Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

RA3EL02 Industrial Automation

Programme: B.Tech. Branch/Specialisation: RA

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Break-even analysis is carried out to find the point where the following are equal- **1**

(a) Overhead cost and fixed cost
(b) Holding cost and ordering cost
(c) Sales volume value and overall cost
(d) To increase the production

ii. The lead time is defined as- **1**

(a) The length of time before a stockout occurs
(b) The length of time between ordering and receiving an inventory order
(c) The length of time that it takes to order inventory
(d) The time before production can be resumed

iii. Reasoning from a goal state towards an initial state is called- **1**

(a) Backward chaining (b) Bidirectional
(c) Breadth first (d) Heuristic

iv. Types of Automated flow line- **1**

(a) In-Line type (b) Circle type
(c) Square type (d) Motion type

v. Which one of the following is more expensive? **1**

(a) RFID (b) Barcode (c) Both (a) and (b) (d) None of these

vi. Set of parallel printed lines with different thickness of black and white characters is called- **1**

(a) White code (b) Magnetic code
(c) Colored code (d) Bar code

P.T.O.

vii. _____ is used for temperature measurement. **1**
(a) Thermocouple (b) Venturi meter
(c) Manometer (d) Rotameter

viii. Quality of a product is at its lowest when _____ quality component is neglected while it's manufacturing. **1**
(a) Performance (b) Reliability
(c) Aesthetics (d) Serviceability

ix. The SCADA systems used to _____. **1**
(a) Monitor (b) Man-power
(c) Decrease (d) Transportation

x. The SCADA systems which of the following gathers data from remote locations? **1**
(a) PAC (b) HMI (c) PLC (d) RTU

Q.2 i. What is a production system? **2**
ii. What are the reasons why companies automate their operations? Give any three reasons. **3**
iii. The text lists ten strategies for automation and process improvement. Identify five of these strategies. **5**
OR iv. What are the three phases of a typical automation migration strategy? **5**

Q.3 i. What is buffer storage? **2**
ii. Explain automated flow lines with storage buffer & partial automation. **8**
OR iii. What do you understand by computer simulation of automated flow lines? Explain in detail. **8**

Q.4 i. Explain about the types of material handling equipment. **3**
ii. What is interfacing handling and storage with manufacturing? **7**
OR iii. Explain in detail about conveyor system and automated guided vehicle system. **7**

Q.5 i. What is statistical quality control? **4**
ii. What are coordinate measuring machines? **6**
OR iii. What are some sensor technologies for automated inspection? **6**

Q.6 Attempt any two:
i. What is SCADA system? **5**
ii. Explain the continuous and discreate control system. **5**
iii. What is computer process control and explain its forms? **5**

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Marking Scheme
RA3EL02 Industrial Automation

Q.1	i.	(c) Sales volume value and overall cost	1 Mark	**1**
	ii.	(b) The length of time between ordering and receiving an inventory order	1 Mark	**1**
	iii.	(a) Backward chaining	1 Mark	**1**
	iv.	(a) In-Line type	1 Mark	**1**
	v.	(a) RFID	1 Mark	**1**
	vi.	(d) Bar code	1 Mark	**1**
	vii.	(a) Thermocouple	1 Mark	**1**
	viii.	(a) Performance	1 Mark	**1**
	ix.	(a) Monitor	1 Mark	**1**
	x.	(d) RTU	1 Mark	**1**
Q.2	i.	Production system	2 Marks	**2**
	ii.	The reasons why companies automate their operations	1.5 Marks	**3**
		Give any three reasons.	1.5 Marks	
	iii.	The text lists ten strategies for automation and process improvement.	3 Marks	**5**
		Identify five of these strategies.	2 Marks	
OR	iv.	Three phases of a typical automation migration strategy	5 Marks	**5**
Q.3	i.	Buffer storage	2 Marks	**2**
	ii.	Explain automated flow lines with storage buffer	3 Marks	**8**
		Partial automation.	5 Marks	
OR	iii.	Computer simulation of automated flow lines & explanation in detail.	8 Marks	**8**
Q.4	i.	Explain about the types of material handling equipment.	3 Marks	**3**
	ii.	Interfacing handling and storage with manufacturing	7 Marks	**7**
OR	iii.	Conveyor system and automated guided vehicle system.	7 Marks	**7**
Q.5	i.	Statistical quality control	4 Marks	**4**
	ii.	Coordinate measuring machines	6 Marks	**6**
OR	iii.	Sensor technologies for automated inspection	6 Marks	**6**
Q.6		Attempt any two:		
	i.	SCADA system	5 Marks	**5**
	ii.	Continuous and discreate control system.	2.5 Marks each (2.5 Marks*2)	**5**
	iii.	Computer process control	3 Marks	**5**
		Explain its forms	2 Marks	

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