Roll No. .....

3096

B. Tech. 4th Semester (EE) Examination – July, 2021

ELECTRICAL MACHINES-II

Paper : PCC-EE-206-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is ***compulsory***. Attempt ***four*** more questions by selecting ***one*** question from each Section.

1. (a) Mention the undesirable effects produced by certain combination of rotor and stator slots.

(b) What is synchronizing power in alternators ?

(c) What is the role of damper winding in synchronous motor ?

(d) Why wound rotor construction is adopted ?

(e) Define cogging.

(f) Why synchronous motor is not self-starting ?

$2.5 \times 6 = 15$

SECTION – A

2. (a) Describe mathematically development of rotating magnetic field in 3- phase induction motor. 10

   (b) State difference between squirrel cage and slip ring induction motor. 5

3. Draw and explain the equivalent circuit of 3-phase induction motor. 15

SECTION – B

4. Why single phase induction motor is not self-starting while three-phase IM is self-starting ? Describe starting methods used for single- phase IM. 15

5. What are the various methods of speed control of IM ? Explain Slip power recovery speed control method of IM. Mention advantages and disadvantages of rotor resistance method. 15

SECTION – C

6. Define voltage regulation of an alternator. Describe Potier method of determining regulation of an alternator. 15

7. (a) A 4-pole, 50 Hz, star connected alternator has 15 slots per pole and each slot has 10 conductors. All the conductors of each phase are connected in

series and the winding factor being 0.95. When running on no-load for a certain flux-per-pole, the terminal e.m.f. was 1825 volt. If the winding are lap-connected as in d.c. machine, what would be the e.m.f. between the brushes for the same speed and the same flux/pole ? Assume sinusoidal distribution of flux. 10

(b) Define pitch factor and distribution factor. 5

SECTION – D

8. What are the conditions that must be satisfied for parallel operation of Alternators ? Derive voltage and current equations for parallel operation of 2 alternators. 15

9. Write short note on : 15

(a) Damper winding.

(b) Synchronous condenser.

(c) Applications of synchronous motor.