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**Question Paper Code : 91208**

**B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

**Fifth Semester**

**Electrical and Electronics Engineering**

**080280039 – ELECTRICAL MACHINES - II**

**(Regulations 2008)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. What is armature reaction and What are its causes ?
2. What are the parameters obtained from Potier triangle in ZPF method ?
3. What are the advantages of synchronous motor ?
4. What are the causes for faulty starting of a synchronous motor ?
5. A 50 Hz, 6 pole three phase induction motor runs at 970 rpm find the slip.
6. What is the magnitude of the resultant flux of three phase rotating field ?
7. Draw the power stages of 3 $\phi$  induction motors.
8. What is cascade connection of three phase induction motor ?
9. Give the applications of single phase induction motor.
10. Write the working principle of reluctance motor.

**PART – B (5 × 16 = 80 Marks)**

11. (a) (i) From the first principles of an alternator, derive its emf equation. (8)  
(ii) An 11 kV, 1000 kVA, 3-phase Y-connected alternator has a resistance of 2 ohms per phase. Find the voltage regulation of the alternator for full load current of 0.8 p.f. lagging by Potier method. (8)

Field current (A) :	40	50	110	140	180
OCC line voltage :	5,800	7,000	12,500	13,750	15,000
Line volatage zero p.f. :	0	1,500	8,500	10,500	12,500

**OR**

- (b) Using slip test, explain the procedure of determining  $X_d$  and  $X_q$ . (16)

12. (a) (i) Describe with neat diagrams, the principle of working of a Synchronous motor. (8)
- (ii) Describe the effect of excitation on armature current and power factor by drawing V and inverted V curves. (8)

OR

- (b) (i) Describe the Phenomenon of hunting and its suppression in a Synchronous motor. (6)
- (ii) Derive the expression for power developed by a Synchronous motor with relevant phasor diagram. And also derive the conditions for maximum power developed. (10)
13. (a) Describe the test required and necessary procedure to draw and calculate the performance of three phase induction motor. (16)

OR

- (b) (i) Draw and explain slip-torque characteristics of three phase induction motor. (8)
- (ii) The power input to the rotor of a 400 V, 50Hz, 6 pole, 3-phase induction motor is 20 kw, the slip is 3% calculate the
- (1) Frequency of rotor currents
  - (2) Rotor speed
  - (3) rotor cu losses and
  - (4) rotor resistance per phase if rotor current is 60A. (8)
14. (a) (i) Discuss the various speed control of 3 $\phi$  induction motor from rotor side. (16)
- (ii) List out different starters used for starting of 3 $\phi$  induction motors.

OR

- (b) (i) Explain the working principle of star/delta starting method of 3 $\phi$  induction motor. (16)
- (ii) Explain the speed control of 3 $\phi$  slip ring induction motor by Scherbius drive.
15. (a) Write in detail about the principle and operation of shaded pole induction motor. (16)

OR

- (b) Explain about the construction and operation of stepper motor. (16)