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Question Paper Code: 44302

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

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 power factor of a Squirrel Cage Induction motor is
 - Low at light loads only
 - Low at heavy loads only
 - Low at light and heavy loads
 - Low at rated load only
- Which of the following quantity in Squirrel Cage Induction motor does not depend on its slip?
 - Reactance
 - Speed
 - Induced emf
 - frequency
- 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
- A 3-phase, 4-pole, 50Hz induction motor runs at a speed of 1440 rpm. The rotating field produced by the rotor rotates at a speed of
 - 1500
 - 1440
 - 60
 - 0

5. In a synchronous machine, if the field flux axis is ahead of armature field axis in the direction of rotation , the machine operating is
- (a) Synchronous motor (b) Synchronous generator
(c) Asynchronous motor (d) Asynchronous generator
6. In a synchronous generator, delivering lagging power factor load
- (a) The excitation emf leads terminal voltage by the power angle
(b) The excitation emf lags terminal voltage by the power angle
(c) The excitation emf leads terminal voltage by the power factor angle
(d) None of these
7. Synchronous motor can operate at
- (a) Lagging power factor only
(b) Leading power factor only
(c) Unity power factor only
(d) Lagging, leading and unity power factor only
8. When a synchronous motor is started, the field winding is
- (a) short circuited (b) open- circuited
(c) excited from dc source (d) excited from three phase ac source
9. Which type of motor suitable for a computer printer drive?
- (a) Reluctance motor (b) Hysteresis motor
(c) Shaded pole motor (d) Stepper motor
10. In a single phase repulsion motor power factor is
- (a) Always leading (b) High at low speed
(c) High at high speed (d) Always unity

PART - B (5 x 2 = 10 Marks)

11. What is meant by plugging?
12. Give reasons for a three phase motor failing to start.
13. What are the methods for determining voltage regulation of an alternator?
14. Name the torques of a synchronous motor.
15. What is universal motor?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the principle of operation of three phase induction motor with neat diagram. Also derive the torque equation. (16)

Or

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

17. (a) Explain the working of any three starters employed for three phase induction motor. (16)

Or

- (b) Explain the main methods of electrical braking of induction motors. (16)

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

Or

- (b) Write short notes on:

(i) V-curves of synchronous motor. (8)

(ii) Synchronous condenser. (8)

20. (a) Prove that single phase induction motor is not self starting. (16)

Or

- (b) With neat diagram explain the working of any four types of single phase induction motor. (16)

