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Question Paper Code: 2033053

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Third Semester
Chemical Engineering
U20CH305 – ELECTRICAL MACHINES AND DRIVES
(Regulation 2020)

Time: Three Hours Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. List the factors involved in the voltage buildup of a DC Shunt Generator.
2. Infer the reason for rating of transformer in KVA.
3. Why an induction motor will never run at its synchronous speed?
4. Predict the type of motor that is used for ceiling fan.
5. Show the basic block diagram of an electrical drive.
6. Indicate the different types of braking employed for induction motor.
7. Define strain Guage and mention its types.
8. Indicate the electrical phenomena used in transducers.
9. Identify the key features of ARM mbed OS.
10. Give some of the applications of ARM Mbed nxp ipc1768.

PART – B (5 x16 = 80 Marks)

11. (a) (i) Examine the construction of DC machine with neat sketch. (8)

(ii) Find the equation for the torque developed by a DC motor. (8)

(OR)

(b) (i) Analyse the armature voltage and field flux control methods for the speed control of a DC Motor. (8)

(ii) Develop the EMF equation of a transformer. (8)

12. (a) Outline the features and principle of operation of three-phase synchronous motor. (16)

(OR)

(b) Investigate the Torque Slip characteristics of three phase cage and slip-ring induction motors. (16)

13. (a) (i) Assess the typical load torque characteristics of electrical drive. (8)

(ii) Explain in detail about semi-converter fed separately excited DC motor drives. (8)

(OR)

(b) (i) Apply the V/f control scheme in induction motor and explain in detail. (8)

(ii) Summarize the factors to be considered in selection of drives for paper mills. (8)

14. (a) (i) Illustrate the operation of linear variable differential transformer for the measurement of displacement. (8)

(ii) Outline the operation of piezo electric transducer in detail. (8)

(OR)

(b) (i) Explain the construction and working of thermistors. (8)

(ii) Examine how to measure pressure using capacitive type transducer. (8)

15. (a) Explain the ARM Mbed platform and the architecture of NXP LPC1768 microcontroller. (16)

(OR)

(b) Interpret the process of interfacing a stepper motor with LPC1768 using the Mbed framework. (16)

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