

25/4/19
B.E / B.Tech (FT /) END SEMESTER EXAMINATIONS – APRIL / MAY 2019

ELECTRICAL AND ELECTRONICS ENGINEERING

Semester V

EE8502 ELECTRICAL MACHINES II

(Regulation 2012)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

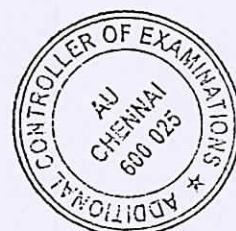
1. Define pitch factor of a distributed three phase armature winding.
2. If the angular frequency of a 4 P synchronous motor's excitation is 377 rad/sec then calculate its angular velocity in rad/sec.
3. What is called hunting in a synchronous machine?
4. While conducting the slip test the synchronous machine is made to run at a speed slightly less than synchronous speed. Why is it so?
5. Draw the torque Vs speed characteristics of squirrel cage induction motor.
6. Compute the input power of three phase induction motor if the air gap power is 3kW at an operating slip of 4% and an efficiency of 80%. Ignore the mechanical losses.
7. Suggest a suitable starting method for fractional horse power three phase induction motors.
8. Which method is to be adopted for getting maximum torque at starting?
9. State whether a stepper motor produces mutual or reluctance torque. Justify your statement.
10. State an application of the universal motor.

PART – B (5 x 16 = 80 Marks)

(Question No.11 is Compulsory)

11. (a). Discuss the step by step procedure of EMF method to compute the voltage regulation of an alternator. [8]
- 11.(b). Discuss the capability curves of synchronous generator. [8]
12. (a) Using phasor diagrams explain the V-curves and inverted V-curves of synchronous motor. [16]

(OR)



12.(b). With help of necessary phasor diagram describe the two reaction theory of three-phase salient pole generator and discuss the procedure to predetermine its voltage regulation. [16]

13 (a). From first principles explain the principle of operation the three-phase induction motor and derive the expressions for air gap torque and developed power. Also draw the complete speed torque characteristics for motoring, generating and braking regions. [16]

(OR)

13. (b). Explain the principle of operation of induction generator in separately excited mode of operation and design the capacitance value so as to build a three-phase capacitor bank. [16]

14. (a). The test data on a 208 V, 60 Hz, 4 pole, star connected three-phase induction motor rated at 1710 rpm are as follows: Stator resistance between any two terminals = 2.4Ω . No load test: 450 W, 1.562 A, 208 V. Blocked rotor test: 59.4 W, 2.77 A, 27 V. Friction and windage loss = 18 W. Compute the stator current, power factor and efficiency at rated load. [16]

(OR)

14. (b). Explain (i) the speed control method of three-phase induction motor, where load torque is to be kept constant and (ii) the starting method in which starting torque is equal to the maximum torque. [16]

15. a). With the speed torque curves explain the principle of operation of single phase induction motors of (i) split phase inductive start type and (ii) capacitor start and capacitor run. [16]

(OR)

15. b). Write short notes on (i) Reluctance motor and (ii) AC series motor. [16]

