

M.E. Second Semester (Mechanical Engineering) (Thermal Engineering)) (New-CGS)
13524 : Elective-II : Mechatronics : 2 MTE 5

P. Pages : 2

Time : Three Hours



AU - 3376

Max. Marks : 80

- Notes :
1. Answer **any three** question from Section A and **any three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.

SECTION - A

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|----|----|---|---|
| 1. | a) | Differentiate clearly between sensors & transducers. List and describe the parameters those are usually required to be measured in a mechatronics system. | 7 |
| | b) | List and describe briefly the parameters usually required to be measured to define the performance of mechatronics system. | 6 |
| 2. | a) | What are the different controllers used in mechatronics system? Explain functions of programmable logic controller. | 6 |
| | b) | Classify various motors used in mechatronics systems. List and justify the applications of each type. | 7 |
| 3. | a) | Explain direct digital control and supervisory control in case of computer interfaced machines. | 7 |
| | b) | Sketch a typical hydraulic actuator system. What are its typical applications? State its advantages and drawbacks. | 6 |
| 4. | a) | What is the purpose of diagnostics in CNC machines? How is it achieved? | 7 |
| | b) | What are the different methods of implementing computer process control? Explain Direct Digital Control. | 7 |
| 5. | a) | Explain with neat sketch various feeding mechanisms used with automatic machines. | 7 |
| | b) | Explain the need of orientation mechanism. Explain any one of it. | 7 |

SECTION - B

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|----|----|---|---|
| 6. | a) | State the applications where pneumatic and hydraulic systems should be used. Compare and comment. | 7 |
| | b) | Draw the filter regulator and lubricator circuit with symbols and explain it. | 6 |
| 7. | a) | Describe the different directional control valves with neat sketch. | 6 |

- b) Sketch and explain a pneumatic circuit for speed control of a double acting cylinder using flow control valve. 7
- 8. a) Why the synchronization of the piston is required in hydraulic system. Design and draw the circuit for it. 7
- b) Classify various types of pumps in hydraulic system. Explain any one of them using suitable example. 6
- 9. a) Draw and explain directly and pilot operated pressure relief valve with the help of a hydraulic circuit. 7
- b) Design a pneumatic system for sensing two piston movements for material handling application. 7
- 10. a) Design a hydraulic circuit to move an object A, from position 1 to 2 at nearly constant speed. Explain the role of each component. 7
- b) What do you mean by sequence control? By what different methods sequencing can be done in hydraulic circuits? Explain any one sequencing circuit. 7
