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BIEEE-003

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

Term-End Examination

00306

June, 2015

BIEEE-003 : SPECIAL ELECTRICAL MACHINES

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions in all. Use of scientific calculator is permitted.*

1. Explain the construction and principle of operation of a hybrid stepper motor. Also state the advantages and disadvantages of hybrid stepper motors. *10*

2. (a) In a wound type induction motor, explain how constant power and constant torque operation is achieved by static slip power recovery.

(b) Explain the method of speed control of induction motor using variable frequency technique. Bring out the relevant merits and demerits of this method. *2×5=10*

3. (a) Sketch and explain the torque-speed curve of a conventional induction motor and indicate how it will change when rotor resistance is doubled keeping stator voltage and frequency unchanged.

(b) Discuss whether a DC series motor can be operated with an AC supply. Validate your answer with reason. *2×5=10*

4. Draw the constructional diagram of a switched reluctance motor and explain its principle of operation with various modes of operation. *10*

5. Give the constructional features, working and application of a single phase hysteresis motor. *10*

6. (a) Discuss how speed of a polyphase induction motor can be controlled by injecting a voltage in rotor circuit of polyphase induction motor.

(b) Explain the salient features of a permanent magnet generator. *2×5=10*

7. (a) Discuss the various methods of starting of a single phase induction motor.

(b) Explain the construction and principle of operation of a Brushless DC motor with the help of its driver circuit. *2×5=10*

8. Explain the principle of operation of a Linear Induction Motor (LIM). Give the applications of linear induction motor. *10*

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

   (a) Single phase synchronous motor

   (b) Universal motor

   (c) Slip power recovery control scheme of three-phase induction motor