SEAT No. :

PC-35

[6360]-35

T.E. (Electrical Engineering) (Insem)
ELECTRICAL MACHINES - II
(2019 Pattern) (Semester - I) (303143)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates :

1) *Solve Q1 or Q2, Q3 or Q4.*
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) Why rotating field & stationary armature type of construction is preferred for 3-ph alternator. **[7]**

b) Calculate the no load emf of a star connected 3-ph , 6 pole alternator which is driven at 1200 rpm having flux per pole 0.12 Wb. The armature has 54 slots and double layer winding. Each coil has 10 turns & coil is short chorded by two slots. **[8]**

OR

Q2) a) Draw the circuit diagram & explain the procedure to conduct slip test on salient pole 3-ph alternator to determine voltage regulation. Write the necessary formulae. **[7]**

b) A 3-ph, 1000 kVA 3300 V, 50Hz star connected salient pole generator has $Xd = 1.9$ Ω & $Xq = 1.4$ Ω. Find **[8]**
   i) load angle δ
   ii) voltage regulation at pf 0.8 lagging. Assume arm. Resistance $Ra = 0$

Q3) a) Sketch the OCC and SCC of alternator & write down the steps to determination of voltage regulation of 3-ph alternator at lagging power factor by MMF method analytically. Assume $Ra = 0$. **[7]**

b) A 2000 kVA, 2300V, 3-ph star connected alternator has armature resistance of 0.06 Ω per phase. A field current 60 A, produces armature current of 600A and no load line emf of 900 V. Calculate (i) full load voltage regulation at 0.8 p.f lagging & (ii) power angle δ. **[8]**

OR

P.T.O.

Q4) a) Define & explain the short circuit ratio using OCC & SCC plots. Comment on voltage regulation for (i) for higher value of SCR (ii) lower value of SCR. **[7]**

b) Explain one dark and two equally bright lamp method of synchronizing of 3-ph alternators. Sketch the necessary circuit & phasor diagrams.

[8]

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