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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E.

Semester : VII

Branch: Mechanical Engineering

Duration: 3 hrs.

Course Code: 22ME7PEIN4

Max Marks: 100

Course: Industry 4.0

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I			<i>CO</i>	<i>PO</i>	Marks
1	a)	Explain the concept of business transformation and describe the factors that drive successful business transformation in an organization.	<i>CO1</i>	<i>PO3</i>	08
	b)	Discuss the stages involved in organizational transformation. How can resistance to change be managed during this process?	<i>CO1</i>	<i>PO3</i>	08
	c)	Explain industrial transformation.	<i>CO1</i>	<i>PO3</i>	04
OR					
2	a)	Discuss the importance of transformation in industrial manufacturing. How can smart manufacturing techniques improve efficiency and productivity?	<i>CO1</i>	<i>PO3</i>	08
	b)	Explain the future trends and challenges associated with industrial transformation? How should companies prepare for these changes?	<i>CO1</i>	<i>PO3</i>	08
	c)	What role does technology play in business transformation?	<i>CO1</i>	<i>PO3</i>	04
UNIT - II					
3	a)	Explain the concept of engineering process automation and describe its role in improving productivity and quality in engineering projects.	<i>CO2</i>	<i>PO3</i>	08
	b)	Discuss the benefits and challenges associated with manufacturing process automation. How does it contribute to modern manufacturing efficiency?	<i>CO2</i>	<i>PO3</i>	08
	c)	Explain digital process automation (DPA).	<i>CO2</i>	<i>PO3</i>	04
OR					

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

	4	a)	Explain how manufacturing process automation has evolved with the introduction of Industry 4.0 technologies like AI, IoT, and robotics.	CO2	PO3	08
		b)	Describe the challenges organizations face when integrating robotic process automation (RPA) with existing systems. How can these challenges be mitigated?	CO2	PO3	08
		c)	What are the main challenges in implementing engineering process automation?	CO2	PO3	04
			UNIT - III			
	5	a)	Describe the First Industrial Revolution. What were its main innovations, and how did it impact society and the economy?	CO3	PO3	08
		b)	Explain the concept of collaborative robots (cobots). Discuss their applications in manufacturing and how they improve productivity and safety.	CO3	PO3	08
		c)	Explain the concept of the fifth Industrial Revolution (Industry 5.0).	CO3	PO3	04
			OR			
	6	a)	Explain the major changes brought about by the second Industrial Revolution. How did these changes influence industrial productivity?	CO3	PO3	08
		b)	Explain cyber-physical systems (CPS). How do CPS integrate physical processes with computing and networking systems?	CO3	PO3	08
		c)	Explain the role does AI play in the fourth Industrial Revolution?	CO3	PO3	04
			UNIT - IV			
	7	a)	Explain the role of PLC and SCADA systems in process control. How can SMEs benefit from implementing these systems in their operations?	CO4	PO3	08
		b)	Describe predictive maintenance in heat process systems. How does it differ from traditional maintenance methods, and what benefits does it offer?	CO4	PO3	08
		c)	Explain the role of automation in the solar energy sector.	CO4	PO3	04
			OR			
	8	a)	Discuss the role of virtual reality (VR) and augmented reality (AR) in process automation. Provide examples of their applications in industrial settings.	CO4	PO3	08
		b)	Describe the transformation brought about by process automation in the solar energy sector. How has automation improved	CO4	PO3	08

		efficiency, reliability, and cost-effectiveness?			
	c)	Explain the predictive maintenance in heat process systems?	CO4	PO3	04
UNIT - V					
9	a)	Explain the business need for industrial transition. How can companies benefit from adapting to new industrial paradigms?	CO5	PO3	08
	b)	Discuss the major challenges faced by organizations during industrial transition. Provide examples of how these challenges can impact the transition process.	CO5	PO3	08
	c)	List out the challenges in industrial transition.	CO5	PO3	04
OR					
10	a)	Describe how internal and external factors influence industrial transition strategy planning. Give examples of each type of factor.	CO5	PO3	08
	b)	Discuss the impact of digital transformation on the workplace of the future. How will roles and skills change as a result?	CO5	PO3	08
	c)	Discuss the benefits of successful industrial transition?	CO5	PO3	04
