

2006 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

IV B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS  
**AUTOMATION IN MANUFACTURE**  
(PRODUCTION ENGINEERING)

Apr/May 2006

TIME – 3 HOUR  
MARK – 80

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**Answer any FIVE Questions**  
**All Questions carry equal marks**

1.(a) Discuss the following automation strategies:

- i. Combined Operations
- ii. On-line inspection
- iii. Plant Operation Control
- iv. Process Control and Optimization

(b) List out the various hydraulic components that can be used in automated manufacturing systems. Explain them briefly.

[10+6]

2. (a) Explain the following rotary transfer mechanisms with the help of neat sketches:

- i. Geneva Mechanism
- ii. Ratchet and Pawl Mechanism

(b) Explain the differences between intermittent transfer mechanism and power and-free transfer mechanism.

[8+8]

3. (a) Discuss the analysis of the performance of a partially automated flow line without buffer storage.

(b) What are the reasons for the implementation of automated flow lines in the production units? Explain briefly.

[8+8]

4. (a) What are the different manual methods for solving the line balancing problems? Briefly discuss any one method.

(b) Discuss the following ways for improving the performance of the line balance:

- i. Dividing work elements
- ii. Pre assembly of components

iii. *Inventory Buffers between stations*

[6+10]

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.*

[8+8]

6. (a) *Explain the following components of an AS/RS:*

i. *Storage/Retrieval machine*

ii. *Storage modules.*

(b) *“The work-in-process storage systems are a systematic method for managing work-in-process in batch production factories”-Explain the reasons.*

[8+8]

7. *Draw the block diagram of Adaptive Control with Optimization system for milling and explain each block in detail.*

[16]

8. (a) *Which type of Rapid Prototyping systems use a liquid as starting material? Discuss any one such RP system.*

(b) *Define ‘Business Process Reengineering’. Discuss how the Business Process Reengineering tool will enhance the performance of companies to survive in the emerging competitive environment.*

[16]