

Total No. of Questions : 6]

SEAT No. :

P5029

[Total No. of Pages : 2

TE / Insem - 527
T.E. (Electrical)
ELECTRICAL MACHINES - II
(2012 Pattern)

Time : 1 Hour]

[Max. Marks :30

Instructions to the candidates:

- 1) *Neat diagram must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of electronic pocket calculator is allowed.*
- 4) *Assume suitable data if necessary.*

- Q1)** a) Compare salient pole type construction with non salient pole type, in 3 phase synchronous machines. **[4]**
- b) A 3 phase 4 pole star connected alternator has 60 slots & 2 conductors per slot. The pitch of the coil is 3 slots less than pole pitch. The flux per pole is 125 mwb sinusoidally distributed. Calculate no load terminal voltage for frequency of 50 Hz. **[6]**

OR

- Q2)** a) What is armature reaction in case of three phase alternator. Explain its effect on working as alternator at zero lagging P.F **[4]**
- b) With neat diagram, explain slip test. How X_d and X_q can be calculated? **[6]**
- Q3)** a) Compare emf and muf method of finding voltage regulation of alternator. **[4]**
- b) The test results of 3 phase 1000 kvA, 11 kv, star Connected alternator are as follows: **[6]**

O.C test - field current = 12.5A , Volt between lines =422V

S.C test - field current = 12.5A , line current =52.5Amp.

Determine voltage regulation at 0.8 pf lag

Take $R_a = 0.45\Omega/\text{Phase}$

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OR

- Q4)** a) Explain dark lamp method of synchronization of 3 phase alternators. [4]
- b) A 2 pole 50 Hz 3 phase alternator is excited to generate bus-bar voltage of 11 kv as no load. The machine is star connected & the short circuit current for this excitation is 1000 A. calculate the synchronizing power per degree of mechanical displacement of the rotor & the corresponding synchronizing torque. [6]
- Q5)** a) Explain the operation of synchronous motor at constant excitation & variable load. [4]
- b) A 3 phase star connected 6.6 kv synchronous motor takes 72 Amp. at 0.8 pf leading. the armature resistance & synchronous reactance per phase of the motor are 0.1Ω & 0.9Ω respectively determine the emf induced. [6]

OR

- Q6)** a) Explain any one method of starting three phase synchronous motor. [4]
- b) Explain the phenomenon of hunting in synchronous motor. Explain how it can be reduced. [6]

