Roll No. ....

OLE-24225

B. Tech. 5th Semester (EE)
Examination – April, 2021

ELECTRICAL MACHINES - II

Paper : EE-311-F

Time : Three Hours]   *[Maximum Marks : 100*

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 : Attempt *five* questions in all, selecting at least *one* question from each Section. Question No. **1** is *compulsory*.

1. (a) Why a single-phase induction motor is not self-starting ?   4

    (b) What do you mean by the term cogging and crawling ?   4

    (c) Discuss the basic concept of self excited induction generator.   4

    (d) What do you mean by term transient and sub-transient reactances in synchronous generator ?   4

(e) What do you mean by winding factor in an electrical machine ? 4

SECTION – A

2. Derive an expression for development of rotating magnetic field in three phase induction motor. 20

3. Discuss various methods of speed control of 3-phase induction motor. 20

SECTION – B

4. Describe different types of I-phase induction motor. 20

5. A 2-pole, 240V, 50Hz. single-phase induction motor has the following constants referred to stator : $R_1 = 2.2\Omega$. $X_1 = 3.0\Omega$, $R'_2 = 3.8\,\Omega$. $X'_2 = 2.1\,\Omega$; $X_m = 86\,\Omega$.

Find the stator current and input power when the motor is operating at a full load speed of 2820 r.p.m. 20

SECTION – C

6. What is the need for parallel operation of an alternator ? Also discuss briefly methods of synchronization. 20

7. (a) Discuss output power equation of a synchronous generator. 10

(b) Explain the synchronous reactance method of voltage regulation for a synchronous generator. 10

SECTION – D

8. (a) Explain the working principle of a synchronous motor. **10**

(b) Discuss the role of damper winding in synchronous motor. **10**

9. Write short note on synchronous motor : **20**

(a) power-angle curve

(b) v-curve

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