

IV B.Tech I Semester Regular Examinations, November 2005
MOTION CONTROL DESIGN
(Mechatronics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Define automation. [4]
(b) Describe various types of automation. [8]
(c) Write the advantages of automation. [4]
2. (a) Explain the operation of a sorting device used in motion control. [8]
(b) Explain the working of a conveyor system. [8]
3. (a) Draw the symbols for
 i. Electric motor
 ii. Pressure gauge
 iii. Non-return valve
 iv. Pressure relief valve. [8]
(b) Describe pilot controlled pressure relief valve with a neat sketch. [8]
4. (a) Describe various types of filters used in hydraulic systems. [8]
(b) Describe a piston pump used in hydraulic system with a neat sketch. [8]
5. Describe any three types of air compressors used in pneumatic system. [16]
6. (a) write the characteristics, Limitations and applications of hydraulic actuators and mechanical actuators. [8]
(b) Differentiate mechanical actuators from electrical actuators. [8]
7. Explain the fuzzy logic system to control and operate an electric motor to run at 1500 RPM. [16]
8. (a) Write the applications of analogue and digital computers for control of mechanical equipment. [8]
(b) Describe the features of programmable logic controllers in comparison to Computers. [8]

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1. (a) Define automation. [4]
(b) Describe various types of automation. [8]
(c) Write the advantages of automation. [4]
2. Write a short notes on:
(a) Indexing mechanisms. [8]
(b) Sorting devices. [8]
3. (a) Write the advantages of hydraulic systems. [8]
(b) Describe pilot operated sequence valve with a neat sketch. [8]
4. (a) Enumerate the differences between centrifugal pump and reciprocating pump. [8]
(b) Describe gerotor pump with a neat sketch. [8]
5. Write short notes on:
(a) Fluidics [6]
(b) Air line Installation [5]
(c) Lubricator [5]
6. (a) write the characteristics, Limitations and applications of hydraulic actuators and mechanical actuators. [8]
(b) Differentiate mechanical actuators from electrical actuators. [8]
7. (a) Discuss the difference between feedback and feed forward control systems. [8]
(b) Explain the basic concept of fuzzy logic system in motion control. [8]
8. (a) Distinguish the operation of microprocessor and a programmable logic controller. [8]
(b) Draw the block diagram of PLC and describe its working. [8]

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1. (a) Define automation. [4]
(b) Describe various types of automation. [8]
(c) Write the advantages of automation. [4]
2. (a) Explain the operation of a sorting device used in motion control. [8]
(b) Explain the working of a conveyor system. [8]
3. (a) Listout the merits of fluid power in manufacturing. [8]
(b) Explain the various characteristics of hydraulic fluid. [8]
4. Draw a circuit diagram to control and operate hydraulic acting cylinder using 4/3 Direction control valve (solenoid control) and explain the principle of working of the Components of the system. [16]
5. Describe the following valves used in pneumatic system.
 - (a) 3/2 Spool type valve [5]
 - (b) Shuttle valve [5]
 - (c) Twin pressure valve. [6]
6. Write short notes on:
 - (a) Mechanical actuators [8]
 - (b) Motion Control aspects in design. [8]
7. (a) Discuss the difference between feedback and feed forward control systems. [8]
(b) Explain the basic concept of fuzzy logic system in motion control. [8]
8. (a) Write the applications of analogue and digital computers for control of mechanical equipment. [8]
(b) Describe the features of programmable logic controllers in comparison to Computers. [8]

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1. (a) Define automation. [4]
(b) Describe various types of automation. [8]
(c) Write the advantages of automation. [4]
2. Write short notes on:
(a) Magazines [8]
(b) Vibratory feeder. [8]
3. Write short notes on:
(a) Pressure control valves [8]
(b) Non return valve. [8]
4. Draw a circuit diagram to control and operate hydraulic acting cylinder using 4/2 Direction control valve (manual type) and explain the principle of working of the Components of the system. [16]
5. (a) Draw the Symbolic representation of the following Pneumatic elements. [8]
 - i. FRL Unit
 - ii. Unidirectional Air compressor
 - iii. Vacuum Pump
 - iv. Pneumatic Motor
(b) Describe the Reciprocating Compressor with a Neat Sketch. [8]
6. (a) Describe any three types of electrical actuators with a neat sketch. [8]
(b) Write the advantages of hydraulic motors over electric motors. [8]
7. Write short notes on:
(a) Closed loop control systems [8]
(b) Adoptive control system. [8]
8. Describe the basic components of programmable logic controllers. [16]
