Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PPDC - SEMESTER– VI • EXAMINATION – SUMMER 2014

Subject Code: X60901 **Date: 28-05-2014**

Subject Name: ELECTRICAL MACHINE-III

Time:10.30 am TO 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Explain the difference between salient pole & cylindrical pole type construction of alternator & derive the equation for induced E.M.F. **07**

(b) Explain the Hopkinson test to determine the efficiency of D.C.Machine **07**

Q.2 **(a)** List out the various method to find voltage regulation of an alternator & explain potier triangle method **07**

(b) A 10poles , 50Hz,600RPM alternator's flux distribution is given by an equation as follows **07**

B= Sinθ +0.4 Sin3θ+ 0.2 Sin5θ

This alternator has 180 slots with 2-layer winding with 3-turn coil having a span of 15slots, coils are connected in 60^0 group , it has armature diameter =1.2Metre & core length= 0.4Metre, find the expression for instantaneous E.M.F. per coil

OR

(b) Explain Winding factor & chording factor of an alternator **07**

Q.3 **(a)** Explain the test performed on D.C. Series machine to find the efficiency **07**

(b) Explain & draw the vector diagram of an alternator at resistive, lagging & leading power factor **07**

OR

Q.3 **(a)** Explain the Break test on D.C. machine **07**

(b) Explain the test to find separation of losses in D.C. machine **07**

Q.4 **(a)** Explain the Slip test to find Direct axis & quadreature axis reactance & also explain which reactance has larger value & why? **07**

(b) The Open and short circuit test readings for 3-ph star connected,01MVA alternator , 2KV,50Hz are **07**

Field Current	10	20	25	30	40	50
O.C. Ter.Volts:-	800	1500	1760	2000	2350	2600
S.C.Current:-	---	200	250	300	----	-----

The effective resistance of armature is 0.2Ohm per phase, draw characteristic curve & find it's voltage regulation at (1) 0.8 p.f. lagging and (b) 0.8p.f. leading, at full load ,Use Amp-Turn method

OR

Q.4 **(a)** Why synchronous motor is not self-starting? List out various methods to start synchronous motor & explain any one **07**

(b) Explain Auto synchronous Motor **07**

Q.5 **(a)** Explain Mini-stepping & Micro stepping of variable reluctance motor **07**

(b) Explain A.C Servo motor **07**

OR

Q.5 **(a)** Explain Three phase induction regulator **07**

(b) Explain Construction & working principle of PMBLDC motor **07**

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