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

Term-End Examination

June, 2019

BIEEE-003 : SPECIAL ELECTRICAL MACHINES

Time : 3 hours   *Maximum Marks : 70*

Note :   *(i) Answer **any five** questions.*

   *(ii) **All** questions carry **equal** marks.*

   (iii) Use of scientific calculator is allowed.

1. (a) Explain slip power recovery control schemes (constant torque and constant power) with the help of suitable diagrams.   **10**

   (b) Explain the significance of double cage rotor.   **4**

2. (a) Explain the construction and working of single phase induction motor with neat schematic diagram.   **10**

   (b) Explain why single phase induction motor is not self starting.   **4**

3. (a) Explain the construction and working of a two phase a.c. servomotor with the help of suitable diagrams.   **10**

   (b) What are the application of a servo motor ?   **4**

4. (a) Differentiate between a switched reluctance motor and a variable reluctance stepper motor.   **7**

   (b) Draw and explain the torque-speed characteristics of a hysteresis motor.   **7**

5. (a) Name different types of permanent magnets and explain their magnetization characteristics. 7

   (b) The power input to a 3 phase induction motor is 60 kW. The stator loss total is 1kW. Find the mechanical power developed and the rotor copper loss per phase if the rotor is running with a slip of 3%. 7

6. (a) Explain the construction, principle of operation and characteristics of a universal motor with the help of suitable diagrams. 10

   (b) What are the important features and applications of a brushless d.c. motor ? 4

7. Write short notes on **any two** of the following :
   (a) PCB motors   7+7=14
   (b) Hybrid stepper motor
   (c) Shaded pole motor
   (d) Repulsion motor