



CBCS SCHEME

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21MT42

Fourth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Electrical Drives and Control (IPCC)

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? (05 Marks)
b. Draw and explain basic block diagram of electric drives. (10 Marks)
c. List out the advantages of an electrical drives. (05 Marks)

OR

- 2 a. Draw the typical temperature rise-time curve and derive the equation for temperature rise in an electric drive. (10 Marks)
b. A motor drives two loads. One has rotational motion. It is coupled to the motor through a reduction gear with a = 0.2 and efficiency of 95%. The load has moment of inertia of 5kg m^2 and load torque of 20N-m. The other load has translational motion and has a weight of 500kg which has to be lifted at a constant speed of 1m/sec. The coupling between the translational load and the motor has an efficiency of 90%. The motor inertia can be taken as 0.5kg m^2 and the motor runs at a speed of 960rpm. Calculate the equivalent inertia referred to the motor shaft. (10 Marks)

Module-2

- 3 a. Explain electrical and mechanical characteristics of DC series motor. (10 Marks)
b. Derive the torque equation of a D.C. motor. (10 Marks)

OR

- 4 a. Draw and explain speed torque characteristics of an induction motor. (10 Marks)
b. Derive the torque equation for a three phase induction motor. (10 Marks)

Module-3

- 5 a. What is the necessity of a starter for a D.C. motor? (05 Marks)
b. Explain, with a neat sketch, the working of a 3 point D.C. shunt motor starter, bringing out the protective features incorporated in it. (15 Marks)

OR

- 6 a. Is a single-phase induction motor is self-starting? Why? (05 Marks)
b. Explain the necessity of starter for three phase induction motor. Explain star delta starter with neat sketch. (15 Marks)

Module-4

- 7 a. What is controlled rectifier? Explain. (05 Marks)
b. How is the speed control of the dc drive achieved using fully controlled rectifier? (15 Marks)

OR

- 8 Explain in detail the Ward Leonard system for the speed control of DC motors and state the advantages and disadvantages of the system. (20 Marks)

Module-5

- 9 What do you mean by slip power recovery? Explain any method of slip power recovery scheme. (20 Marks)

OR

- 10 What is Kramer drive? Explain Kramer drive in detail. (20 Marks)

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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.