B.E. DEGREE EXAMINATION, NOV/DEC – 2012

V SEMESTER

ELECTRICAL AND ELECTRONICS ENGINEERING

EE 9304 ELECTRICAL MACHINES II

Time: 3 Hours   Max. Marks: 100

Answer all questions

PART- A (10 X 2 = 20)

1. What is the effect of adding an external rotor circuit resistance on T_{max} and T_{st} in case of wound rotor type Induction motor?

2. What is called synchronous reactance?

3. At what speed a two pole alternator should run, to generate a 50 Hz voltage?

4. What is the significance of Universal motor?

5. Why are the synchronous motors not self-starting? How can we start it?

6. Why can't a three phase induction rotate at synchronous speed?

7. State the reasons for the drop of terminal voltage due to load in alternators? Under which condition the terminal voltage will rise on load?

8. Explain the phenomenon 'Crawling' and 'Cogging'

9. What do you mean by synchronous condenser? State the use of it.

10. What will be the effect of reversing the field polarity on the direction of rotation of a synchronous motor?

PART- B (5 X 16 = 80)

11. Explain any two methods of finding the regulation of a synchronous generator from the open circuit and short circuit characteristics.

12. a. Explain the construction and the principle of operation a 3- phase synchronous motor and draw its equivalent circuit. Also explain the operation of a synchronous motor at variable excitations with phasor diagrams.

(OR)

12. b. (i) Describe the two reaction theory of salient pole synchronous machine.

(ii) Explain the different methods of synchronization of an alternator with bus bar.

13. a. What is circle diagram? Explain the step by step procedure of drawing the circle diagram from the test data of a 3-phase induction motor and how to calculate its performance under different load conditions?

(OR)

13. b. Draw the approximate equivalent circuit of a 3 phase Induction motor and also explain the no load test and blocked rotor test to be conducted for finding the parameters of the equivalent circuit phase with neat circuit diagrams.

14. a. Explain the different methods of starting of 3-phase induction motor with neat circuit diagrams.

(OR)

14. b. Explain the speed control methods of 3-phase induction motor with neat circuit diagrams.

15. a. Explain the double revolving field theory of single phase induction motor. From the mathematical representation of double-revolving field theory, derive the expression for the total mechanical power output of the machine.

(OR)

15.b. Explain the construction and working principle of any two different types of fractional power motors with neat sketches.