APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY

Reg No.:_____   Name:_____

08 PALAKKAD CLUSTER

Question Paper Code: M.Tech S2 (R,S) Exam June 2022

IAR0822212-I   (Pages: 2)

                                    Reg. No: ....

SECOND SEMESTER M.TECH. DEGREE EXAMINATION JULY 2022

Branch: Mechanical Engineering   **Specialization: Industrial Automation and Robotics**

08ME6312 INDUSTRIAL AUTOMATION

Time: 3 Hours   **Max. Marks: 60**

Answer all six questions.
Modules 1 to 6: Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q. No.	Module 1	Marks
1.a	What is a storage buffer? What is its function?	3
	Answer b or c	
b	Explain various reasons for implementing automation of manufacturing systems.	6
c	What do you mean by transfer lines? Give examples.	6

Q. No.	Module 2	Marks
2.a	What do you mean by the terms *accessibility* and *system throughput* in storage systems?	3
	Answer b or c	
b	Discuss briefly the types of storage location strategies employed in material handling.	6
c	What is meant by AS/RS? How is it implemented in FMS?	6

Q. No.	Module 3	Marks
3.a	How are images interpreted in Machine Vision?	3
	Answer b or c	
b	Discuss the procedure and applications of automated inspection in manufacturing.	6
c	Discuss the basic functions of machine vision with a neat sketch.	6

Q. No.	Module 4	Marks

4.a What do you mean by *Adaptive control*? Differentiate it with *Feedback control*. — 3

Answer b or c

b Explain how sequential logic control is achieved? Draw & explain its control system. — 6

c List the four main control system technologies used for industrial automation and briefly explain them. — 6

Q. No.	Module 5	Marks

5.a What are the main types of interfaces used in SCADA? — 4

Answer b or c

b Draw ladder diagram for (i) ON/OFF (ii) Both direction operation of a DC motor controlled by switches. — 8

c Draw & explain SCADA hardware architecture. — 8

Q. No.	Module 6	Marks

6.a What do you mean by *black box models*? — 4

Answer b or c

b How supervisory or digital control is applied to control the temperature in any heat treatment process? Draw and explain its control system. — 8

c Explain the features of Distributed Control System (DCS) for thermal power plants. — 8