

Total No. of Questions : 10]

SEAT No. :

P1486

[5460]-162

[Total No. of Pages : 3

T.E.(Electrical)

ELECTRICAL MACHINES - II

(2012 Pattern) (Semester - I) (Endsem.) (303142)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.No.1 or 2, Q.No.3 or 4, Q.No.5 or 6, Q.No.7 or 8, Q.No.9 to 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)** With a neat diagram explain construction of three phase Alternator. **[5]**
- b) A star connected three phase alternator delivers a three phase star connected load at a power factor of 0.8 lagging. The terminal voltage at no load is 2500 v and at a load of 1460 kW is 2200 v. Determine the terminal voltage when it delivers a load having resistance of 6Ω and a reactance of 8Ω per phase. Assume constant current and field excitation. **[5]**

OR

- Q2) a)** With a neat phasor diagram explain pitch factor. **[4]**
- b) Explain the procedure to determine the regulation of three phase alternator by e.m.f. method. **[6]**
- Q3) a)** Compare three phase synchronous motor with three phase induction motor on following point. **[5]**
- i) Starting
 - ii) Speed
 - iii) Power factor
 - iv) Cost/kVA
 - v) Size/KVA
- b) A three phase 3.3 kV, 50 Hz star connected synchronous motor has a synchronous impedance of $(0.3 + j4.9)\Omega$ /phase. Calculate the line current for an induced emf of 4kV and an input power of 900kW at rated voltage. **[5]**

OR

P.T.O.

- Q4)** a) Define regulation of an alternator. Should it have a high or a low value? Justify your answer. [5]
b) Compare salient pole alternator with non-salient pole alternator. [5]

- Q5)** a) With a neat figure explain construction and working of burshless d.c. motor. [8]
b) What are different stator side speed control methods of three phase induction motor? With a neat figure explain any one method. [8]

OR

- Q6)** a) With a neat figure explain construction and working of variable reluctance stepper motor. [8]
b) Draw complete slip-torque characteristics of three phase induction motor and explain working of induction generator. [8]

- Q7)** a) Write step by step procedure to plot circle diagram of a.c. series motor. [8]
b) With a neat diagram explain the working of universal motor with its operating characteristics. [8]

OR

- Q8)** a) Compare uncompensated a.c. series motor with compensated a.c. series motor. [8]
b) With a neat diagram explain conductively compensated series motor & inductively compensated series motor. [8]

- Q9)** a) With neat diagram explain double revolving field theory. Hence draw torque - speed characteristics of single phase induction motor. [8]
b) With a suitable diagram explain no load and blocked rotor test on single phase induction motor. How equivalent parameters are obtained from these tests. [10]

OR

Q10)a) With neat diagram explain construction and working of split phase induction motor. Draw its torque speed characteristics. **[8]**

b) The test results of a 230 volts single phase induction motor are given below: **[10]**

Blocked rotor test: 110v, 9.5A, 450W

No-load test: 230v, 4.4A, 120W

The starting winding is kept open during blocked rotor test and stator winding resistance is 1.4Ω . Find the equivalent circuit parameters, the core and frictional and windage losses.

