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	5E1718	
	B.Tech. V-Sem. (Main/Back) Examination, December - 2025	
	Automobile Engg. 5AE3-01 Mechatronic Systems AE, ME	

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory

(10×2=20)

1. List any five types sensors with example.
2. Give the name of four actuators.
3. Why brushes are not used in BLDC?
4. What do you mean by parking system.
5. Define Kirchhoff's law.
6. Give four differences between microprocessor and microcontroller.
7. How do mechatronics system contribute to automation in manufacturing.
8. What are the different types of system modeling.
9. List five advantages of pneumatic system over hydraulic system.
10. What is the use of PLC in mechatronics.

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions.

(5×4=20)

1. What is actuator, explain it with applications.
2. With help of suitable example explain the working and construction of BJT.
3. A motor has a torque constant of 100Nm/A and voltage constant of 12V per kilo revolution/mm. The armature resistance is 2Ω. If 24V voltage is applied to the terminal, what would be,
 - a) The torque at rotor
 - b) Torque at 100rpm Plot the result as a speed versus torque graph.
4. Name and explain two examples of sequential control system.
5. Explain application on real time industrial automation system using PLC.
6. Why there is need of modeling.
7. Define data acquisition system in mechatronics.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Three questions.

(3×10=30)

1. Write the case study with proper example of car engine management system.
 2. Discuss the fault analysis in mechatronics system.
 3. With the suitable example explain the automatic parking system.
 4. Write short note on
 - a) BLDC
 - b) Signal condition
 - c) PID controller
 5. What are the operations used in control system. Also explain the control system for mechatronic applications.
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