Total No. of Questions : 10]

SEAT No. :

P3956

[Total No. of Pages : 3

[5253] - 528
T.E. (Electrical) (End Semester)
ELECTRICAL MACHINES - II
(2015 Pattern)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer Q.No.1 or Q.No.2 & Q.No.3 or Q.No.4 & Q.No.5 or Q.No.6 & Q.No.7 or Q.No.8 & Q.No.9 or Q.No.10.***
2) ***Assume suitable data wherever necessary.***
3) ***Figures to the right in Bold indicate maximum marks.***
4) ***Use of non-programmable scientific calculator is permitted.***
5) ***Neat figures must be drawn wherever necessary.***

Q1) a) Compare salient pole type construction with non-salient pole type construction in case of three phase alternator. **[4]**

b) A three phase star connected, 1000KVA, 11000V alternator has rated current off 52.5A. The armature resistance per phase is 0.45Ω. The test results of the alternator is as given below : **[6]**

O.C. Test-Field Current =14.5A; Voltage between lines is 422V

S.C. Test-Field Current = 14.5A; Line Current = 52.5A.

Determine the full load voltage regulation of alternator at 0.8 power factor lagging.

OR

Q2) a) Define pitch factor. **[2]**

b) With a neat circuit diagram elaborate in detail procedure to determine the regulation of three phase alternator by m.m.f. method. **[8]**

Q3) a) A three phase 16 pole alternator has star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb of distributed winding and field is rotated at speed of 375rpm. Find the frequency of induced emf, phase voltage and line voltage. **[6]**

b) Define short circuit ration of alternator. Elaborate its significance. **[4]**

OR

P.T.O.

Q4) a) What are the necessary conditions of synchronizing two alternators in parallel? **[4]**

b) An alternator has direct axis synchronous reactance of 0.9 per unit and quadrature axis reactance of 0.55 per unit. Find per unit open circuit voltage for full load at lagging power factor of 0.8. **[6]**

Q5) a) With a neat diagram describe the construction and working of superconducting generator; also state its advantages. **[8]**

b) How speed of three phase induction motor varied by V/f method. **[8]**

OR

Q6) a) Draw complete slip-torque characteristics of three phase induction motor and explain working of three phase induction generator. **[8]**

b) With a neat figure describe construction and working of Linear Induction Motor. **[8]**

Q7) a) Describe the procedure to plot circle diagram of single phase uncompensated a.c. series. **[8]**

b) What are the problems experienced by d.c. series motor operated on a.c. supply. Elaborate the remedies for use on a.c. supply. **[8]**

OR

Q8) a) Describe with neat diagram how Universal motor works? Draw its operating characteristics. **[8]**

b) A Universal motor having resistance of 40Ω and inductance of 0.3H connected to 240V d.c. supply and loaded draws a current of 1A at 2000rpm. Find the speed and torque when the motor is connected to 240V, 50Hz a.c. supply and loaded to draw the same value of current when connected with d.c. supply. **[8]**

Q9) a) With neat diagrams explain double field revolving 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. Draw equivalent circuits of motor under two test conditions. **[10]**

OR

Q10)a) With neat diagram explain construction and working of capacitor start capacitor run single phase induction motor. Draw it torque speed characteristics. **[8]**

b) A 220V, single phase induction motor gave the following test results : **[10]**

Blocked Rotor Test - 110V, 10A, 400W

No load Test- 220V, 4A, 100W

The stator winding resistance is 2Ω. Neglecting Ro find the parameters of equivalent circuit. Also find core, frictional and windage losses.

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