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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2024

Industrial Engineering

VIth Semester

IE5651 Manufacturing Automation

(Regulation 2019)

Max.Marks: 100

Time:3hrs

CO 1	Selection of automated equipment with cost justification.
CO 2	Ability to understand control technologies.
CO 3	Selection of buffer size and location in transfer lines.
CO 4	Ability to prepare a simple CNC program, select a robot configuration for given application.
CO 5	Recommend an appropriate automated material handling, storage and data capture method.

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A (10x2 = 20 Marks)

(Answer all Questions)

Q. No.	Questions	Marks	CO	BL
1	Automation needs high capital investment. How will you persuade management to go for automation?	2	CO1	L2
2	What is Manufacturing Lead Time? Give an Example.	2	CO1	L2
3	What type of control is required for the control of chemical parameters in a processing plant? Give reasons	2	CO2	L3
4	State any two of sensor used for measuring the availability of material on the conveyor	2	CO2	L2
5	Buffers helps in improving productivity- Justify	2	CO3	L3
6	What is line unbalancing concept?	2	CO3	L1
7	Enlist the elements of CNC machine.	2	CO4	L1
8	State the advantages of SCARA robot configuration	2	CO4	L2
9	Justify the need for AS/RS systems in industries	2	CO5	L2
10	Write few advantages of automatic data capturing technology	2	CO5	L2

PART- B (5x 13=65Marks)

Q. No.	Questions	Marks	CO	BL
11 (a)	Explain the various phases of automation migration strategy in detail	13	CO1	L2
OR				
11 (b)	Enlist and explain the strategies for automation and production systems	13	CO1	L2
12 (a)	Compare the continuous control system and Discrete control system in the aspects of working principle and application requirements.	13	CO2	L3
OR				
12 (b)	For an input signal of 6.8V apply successive approximation method to encode the signal for a 6-Bit register for an ADC with full scale range of 10V.	13	CO2	L3
13 (a)	Explain the Construction, Working, and applications of transfer mechanism and rotary indexing mechanism.	13	CO3	L2
OR				
13 (b)	Explain the basic control functions of an automated transfer lines in detail along with the auxiliary control functions	13	CO3	L2
14 (a)	Enlist any 3 types of end effectors. Explain their industrial applications of those end effectors.	13	CO4	L3
OR				
14 (b)	Enlist the four basic types of statements in APT Language. Give examples syntax for part programming in those statements	13	CO4	L3
15 (a)	Enumerate the types of AS/RS systems. Explain the working and specific applications for each type of system.	13	CO5	L3
OR				
15 (b)	Explain any two vehicle guidance technology for AGVs also compare their suitability for different applications.	13	CO5	L3

PART- C (1x 15=15Marks)

(Q.No.16 is compulsory)

Q. No.	Questions	Marks	CO	BL
16.	Construct a problem statement of your own that requires any two types of logic gates, two input devices and two output devices. Develop truth table for the statement. Use Ladder logic to explain the code for working of the PLC.	15	CO1	L5