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Question Paper Code: 44032

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fourth Semester

Electrical and Electronics Engineering

14UEE402 - AC MACHINES

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- The starting torque of a simple squirrel-cage motor is
 - Low
 - Increases as rotor current rises
 - Decreases as rotor current rises
 - High
- Which of the following quantity in Squirrel Cage Induction motor does not depend on its slip?
 - Reactance
 - Speed
 - Induced emf
 - frequency
- No load test is conducted at
 - High voltage
 - Rated current
 - High current
 - Rated voltage
- An Induction motor has a I_{SC} current 7 times the I_{FL} and Full load slip of 4%. Its starting torque is _____ times the full load torque.
 - 7
 - 1.96
 - 4
 - 49

5. Which kind of rotor is most suitable for turbo alternators which are designed to run at high speed?

(a) Salient pole type	(b) Non-salient pole type
(c) Both (a) and (b)	(d) None of these

6. A 50 Hz alternator will run at greatest possible speed if it is wound for _____ poles.

(a) 8	(b) 6	(c) 4	(d) 2
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7. The maximum power developed in the synchronous motor will depend on

(a) Rotor excitation only
(b) Maximum value of coupling angle
(c) Supply voltage only
(d) Rotor excitation supply voltage and maximum value of coupling angle

8. A damper winding is provided in a Synchronous motor for

(a) Stabilizing rotor motion	(b) Suppress rotor oscillation
(c) Develop necessary Starting Torque	(d) Both (b) and (c)

9. Out of the following motors, which will give the highest starting torque?

(a) Universal motor	(b) Capacitor start motor
(c) Shaded pole motor	(d) All have zero starting torque

10. One of the characteristics of single phase Induction Motor is

(a) Self-Starting	(b) Not Self-Starting
(c) Requires one winding only	(d) Can rotate in one direction only

PART - B (5 x 2 = 10 Marks)

11. A 50 Hz, 6 pole, 3-phase induction motor runs at 970 rpm. Find slip?
12. Give reasons for a three phase motor failing to start.
13. What is meant by armature reaction in alternators?
14. Give the disadvantages of synchronous motor.
15. List the applications of single phase induction motor.

PART - C (5 x 16 = 80 Marks)

16. (a) How the losses and efficiency of three phase induction motor can be calculated. Illustrate with necessary diagram and equations. (16)

Or

- (b) (i) Derive an expression for the torque of an induction motor and obtain the maximum torque. (8)
(ii) Derive the torque slip characteristics of three phase induction motor and explain. (8)

17. (a) Explain the main methods of electrical braking of induction motors. (16)

Or

- (b) (i) Explain the tests required to be performed to obtain the data for the circle diagram and give the steps to draw the circle diagram. (8)
(ii) Describe in detail the braking methods of three phase induction motor. (8)

18. (a) Write the procedure for finding voltage regulation of alternator using synchronous impedance method. (16)

Or

- (b) Explain the determination of direct and quadrature axis synchronous reactance using slip test. (16)

19. (a) (i) Define Hunting. (6)
(ii) Methods of starting synchronous motor. (10)

Or

- (b) Explain the effect of armature current and power factor of Synchronous motors. (16)

20. (a) Explain why single phase induction motor is not self starting using Double field revolving theory. (16)

Or

(b) Explain double field revolving theory and cross field theory. (16)
