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Sixth Semester B.Tech. Degree Examination, June/July 2023 Motor, Drives and Power Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is electric drive, state the essential parts of electric drive. (10 Marks)
- b. Derive the expression for equivalent moment of inertia torque component refer to motor shaft for following:
 - i) Load with rotational system
 - ii) Load with translation system. (10 Marks)

OR

- 2 a. Explain the rheostatic braking for a DC series motor. (10 Marks)
- b. Explain with speed time curve of regenerative braking with
 - i) 3 phase induction motors
 - ii) D.C. Motors. (10 Marks)

Module-2

- 3 a. Explain any 4 methods of turn on used for thyristor. (10 Marks)
- b. Derive an expression for anode current using two transistor model of thyristor. (10 Marks)

OR

- 4 a. Explain the switching characteristic of MOSFET. (10 Marks)
- b. With neat circuit diagram explain
 - i) RC half wave firing circuit
 - ii) RC full wave firing circuit. (10 Marks)

Module-3

- 5 a. With a neat diagram, explain the half wave AC/DC conversion for resistance load. (10 Marks)
- b. With neat circuit diagram explain the / phase transistorized Current Source Inverter (CSI). (10 Marks)

OR

- 6 a. With neat circuit diagram explain the half wave controlled rectifier with free wheeling diode. (10 Marks)
- b. Explain any 2 types of Pulse Width Modulation (PWM) techniques. (10 Marks)

Module-4

- 7 a. Explain the speed torque characteristics of DC series motor. (08 Marks)
- b. Write equivalent circuit of 3 phase induction motor, develop an expression for torque developed. Discuss the N-T (speed-torque) characteristics of induction motor. (12 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Explain with neat circuit diagram.
i) Star delta starter
ii) Auto transformer starter. (10 Marks)
b. Write a note on damage of electric machine / motor. (10 Marks)

Module-5

- 9 a. With a neat diagram, explain the concept of speed control of a DC series motor referring to
i) Rheostatic control
ii) Series parallel control. (10 Marks)
b. With a neat diagram, explain static scherbius drive. (10 Marks)

OR

- 10 a. Explain the concept of speed control of Induction motor by
i) Variation of supply frequency
ii) Variation of supply voltage. (10 Marks)
b. Explain the static rotor resistance control of induction motor. (10 Marks)

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