

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2018 – 19 Examinations

Semester: 4
Subject Code: 03106252
Subject Name: Electrical Machines - II

Date: 01/05/2019
Time: 02:00 pm to 4:30 pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark) (15)

1. The starting torque of a 3-phase Induction motor can be increased by
 - (a) Increasing Slip
 - (b) Increasing Current
 - (c) Both (a) and (b)
 - (d) None of the above
2. A capacitor start, capacitor run single phase induction motor is basically a
 - (a) AC series motor
 - (b) DC series motor
 - (c) 2 phase induction motor
 - (d) 3 phase induction motor
3. The damping winding in a synchronous motor is generally used.
 - (a) to provide starting torque only
 - (b) to reduce noise level
 - (c) to reduce eddy currents
 - (d) to prevent hunting and provide the starting torque
4. The method which can be used for the speed control of induction motor from stator side is
 - (a) V / f control
 - (b) Controlling number of stator poles to control N_s
 - (c) Adding rheostats in stator circuit
 - (d) All of these
5. The power factor of an alternator depends on
 - (a) Load
 - (b) Speed of rotor
 - (c) Core losses
 - (d) Armature losses
6. In medium sized Induction motors, the slip is generally around _____ %
7. Define: Hunting in a Synchronous Machine
8. Define : Crawling and Cogging
9. Copper losses in a generator vary with load. (True / False)
- 10 In a synchronous motor, the angle between the rotating stator flux and rotor poles is known as _____ angle.
11. A two pole alternator running at 1500 rpm will generate emf at _____ Hz.

12. Rotor Rheostat control method of speed control is used for _____ motor.
13. In case of an alternator having negative regulation, the terminal voltage will rise kW output of the alternators _____. (Increase / Decrease)
14. What are the types of 3-phase Induction motor?
15. The starting torque of a capacitor start motor is : (High / Low)

Q.2 Answer the following questions. (Attempt any three) **(15)**

- A) Explain Double Field Revolving theory for Single phase Induction Motor.
- B) Explain different Starting methods of Synchronous Motor.
- C) Explain Short Circuit Ratio of a Synchronous Machine and it's Significance.
- D) Explain how a rotating magnetic field is produced when the stator of a three phase induction motor is supplied from a symmetrical three phase supply.

Q.3 A) A 500 V, 3 ϕ , 50 Hz induction motor develops an output of 15 KW at 950 r.p.m. If the input p.f. is 0.86 lagging, Mechanical losses are 7.30 W and stator losses 1500W, Find **(07)**

i) the slip
 ii) the rotor Cu loss
 iii) the motor input
 iv) the line current

B) What are the different methods to find out Voltage Regulation of a Synchronous Machine? Explain Synchronous Impedance method in details. **(08)**

OR

B) Explain the Armature reaction of a Synchronous machine and methods to compensate it in detail. **(08)**

Q.4 A) Explain Working principle, Construction and Application of following motors: **(07)**

(1) Split-phase Induction motor
 (2) Capacitor Start Induction motor.

OR

A) A 3-phase, wye-connected, round-rotor synchronous generator rated at 10 kVA, 230 V has a synchronous reactance of 1.2 Ω per phase and an armature resistance of 0.5 Ω per phase. Calculate the percent voltage regulation at full-load with 0.8 lagging power factor. **(07)**

B) Explain the Slip test for measurement of Direct axis and Quadrature axis reactance for salient Pole machine. **(08)**