

Total No. of Questions : 6]

SEAT No. :

P3686

[Total No. of Pages :2

Engg. - 23
T.E. (Electrical) (Semester - I)
Electrical Machines - II (In Sem.)
(2012 Pattern)

Time :1 Hour]

[Max. Marks :30

Instructions to the candidates :

- 1) *Answer Q.1 or 2, Q.3 or 4, Q.5 or 6.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume Suitable data if necessary*

Q1) a) Compare rotating field type construction and rotating armature type construction.(minimum 8 points) **[4]**

b) A 3phase, star Connected alternator has 8 poles and 96 slots with 10 conductors per slot. The alternator runs at 750 rpm. The flux per pole is 60 mwb. Find the emf induced between line terminals. Determine its KVA rating if current (rated) is 400 Ampere. **[6]**

OR

Q2) a) Explain effect of armature reaction at unity power factor and lagging power factor condition for alternator. Draw respective phasor diagrams.**[4]**

b) Draw phasor diagram for two reaction theory considering different voltage drops at lagging power factor condition. A 3phase, 480 volt, 50Hz salient pole alternator has delta connected stator winding. It supplies a load current of 1200 ampere at 0.8 power factor lagging The direct axis reactance is 0.1Ω and quadrature axis reactance is 0.075Ω Determine emf of the alternator. Neglect armature resistance. **[6]**

Q3) a) Draw zero power factor (ZPF) characteristics and potier triangle for synchronous generator. Explain how voltage regulation is determined from ZPF characteristics data and potier triangle **[4]**

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- b) A 3phase, star connected alternator is rated 2400KVA with line voltage of 13856.4 volt. The armature resistance is 1.5Ω per phase and synchronous reactance is 30Ω per phase, Determine its voltage regulation at 0.866 power factor lagging and 0.866 power factor leading Draw phasor diagram of alternator at unity power factor condition. [6]

OR

- Q4)** a) Explain the effect of change in speed during parallel operation of two alternators and role played by synchronising current. [4]
- b) Explain MMF method for finding voltage regulation of synchronous generator. [6]

- Q5)** a) Explain constant load, variable excitation mode of operation of synchronous motor with suitable phasor diagrams and graphs. [6]
- b) A 3 phase star connected synchronous motor is rated 373kw, 2200 volt with synchronous impedance as $0.3 + j3\Omega$ per phase It draws a current of 130 Amp at certain load condition. The powerfactor is 0.8 leading. Find load angle for this condition. [4]

OR

- Q6)** a) Draw and explain torque angle characteristics of synchronous motor.[4]
- b) Explain role played by damper winding incase of synchronous motor during. [6]
- i) Starting condition
 - ii) Running condition
 - iii) Load changes under running condition

