

S.E (SEM-IV) (CBSSGS)

ETRX

ELECTRICAL MACHINES

DT 12/06/15'

QP Code : 3537

(3 Hours)

[Total Marks : 60

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

1. Solve any three:- 15
- (a) What is the difficulty in starting a dc motor without starter.
 - (b) A 6 pole, 3-phase induction motor is connected to 50Hz Supply. If it is running at 970 rpm. Find the slip.
 - (c) What is the principle of operation of shaded pole induction motor.
 - (d) What is the basic operating principle of d.c. stepping motors.
 - (e) State the types of synchronous motor.
2. (a) Explain the different methods of controlling speed of 8
- (i) DC shunt motor 7
 - (ii) DC series motor.
- (b) A 4-pole, 500V shunt motor has 720 wave connected conductors in the armature. The full load armature current is 60A and the flux per pole is .03 wb. The armature resistance is 0.2Ω and the contact drop is 1V per brush. Calculate the full load speed of the motor.
3. (a) Obtain the expression for full load torque of 3-ph. induction motor. Also obtain the condition for maximum torque under running condition and at starting 8
- (b) Write a short note on star-delta starter used for 3ph. induction motor 7
4. (a) A 4 pole, 250w, 115 V, 60Hz capacitor. start induction motor takes a full load line current of 5.3A while running at 1760rpm. If the full load efficiency of the motor is 64%. find 8
- (i) Motor slip
 - (ii) Power factor
 - (iii) Full load torque
- (b) What is the difference between the capacitor start motor and the capacitor start capacitor run induction motor. 7
5. (a) Explain construction and operation of variable reluctance stepper motor. 8
- (b) Classify unipolar brushless DC motor. and explain in detail unipolar brushless D.C. motor. 7
6. Write a short note on:- 15
- (a) Autotransformer starter for 3 phase induction motor.
 - (b) Draw and explain three point starter used for d.c. shunt motor.
 - (c) Explain the blocked rotor test for single phase induction motor.