

Total No. of Questions : 10]

SEAT No. :

P1325

[Total No. of Pages : 3

[4858] - 1062
T.E. (Electrical)
ELECTRICAL MACHINES - II
(2012 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of electronic pocket calculator is allowed.*
- 5) *Assume suitable data, if necessary.*

Q1) a) Compare salient pole type construction with nonsalient pole type construction for three phase alternator. **[4]**

b) A 550V, 55 KVA, 1 phase alternator has an effective resistance of 0.2Ω . A field current of 10A produces an armature current of 200A on short circuit and an electromotive force of 450V on open circuit. Calculate the voltage regulation at full load 0.8 pf lagging p.f. **[6]**

OR

Q2) a) Define voltage regulation of alternator. Draw the equivalent circuit of alternator. **[4]**

b) With neat diagram explain bright lamp method of synchronization of 3 phase alternators. **[6]**

Q3) a) A 400V 3 phase star connected synchronous motor has armature resistance of 0.2Ω /phase & synchronous reactance of 2Ω /phase. While delivering certain load it takes 25 Amp from supply. Calculate back emf induced in motor if it is working with – **[8]**

- i) 0.8 pf lag.
- ii) 0.9 pf lead.

b) Draw Vee and inverted Vee curve for synchronous motor at no load. **[2]**

OR

P.T.O.

Q4) a) With neat diagram explain slip test. How X_d and X_q can be determined? [6]

b) Define short circuit ratio in use of alternator. Elaborate its significance. [4]

Q5) a) What are different methods of controlling speed of 3 phase induction motor. Explain cascade control. [8]

b) Explain the construction & working of Linear Induction Motor. State its applications. [8]

OR

Q6) a) With neat diagram explain construction & working of Permanent Magnet Stepper Motor. [8]

b) Write short note on 3 phase induction voltage regulator. [8]

Q7) a) Explain the procedure to plot circle diagram of ac series motor. How speed scale can be determined. [8]

b) Explain the operation of dc series motor on AC supply. What are the problems associated with a.c. operation. [8]

OR

Q8) a) Explain the Conductively and Inductively compensated a.c. series motor. [8]

b) A universal motor has resistance of 30Ω and inductance of 0.5 H. When it is connected to 250V d.c. supply, it takes 0.8 Amp and runs at 2000 rpm. Determine the speed, torque and power factor when connected to 250V, 50Hz, AC. Supply and taking same current of 0.8 Amp. [8]

Q9) a) With neat diagram, explain the construction and working of split phase induction motor. Draw the phasor diagram & torque - speed characteristics of this motor. [10]

- b) A 1ph split phase induction motor has following details: [8]

Main winding impedance $Z_m = 4 + j7.5\Omega$

Auxiliary winding impedance $Z_a = 7.5 + j4\Omega$

Supply voltage = 230 V, 50Hz

- Calculate –
- i) Main winding current.
 - ii) Auxiliary winding current.
 - iii) Motor current.
 - iv) Power factor of the motor.

OR

- Q10)** a) With neat diagram, explain the construction and working of shaded pole Induction Motor. State applications of this motor. [10]

- b) With suitable diagram explain no load and blocked rotor test on single phase induction motor. How equivalent circuit parameters are obtained from these tests. [8]



