Code: R7420307

R7

B.Tech IV Year II Semester (R07) Supplementary Examinations March/April 2013

AUTOMATION IN MANUFACTURING
(Mechanical Engineering)

Time: 3 hours   Max Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1 (a) Discuss the following automation strategies that can be employed to improve productivity in manufacturing operations:
        (i) Specialization of operations.   (ii) Increased flexibility.
        (iii) On-line inspection.   (iv) Computer-Integrated manufacturing.
   (b) Explain the following types of automation:
        (i) Flexible automation.   (ii) Fixed automation.

2 (a) Discuss the general methods of transporting work pieces on flow lines.
   (b) Briefly discuss the following related to the efficiency of an automated flow lines:
        (i) Efficiency of line with storage buffer. (ii) Efficiency of line without storage buffer.

3 (a) Explain the analysis of transfer lines without storage.
   (b) Define the configuration of an automated flow lines. Discuss the two configurations of automated flow line and their selection.

4 (a) Discuss any four methods that should be considered by the designer of a flow line for improving the efficiency of the assembly line.
   (b) Define and discuss briefly about the following terms used in line balancing:
        (i) Balance delay.   (ii) Total work content. (iii) Precedence constraints.

5 (a) Discuss the effect of plant layout in the design of material handling systems.
   (b) Explain the quantitative relationships and analysis of AGV systems.

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   What is the objective of adaptive control with constraints? Draw the block diagram of a typical computerized adaptive control with constraints system for turning operation and explain in detail.

8 (a) What are the advantages of various rapid prototyping techniques?
   (b) Briefly explain the software configuration of business process re-engineering.

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