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Fifth Semester B.Tech. Degree Examination, Jan./Feb. 2023

Mechatronics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain in detail the design process of mechatronics system. (10 Marks)
b. Briefly explain the elements of closed loop control system with block diagram. (10 Marks)

OR

- 2 a. Explain the parameters which affect the performance of transducers. (10 Marks)
b. Explain : (i) Pneumatic sensors (ii) Proximity switches. (10 Marks)

Module-2

- 3 a. Explain spool valve and poppet valve with neat sketch. (10 Marks)
b. Discuss Rotary actuators with sketch. (10 Marks)

OR

- 4 a. Explain four bar chain mechanism with neat sketch. (10 Marks)
b. Discuss simple and compound Gear trains with sketch and equations. (10 Marks)

Module-3

- 5 a. Explain Brush type DC motor with neat sketch. (10 Marks)
b. List and explain stepper motor specifications. (10 Marks)

OR

- 6 a. Briefly explain the interfacing solenoids with block diagram. (10 Marks)
b. Discuss photo reflector sensors with neat sketch. (10 Marks)

Module-4

- 7 a. Explain ARM based embedded device with neat sketch. (10 Marks)
b. Discuss ARM bus technology and AMBA Bus protocol. (10 Marks)

OR

- 8 a. Discuss ARM core data flow model with block diagram. (10 Marks)
b. Explain ARM7 three stage pipeline and instruction sequence with neat sketch. (10 Marks)

Module-5

- 9 a. Discuss Barrel shifter and ALU with neat sketch. (10 Marks)
b. Discuss single register transfer with example. (10 Marks)

OR

- 10 a. Discuss software interrupt instruction with example. (10 Marks)
b. Discuss LDR instruction loading a 32-bit constant. (10 Marks)