Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Winter Examination-2019

Subject Name: Electrical Machine – III

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

Semester: 5 **Date: 25/11/2019** **Time: 10:30 To 01:30** **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) In a Synchronous motor, damper winding is provided in order to **(01)**
(a) Stabilize rotor motion
(b) Suppress rotor oscillation
(c) Develop necessary starting torque
(d) Both (b) and (c).

b) Synchronous capacitor is **(01)**
(a) an ordinary static capacitor bank
(b) an overexcited synchronous motor driving mechanical load
(c) an overexcited synchronous motor running without mechanical load
(d) None of above.

c) Universal motor have which of the following application? **(01)**
(a) Domestic pump
(b) Food mixer
(c) Traction
(d) Lift.

d) Armature reaction in an alternator primarily affects **(01)**
(a) Rotor speed
(b) Terminal voltage per phase
(c) Frequency of armature current
(d) Generated voltage per phase.

e) One of the main advantage of Swinburne's test is that **(01)**
(a) Is applicable both to shunt and compound motors
(b) Needs one running test
(c) Is very economical and convenient
(d) Ignores any charge in iron losses.

f) The usual test for determining the efficiency of a traction motor is the ….. test **(01)**
(a) Fields
(b) retardation
(c) Hopkinson's
(d) Swinburne's.

g) Which of the following tests can be conducted on other than shunt machines? **(01)**
(a) Retardation
(b) Hopkinson's
(c) Fields
(d) Swinburne's.

h) Which has more efficiency; Synchronous motor or induction motor? **(01)**

i) Why the testing is taken in any machine? **(01)**

j) Write application of synchronous motor. **(01)**

k) What is armature reaction in alternator? **(01)**

l) Define: Hunting. **(01)**

m) How can a universal motor be reversed? **(01)**

n) Does change in excitation affect the synchronous motor speed? **(01)**

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. **(07)**

(b) Explain field test on two identical dc series machines. **(07)**

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

(a) Derive the equation of MMF of distributed winding for a synchronous machine. **(07)**

(b) Explain Hopkinson's test for determination of efficiency of DC shunt Machine. **(07)**

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

(a) Briefly describe the short circuit ratio and its significance. **(07)**

(b) Explain the two reaction theory of salient pole machine in detail with Phasor diagram. **(07)**

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

(a) Explain Hunting prevention in synchronous machine. **(07)**

(b) Explain construction & working of Hysteresis motor. **(07)**

Q-6 **Attempt all questions** **(14)**

(a) A 200 Shunt motor develops an output of 17.158 KW when taking 20.2 KW. The field resistance is 50 ohm and armature resistance 0.06 ohm. What is the efficiency and power input when the output is 7.46 KW? **(07)**

(b) What are the different types of torques in synchronous motor? Explain Each of them. **(07)**

Q-7 **Attempt all questions** **(14)**

(a) Explain with reason why starting torque of a synchronous motor is zero? Describe any two methods of starting of a synchronous motor. **(07)**

(b) Explain construction and working of variable reluctance stepper motor. **(07)**

Q-8 **Attempt all questions** **(14)**

(a) Write a short note on Permanent Magnet Brush Less DC motor. **(07)**

(b) Explain V and inverted V curve of synchronous motor. **(07)**

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