Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name: Electrical Machine-III

Subject Code:4TE05EMC1 **Branch:** B.Tech (Electrical)

Semester: 5 **Date: 30/03/2017** **Time:02:30 To 05:30** **Marks: 70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

a) If the excitation is critical, the power factor of the alternator is **(1)**
(a) unity power factor
(b) leading power factor
(c) lagging power factor
(d) none of the above

b) When pure inductive load is connected to the alternator, what is the effect of armature reaction? **(1)**
(a) cross magnetization
(b) demagnetization
(c) magnetization
(d) none of the above

c) Reactive power generated or delivered significantly depends on **(1)**
(a) load angle
(b) excitation
(c) both 1 and 2
(d) frequency

d) If direct axis reactance Xd and quadrature axis reactance Xq are equal, then reluctance power is **(1)**
(a) maximum
(b) zero
(c) minimum
(d) all of the above

e) Universal motor have which of the following application? **(1)**
(a) Domestic pump
(b) Food mixer
(c) Traction
(d) Lift.

f) The usual test for determining the efficiency of a traction motor is the ….. test **(1)**

(a) Fields
(b) retardation
(c) Hopkinson's
(d) Swinburne's

g) The main disadvantage of Hopkinson's test for finding efficiency of d.c shunts is that it **(1)**
(a) requires full load power
(b) ignores any change in iron loss
(c) needs one motor and one generator
(d) requires two identical shunt machines

h) Hopkinson's test on D.C. machines is conducted at to determine **(1)**
(a) no-load
(b) part load
(c) full-load
(d) overload

i) What is Synchronous Capacitor? **(1)**

j) Will the synchronous motor start with the field excited? **(1)**
(a) Yes (b) No.

k) What could be the reasons if synchronous motor fails to start? **(1)**

l) What is armature reaction in alternator? **(1)**

m) How can a universal motor be reversed? **(1)**

n) An outstanding feature of a universal motor is its **(1)**
(a) best performance at 50 Hz supply
(b) slow speed at all loads
(c) excellent performance on dc supply
(d) highest output kw/kg ratio

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

a) Briefly discuss the brake test to find efficiency of DC machines. **(7)**

b) Explain field test on two identical dc series machines. **(7)**

Q-3 **Attempt all questions** **(14)**

a) Write short note on Permanent Magnet DC machines. **(7)**

b) Explain armature reaction and its effects at different power factor in Alternator. **(7)**

Q-4 **Attempt all questions** **(14)**

a) Explain the two reaction theory of salient pole machine in detail with phasor diagram. **(7)**

b) The Hopkinson's test on two shunt machines gave the following results for full load Line voltage = 250 V: Current taken from supply system excluding field currents=50A; Motor armature current =380A;Field currents 5A and 4.2 A.Calculate the efficiency of the machine working as a generator. Armature resistance of each machine is 0.2 ohm. **(7)**

Q-5 **Attempt all questions** **(14)**

a) Explain construction & working of Hysteresis motor. **(7)**

	b)	What are the different types of stepper motor? Explain any one in detail.	**(7)**
Q-6		**Attempt all questions**	**(14)**
	a)	Explain constuction and working of switched reluctance motor.	**(7)**
	b)	Write a short note on Permanent Magnet Brush Less DC motor.	**(7)**
Q-7		**Attempt all questions**	**(14)**
	a)	What are the different types of torques in synchronous motor? Explain each of them.	**(7)**
	b)	Explain V and inverted V curve of synchronous motor.	**(7)**
Q-8		**Attempt all questions**	**(14)**
	a)	Explain construction and working of axial flux permanent magnet machines.	**(7)**
	b)	Derive the equation for the load shared by the two synchronous generators.	**(7)**