

## FACULTY OF ENGINEERING

B.E. III/IV Year (E &amp; EE) II Semester, (Main) Examination, May/June, 2011

## ELECTRICAL MACHINERY – III

Time : 3 Hours]

[Max. Marks : 75

*Answer all questions from Part A.**Answer any five questions from Part B.***Part A – (Marks : 25)**

1. What do you understand by fractional slot winding ? 2
2. What do you understand by synchronous impedance ? 2
3. What is short cut. ratio and what is its effect on suppli Generator performance ? 3
4. Why MMF method of finding voltage regulation is called optimistic method ? 3
5. What do you understand by Hunting and how it is prevented ? 3
6. What an V-Culues ? 2
7. What is the difference between  $X_d$  and  $X_q$  ? 3
8. Give applications of hystersis motor. 2
9. What is reluctance torque ? 3
10. What do you understand by servo motor ? What are its application ? 2

**Part B – (Marks : 50)**

11. A 3-phase star-connected alternator has an open circuit line voltage of 6599V. The armature resistance and synchronous questance are  $0.6\Omega$  and  $6\Omega$  per phase, respectively. Find terminal voltage and voltage regulation and  $\delta$  if load current is 180A a p.f. of (a) 0.9 lagging (b) 0.8 leading. 10
12. A 5 MVA, 10,000V, 1500 rpm, 3-phase 50Hz alternator is operating on infinit bus-bar. Find synchronising power per mechanical degree of angular displacement at (a) no-load, (b) full-load at rated voltage and 0.8 p.f. lagging. Take  $X_s$  as 20%. 10
13. A 3-phase star connectedd synchronous motor has a power input of 5472W at rated voltage.  $X_s = 10\Omega$ . If excitation voltage is adjusted clar to the rated voltage of 400v, find power angle, armature current are p.f. Neglect resistance.



14. Derive the phase diagram of cylindrical rotor alternator. What is the effect of armature reaction and how it is included in phasor diagram ? Draw phasor diagram for lagging, unity and leading p.f.s. 10
15. (a) Explain what is synchronous condenser. What is its application. 5  
(b) Explain methods of starting of Synchronous motor. 5
16. (a) Explain the operation of Hysteresis motor are give applications. 5  
(b) Explain the operation of repulsion motor are give applications. 5
17. Explain in detail construction, operation characteristics of two-phase servo motor. 10