Sub Code:EEE501

Paper Id: 120511 Roll No:

B.TECH

(SEM-V) THEORY EXAMINATION 2019-20

ELECTROMECHANICAL ENERGY CONVERSION-II

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt all questions in brief.** **2 x 10 = 20**

a. Give application area of the cylindrical and salient pole type synchronous machine.
b. What is a distributed winding and distributed factor?
c. What do you mean by torque in synchronous watt?
d. What is meant by hunting of synchronous motor?
e. Explain how the rotor resistance starting of slip ring induction motor reduces starting current and increase starting torque.
f. Why the induction motor can't run at synchronous speed?
g. What do you understand by induction generator?
h. How will you reverse the direction of rotation of the single phase induction motor?
i. Give some application of stepper motor.
j. What is the role of compensating winding in universal motor?

SECTION B

2. **Attempt any three of the following:** **10x3=30**

a. A salient-pole synchronous motor has
Xd=0.85 p.u. and Xq = 0.55 p.u.
It is connected to bus-bars of 1.0 p.u. voltage, while its excitation is adjusted to 1.2 p.u. Calculate the maximum power output, the motor can supply without loss of synchronism.
Compute the minimum p.u. excitation that is necessary for the machine to stray in synchronism while supplying the full-load torque (i.e 1.0 p.u. power).
b. Derive the expression for synchronizing power and torque for 3 phase synchronous machine.
c. Derive the relation for torque developed in 3 phase induction motor, also derive the condition for maximum torque.
d. Discuss the phenomenon of crawling and cogging in three phase induction motor.
e. Explain double field revolving theory.

SECTION C

3. **Attempt any one part of the following:** **10x1=10**

a. Explain clearly the ZPF method of determining the regulation of alternator.
b. Explain the MMF method of determining the regulation of alternator.

4. **Attempt any one part of the following:** **10x1=10**

a. Derive an expression for finding regulation of salient pole synchronous alternator using two reaction theory Draw its phasor diagram.
b. Explain hunting and damping in synchronous motor.

5. **Attempt any one part of the following:** **10x1=10**

a. Draw and explain equivalent circuit and phasor diagram of three phase induction motor.
b. Explain block rotor test on a 3 phase induction motor also explain why this test is performed.

6. **Attempt any one part of the following:** **10x1=10**

a. Explain deep bar and double cage rotor.
b. Explain any two starting method of three phase induction motor.

7. **Attempt any one part of the following:** **10x1=10**

a. Explain no load and blocked rotor test of single phase induction motor.
b. Explain universal motor. Also give its applications.