

Electrical Machines-

Q.P. Code : 548301

(3 Hours)

[Total Marks : 60

- N.B. :** (1) Question No. 1 is **compulsory**
 (2) Figures to the right indicate **full marks**
 (3) Solve any **three** questions out of remaining **five** questions
 (4) Assume suitable data if necessary

1. Solve any **three**:-

15

- (a) A pole 3 phase, 50Hz induction motor runs at a speed of 1470 rpm speed. Find the frequency of the induced emf in the rotor under this condition.
 (b) State and explain voltage equations of a dc motor.
 (c) Define the slip of an induction motor explain its significance.
 (d) Explain the construction of permanent magnet synchronous motor.
 (e) Susitched reluctance motor.

2. (a) Derive the torque equation for a three phase induction motor. 7

(b) A 24 pole, 50Hz star connected induction motor has rotor resistance of 0.016Ω per phase and rotor reactance of 0.0265Ω per phase at standstill. It is achieving its full load torque at a speed of 247 rpm. Calculate the ratio of . 8

- (i) Full load torque to maximum torque
 (ii) Starting torque to maximum torque.

3. (a) State and explain voltage and current relations for long shunt compound motor and short shunt compound motor. 7

(b) A 230V dc shunt motor runs at 800rpm and takes armature current of 50A. Find resistance to be added to the field circuit to increase current of 80A. Assume flux proportional to field current. Armature resistance = 0.15Ω & Field resistance = 250Ω 8

4. (a) Explain the principle of operation of capacitor start and capacitor run single phase induction motor. along with the torque-slip characteristics and the applications. 8

(b) Explain the construction and working of bipolar brushless dc motor. 7

[TURN OVER

5. (a) Explain construction and working of multistack variable reluctance stepper motor. 7
- (b) Explain the construction and working of switched reluctance motor. 8

6. Write short notes on

- (a) DC series motor starter
- (b) Autotransformer starter
- (c) Split phase induction motor 15

muquestionpapers.com