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Question Paper Code: 41342

B.E. / B.Tech. DEGREE EXAMINATION, MAY 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)

- Under which of the following starting methods, an induction motor draws largest starting current
 - Star - delta starting
 - Auto transformer starting
 - Direct - on- line starting
 - Reduced voltage starting
- In a three phase induction motor, the max torque
 - Is proportional to rotor resistance r_2
 - Does not depend on r_2
 - Is proportional to $\sqrt{r_2}$
 - Is proportional to $(r_2)^2$
- The speed of a three phase induction motor will increase, if the
 - number of poles of the stator winding is increased
 - No of poles of the stator winding decreased
 - Frequency of the stator supply is decreased
 - Resistance of the rotor circuit is increased
- If a three phase induction is to be operated on unbalanced power supply, then it should be operated at
 - Higher loads
 - Lower loads
 - Higher speeds
 - Lower speeds

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. A synchronous motor is operating with normal excitation , with the increase in load the armature current drawn from the supply main increases due to
 - (a) Increase in back emf
 - (b) Fall in motor speed
 - (c) Increase in resultant voltage across the armature
 - (d) Increase in power factor

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. Define slip and frequency of rotor current in three phase induction machines?.
12. Define crawling and cogging.
13. Define hunting of alternator.
14. Give the disadvantages of synchronous motor.
15. Name the starting methods of single phase induction 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 starting of induction motors using star- delta starter with necessary diagram and also mention the precaution with star- delta starter. (16)

Or

- (b) Explain the main methods of electrical braking of induction motors. (16)
18. (a) Derive the emf equation of Synchronous Generator. (16)

Or

- (b) Explain the two reactance concept for salient pole synchronous machine with neat diagram. (16)
19. (a) Derive the torque equation of synchronous motor. (16)

Or

- (b) Explain the effect of armature current and power factor of Synchronous motors. (16)
20. (a) Prove that single phase induction motor is not self starting. (16)

Or

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