No. of Printed Pages : 3

BIEE-011

01173

B.Tech. ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

December, 2012

BIEE-011 : ELECTRICAL MACHINES - II

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any seven** questions.*

1. (a) Describe the difference in construction of rotors of alternators used in hydroelectric plants and steam plants. 3

(b) Derive emf equation of an alternator with distribution and coil span factor. 7

2. Explain Blondel's Two-reaction theory. 10

3. Explain the synchronous impedance method of determining the voltage regulation of an alternator. Why this method is considered as pessimistic method ? 10

4. (a) Why synchronous motor is not self starting ? What methods are generally used to start synchronous motors ? 5

(b) What are V-curves of a synchronous motor ? State its significance. 5

5. (a) Show that in a 3 phase induction motor with negligible stator impedance, maximum torque is developed at slip $s = R_2/X_2$. Where R_2 and X_2 are rotor resistance and standstill reactacne respectively. 5

(b) The full-load speed of an 8-pole, 50Hz slip ring motor is 730 rpm. The rotor resistance per phase is 0.2Ω. Calculate the external resistance per phase that must be added to lower the speed to 620 rpm. given that the torque is same in the two cases. 5

6. What is the need of starter in 3-phase induction Motor ? Give the names of different methods for the starting of 3-phase induction motor. Explain any two methods in detail. 10

7. (a) Discuss why single phase induction motor does not have a starting torque. 4

(b) Describe with diagrams and phase diagrams two methods of producing starting torque in a single phase induction motor. 6

8. A 22V, single phase induction motor gave the following test results: Blocked-rotor test : 120V, 9.6A, 460W No-load test : 220V, 4.6A, 125W The stator winding resistance is 1.5Ω and during the blocked rotor test, the starting winding is open. Determine the equivalent circuit parameters. 10

9. Draw and explain the operation of AC series motor with pharos diagram. 10

10. Write short notes on ***any two*** of the following. 10

(a) Brushless DC motor

(b) Repulsion motor

(c) Parallel operation of alternators.