

A

1000MRT401052302



Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Regular and Supplementary Examination December 2023 (2019 Scheme)

Course Code: MRT401

Course Name: ADVANCED AUTOMATION SYSTEMS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

- | | | Marks |
|----|---|-------|
| 1 | Why Manual labour is unavoidable in manufacturing? | (3) |
| 2 | Classify the two categories of Production system? | (3) |
| 3 | Define the levels of automation? | (3) |
| 4 | Explain safety monitoring in an automated system? | (3) |
| 5 | Identify the function of a computer control system? | (3) |
| 6 | Describe the production machine and its types? | (3) |
| 7 | Differentiate contact and non- contact inspection techniques? | (3) |
| 8 | What is production flow analysis? | (3) |
| 9 | List the FMS application and benefits? | (3) |
| 10 | What are the three functions of machine vision? | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

- 11 a) Suppose a company has designed a new product line and is planning to build a new plant to manufacture this product line. The new line consists of 100 different product types, and for each product type the company wants to produce 10,000 units annually. The products average 1,000 components each, and the average number of processing steps required for each component is 10. All parts will be made in the factory. Each processing step takes an average of 1 min. (7)
- Determine
- (a) how many products
 - (b) how many parts
 - (c) how many production operations will be required each year
 - (d) how many workers will be needed in the plant, if each worker works 8 hr per shift for 250 days/year?

- b) What are the Limitation and capability of a manufacturing plant? (7)

OR

- 12 a) Define production system? (3)
b) Explain the two categories of production system with neat block diagram? (11)

Module II

- 13 a) Explain in detail about the basic elements of an automated system? (11)
b) Define the Programmable logic controller? (3)

OR

- 14 a) What's the difference between a process parameter and a process variable? (4)
b) Compare the working of Direct digital control and Numerical control. Construct the working diagram? (10)

Module III

- 15 a) Classify Type 1, Type 2 and Type 3 manufacturing system? (6)
b) List and explain the four basic components of a Manufacturing system? (8)

OR

- 16 a) Describe material handling in production machines? (7)
b) Explain learning curves? (7)

Module IV

- 17 a) Define cellular manufacturing? (3)
b) Explain contact and non- contact inspection techniques with an appropriate techniques? (11)

OR

- 18 a) Differentiate production flow analysis and cellular manufacturing? (10)
b) List the application of group technology? (4)

Module V

- 19 a) What is mean by flexibility in FMS? (4)
b) Explain the FMS and describe the FMS components? (10)

OR

- 20 a) What is machine vision and how the function of machine vision is classify? (11)
b) List the application of machine vision? (3)
