

- b. Explain the working principal of split phase and capacitor-start single phase induction motor with the torque-slip characteristics and the applications.
- c. Explain the operation of a stepper motor and state some application.

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(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 121503

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B. Tech.

(SEM. V) SPECIAL CARRY OVER EXAMINATION 2014-15

**ELECTROMECHANICAL ENERGY CONVERSION-II**

*Time : 3 Hours]*

*[Total Marks : 100*

**Note:** (i) Attempt all questions.

(ii) All questions carry equal marks.

1. Attempt any four of the followings. **(5X4=20)**

- a. Explain Potier's-triangle method of determining regulation of an alternator.
- b. In a 4 pole, 3 phase alternator, armature has 36 slots. It is using an armature winding which is short pitched by one slot. Calculate its coil span factor.

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- c. List the advantages of stationary armature in synchronous machine.
- d. Sketch and explain the open circuit and short circuit characteristics of a Synchronous machine.
- e. Explain e.m.f. equation of alternator.
- f. What is synchroscope? How is it used for synchronization of alternator?

2. Attempt **any four** of the followings. **(5X4=20)**

- a. Describe the principle of rotating magnetic field in a 3-phase induction motor.
- b. Derive the torque equation for 3-phase induction motor.
- c. A 4 pole, 3-phase, 50 Hz, star connected induction motor has a full load slip of 4%. Calculate full load slip speed of the motor.
- d. Develop the equivalent circuit for a 3-phase induction motor.
- e. Explain Torque-slip characteristics of a 3-phase induction motor.
- f. Explain induction generator and its application.

3. Attempt **any two** of the followings **(10X2=20)**

- a. State the starting method of synchronous motor. Explain any one in detail.
- b. What are the causes of "HUNTING" in synchronous m/c s explain it? How is it minimized?
- c. Explain the two reaction theory of silent-pole synchronous m/c.

4. Attempt **any two** of the followings. **(10X2=20)**

- a. Why starter necessity in 3-phase induction motor? Explain the working of direct on line starter with the help of diagram.
- b. What is the purpose of using deep-bar cage rotors? Explain the construction and working of a double cage motor.
- c. Discuss the phenomenon of cogging and crawling in a 3-phase induction motor.

5. Attempt **any two** of the followings. **(10X2=20)**

- a. Why the 1-phase induction motor is not self-starting? Explain "double revolving field theory".