stepper Motor ? Clearly explain the differences between Synchronous Reluctance Motor and Permanent Magnet Stepper Motor. 10
 9. Discuss the construction and operation principle of linear induction motors. Where are these types of motors used ? Also give their applications. 10
 10. Write short notes on any *two* of the following : $5+5=10$
 - (a) Shaded pole motors
 - (b) Universal motors
 - (c) AC servomotors
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