

SET- 1

Code No: 2420303

IV B. Tech II Semester Regular Examinations, April/May 2009

AUTOMATION IN MANUFACTURING

(Mechanical Engineering)

Time: 3 Hours

Max. Marks 80

Answer any FIVE questions

All questions carry equal marks

1. a) Define 'Fixed Automation' and 'Flexible Automation'. Enumerate the differences between them.
b) What are the important mechanical feeding devices used in automated systems? Discuss them briefly.
2. Draw the neat sketches of the following mechanisms and discuss briefly:
 - a) Ratchet and Pawl mechanism
 - b) 'Over and Under' type chain drive mechanism
 - c) Cam mechanism
 - d) Walking Beam mechanism.
3. a) Discuss the important general terminology used in the analysis of the automated flow lines.
b) What are the two basic approaches used in the analysis of transfer lines without storage? Explain them briefly.
4. a) Briefly discuss the following assembly processes:
 - (i) Adhesive bonding (ii) Joining Methods
b) With the help of suitable example explain the procedure to solve the line balancing problem by Kilbridge and Wester's Method.
5. a) When are the Conveyors used in Automated Material Handling System? What are the different types of conveyor systems?
b) Discuss them briefly with the help of simple sketches, wherever possible.
6. a) Discuss the advantages of using Automated storage systems in a warehouse.
b) What are the various problems encountered in interfacing handling and storage systems with manufacturing units? Discuss them briefly.
7. a) Explain the advantages of using adaptive control systems in turning operation.
b) Enumerate the differences between ACO and ACC types of adaptive control.
8. a) Discuss the applications of Rapid Prototyping.
b) Discuss the reasons for implementation of Business Process Reengineering concepts in various companies

SET- 2

Code No: 2420303

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AUTOMATION IN MANUFACTURING

(Mechanical Engineering)

Time: 3 Hours

Max. Marks 80

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the following types of automation:
(i) Fixed Automation (ii) Flexible Automation.
b) Describe the function and working of the following automated machine tools:
(i) Transfer Machine (ii) Single Station Machine.
2. a) With the help of neat sketches, explain the following linear transfer mechanisms:
(i) Walking Beam Transfer System (ii) Chain Drive Conveyor System
b) Enumerate the differences between synchronous and asynchronous transfer mechanisms.
3. a) What is 'partial automation' and what are the reasons for the existence of partially automated production lines in the shop floors?
b) Discuss the following terms used in the automated flow lines:
(i) Starving of stations (ii) Blocking of stations.
4. a) Explain the different ways in which the work is moved on the line between operator workstations in Manual Assembly Line.
b) What is Flexible Assembly Line? Discuss its important features.
5. What are the different types of material handling equipment associated with the different plant layouts? Discuss them briefly.
6. a) Explain the various applications of AS/RS technology.
b) Describe the use of the following components of an AS/RS:
(i) Pickup and deposit stations (ii) Storage structure
7. a) Explain the advantages of using adaptive control systems in turning operation.
b) What is adaptive control? Under what conditions adaptive control is recommended?
8. a) Explain the solid based Rapid Prototyping process with the help of neat sketch.
b) Explain the objectives of Concurrent Engineering.

SET- 3

Code No: 2420303

IV B. Tech II Semester Regular Examinations, April/May 2009

AUTOMATION IN MANUFACTURING

(Mechanical Engineering)

Time: 3 Hours

Max. Marks 80

Answer any FIVE questions
All questions carry equal marks

1. a) Explain the following types of Automation:
(i) Programmable Automation (ii) Fixed Automation
b) What are the important pneumatic components used in automated system?
Describe briefly.
2. a) With the help of neat sketches, explain the following linear transfer mechanisms:
i) Powered Roller Conveyor System
ii) Walking Beam Transfer System
b) Explain the advantages and limitations of synchronous transfer mechanisms.
3. a) Explain how the efficiency of the flow line increases by adding one or more parts storage buffers between work stations along the line.
b) Discuss the analysis of a two-stage automated flow line.
4. a) What is ranked positional weight value? Explain its importance in solving line balancing problems by using Ranked Positional Weights Method.
b) Discuss any four methods that should be considered by the designer of a flow line for improving the efficiency of the assembly line.
5. a) Explain the advantages of implementing various principles of material handling.
b) Describe the following conveyors used in material transport systems:
(i) In-floor tow-line conveyor (ii) Overhead trolley conveyor.
6. Define AS/RS. Describe the various basic components of AS/RS.
7. a) Explain the advantages of using adaptive control systems in turning operation.
b) Enumerate the differences between ACO and ACC types of adaptive control.
8. a) What are the advantages of various Rapid Prototyping techniques?
b) Briefly explain the software configuration of Business Process Reengineering.

SET- 4

Code No: 2420303

IV B. Tech II Semester Regular Examinations, April/May 2009

AUTOMATION IN MANUFACTURING

(Mechanical Engineering)

Time: 3 Hours

Max. Marks 80

Answer any FIVE questions
All questions carry equal marks

1. a) Draw the simple block diagram of pneumatic circuit and discuss it briefly.
b) What are the different types automation? Discuss them briefly.
2. a) Discuss the general methods of transporting work pieces on flow lines.
b) Discuss the advantages and limitations of the continuous transfer mechanisms.
3. a) Discuss the general terminology used in the analysis of an automated flow line.
b) Discuss briefly about the following terms used in automated flow lines:
(i) Buffer stock effectiveness (ii) Partial Automation
4. a) What are the various assembly systems used in industry to accomplish the assembly processes.
b) Explain the steps used in solving the line balancing problem by using Largest-Candidate Rule method.
5. a) Explain briefly the important principles of material handling.
b) Describe the following conveyors used in material transport systems:
(i) Roller and Skate wheel conveyors (ii) Belt conveyors.
6. a) Explain the various objectives for installing an automated storage system in a factory.
b) Explain the various applications of carousal storage systems.
7. a) Explain the advantages of using adaptive control systems in turning operation.
b) Discuss the comparisons between adaptive machining and non-adaptive machining.
8. a) What is stereo lithography? Describe the stereo lithography with the help of neat sketch.
b) What is Concurrent Engineering and what are its important components?