TED (10) 4042
(Revision-2010)

A21 ´ P0367A

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2021

SYNCHRONOUS MACHINES AND FHP MOTORS

[Maximum marks: 100] (Time: 3 Hours)

PART ¯ A

[Maximum marks: 10]

(Answer all questions in one or two sentences. Each question carries 2 marks)

I. (1). Write the classification of alternators on the basis of rotors.

(2). Write down the purpose of using damper winding.

(3). Write the methods to find the regulation of alternators.

(4). Name two types of stepper motor.

(5). What do you mean by step angle of a stepper motor. (5 x 2 = 10)

PART ¯ B

[Maximum marks: 30]

(Answer any five of the following questions. Each question carries 6 marks)

II. (1). Explain the advantages of stationary armature over rotating armature.

(2). Derive the equation for distribution factor of an alternator.

(3). Write down the conditions for Synchronisation of alternators.

(4). Explain the cooling methods of alternators.

(5). Explain the principle of operation of synchronous motor.

(6). Discuss the working of variable reluctance stepper motor.

(7). Explain the construction and working of permanent magnet stepper motor. (5 x 6= 30)

PART ¯ C

[Maximum marks: 60]

(Answer one full question from each unit. Each question carries 15 marks)

UNIT ¯I

III. (a). Explain the constructional details of different types of rotors in alternators with the help of neat sketches. (8)

(b). Derive an expression for induced e.m.f in an alternator. (7)

OR

IV. (a). Explain the construction and working of an alternator. (7)

(b). What is the effect of harmonics in the emf induced in the alternator. (8)

UNIT-II

V. (a). Explain the methods to find voltage regulation by EMF method. (7)

(b). Explain the dark lamp method of synchronization of two three phase alternators with the help of connection diagram. (8)

OR

VI. (a). Draw the vector diagram of alternator on load under different power factor. (7)

(b). Determine the voltage regulation of a 1000V, 1– alternator delivering a current of 50A at (i) UPF, (ii) 0.8 leading pf and (iii) 0.71 lagging pf. Full load current of 50A is produced on short circuit by a field excitation of 2.5A, an emf of 500V is produced on open circuit by the same excitation. The armature resistance is 0.8'n. (8)

UNIT-III

VII. (a). Discuss different methods for preventing hunting. (8)

(b). Compare synchronous motor with an induction motor. (7)

OR

VIII. (a). What will happen if the load on the synchronous motor is varied ? How to minimize the effect of momentary load fluctuations? (7)

(b). Illustrate the working of synchronous condenser. (8)

UNIT-IV

IX. (a). Explain with neat sketch the working of capacitor start induction run motor. (7)

(b). Discuss the working principle of ac servo motor (8)

OR

X. (a). Explain the construction and working of a shaded pole motor. (7)

(b).Write a short note on two value capacitor ¯ run motor with the help of a diagram (8)

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