| BIEE-011 |

B.Tech. ELECTRICAL ENGINEERING

Term-End Examination

June, 2012

01045

BIEE-011 : ELECTRICAL MACHINES - II

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any seven questions. All questions carry equal marks. All questions are to be answered in English language only. Use of calculator is permitted.*

1. Explain Blondels's Two reaction theory applicable 10 to salient pole synchronous machine.

2. Explain the different method of starting of 10 synchronous motor. Also give the applications of synchronous motor.

3. Give the construction detail of rotor of salient pole. 10 Also draw and explain the equivalent circuit diagram and phasor diagram of a synchronous machine.

4. What is the need of parallel operation of **10** alternators ?

Two exactly similar turbo alternators are rated at 25 MW each. They are running in parallel. The speed-load characteristics of the driving turbines are such that the frequency of alternator 1 drops uniformly from 50 Hz on no load to 48 Hz on full load and that of alternator 2 from 50 Hz to 48.5 Hz. How will the two machines share a load of 30MW ?

5. Derive the relationship for torque developed by a **10** 3- phase induction Motor and deduce the condition for maximum torque.

6. Give the different types of single - phase Induction **10** Motor. Draw and explain the circuit diagram and working principle of capacitor start - capacitor run 1- phase Induction Motor.

7. A 24 pole, 50 Hz, star connected Induction Motor **10** has rotor resistance of 0.016Ω per phase and rotor reactance of 0.265Ω per phase at standstill. It is achieving its full load torque at a speed of 247 r.p.m. Calculate the ratio of
   (a) full load torque to maximum torque.
   (b) starting torque to maximum torque.

8. Explain the advantages of Squirrel cage induction **10** motor as compared to wound rotor induction motor. Calculate the reduction in starting current and starting torque when the supply voltage to a cage motor is 75 percent instead of 100 percent.

9. Discuss briefly the various method of speed **10** control of 3- phase induction motor with neat and suitable diagrams.

10. Write the short notes on *any two* of the following : **2x5=10**
    (a) Repulsion Motor.
    (b) Switched Reluctance Motor.
    (c) Stepper Motor of permanent Magnet type.