Name: Enrolment No:	

UPES

End Semester Examination, December 2023

Course: Digital Transformation and Innovation in Manufacturing Ecosystem Semester: V

Program: INT BBA+MBA (OM) **Time: 03 hrs.**

Course Code: STGM3015 **Max. Marks: 100**

Instructions:

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q 1	Attend (MCQ's) All questions are Compulsory		CO1
(i)	What is a key driver for digital transformation in manufacturing? ▶ a) Reduced labour costs ▶ b) Increased supply chain complexity ▶ c) Decreased demand for products ▶ d) Shortage of raw materials	2	
(ii)	What role does data analytics play in digital transformation in manufacturing? ▶ a) Data analytics is no longer relevant. ▶ b) It helps in decision-making and process optimization. ▶ c) It only benefits marketing departments. ▶ d) It can only be used for historical data analysis.	2	
(iii)	What is the primary goal of digital transformation in manufacturing? ▶ a) Maintain traditional processes ▶ b) Increase manual labour ▶ c) Enhance operational efficiency ▶ d) Reduce technological innovation	2	
(iv)	What is the primary benefit of adopting 3D printing in manufacturing? ▶ a) Increased material waste ▶ b) Mass production capability ▶ c) Customization and rapid prototyping ▶ d) Reduced tooling costs	2	
(v)	How does the Internet of Things (IoT) contribute to digital transformation in manufacturing? ▶ a) It increases human intervention.	2	

	▶ b) It provides real-time data and remote monitoring. ▶ c) It decreases automation. ▶ d) It hinders data collection.		
(vi)	Which of the following is a key trend in smart manufacturing? ▶ a) Static production processes ▶ b) Seamless connectivity and integration ▶ c) Manual quality control ▶ d) Isolation of production systems	**2**	
(vii)	What is the significance of augmented reality in manufacturing? ▶ a) It does not have any applications in manufacturing. ▶ b) It improves employee engagement. ▶ c) It enables real-time data visualization and remote assistance. ▶ d) It slows down production processes.	**2**	
(viii)	What is the primary driver for the adoption of digital twin technology in manufacturing? ▶ a) Increased reliance on physical prototypes ▶ b) Enhanced product quality ▶ c) Greater demand for manual labour ▶ d) Improved product lifecycle management	**2**	
(ix)	Which of the following is a key driver for sustainability in digital transformation in manufacturing? ▶ a) Increased waste generation ▶ b) Growing environmental concerns ▶ c) Reduced focus on green initiatives ▶ d) Shorter product lifecycles	**2**	
(x)	What is the primary objective of digital transformation in manufacturing supply chains? ▶ a) Maintain traditional supply chain processes ▶ b) Increase paper-based documentation ▶ c) Enhance visibility, efficiency, and responsiveness ▶ d) Reduce the need for supply chain management	**2**	
SECTION B 4Qx5M= 20 Marks			
Q 2	All the questions are compulsory		**CO4**
(i)	What is digital transformation in the manufacturing ecosystem?	**5**	
(ii)	How does digital transformation impact innovation in manufacturing?	**5**	
(iii)	How does Industry 4.0 relate to digital transformation in manufacturing?	**5**	

(iv)	What is the role of data analytics in the manufacturing ecosystem's digital transformation?	**5**	
SECTION-C 3Qx10M=30 Marks			
Q 3	Attempt any all Question's. Third Question is having internal Choice.		**CO5**
(i)	What are the challenges and opportunities for small and medium-sized manufacturing enterprises (SMEs) in adopting digital transformation strategies?	**10**	
(ii)	What is the significance of cybersecurity in the context of digital transformation in manufacturing, and what measures should companies take to protect their systems and data?	**10**	
(iii)	How has digital transformation revolutionized the traditional manufacturing ecosystem, and what are the key drivers behind this transformation? OR How can the integration of additive manufacturing (3D printing) and digital twin technology drive innovation in product design, prototyping, and production?	**10**	
SECTION-D 2Qx15M= 30 Marks			
Q 4	Attempt any all Question's. Second Question is having internal Choice.		**CO2**
(i)	Discuss the role of data analytics and artificial intelligence in enhancing decision-making processes and predictive maintenance in manufacturing.	**15**	
(ii)	What are the potential socio-economic and environmental implications of digital transformation in the manufacturing ecosystem, and how can sustainability be integrated into these innovations? OR Case Study: Digital Transformation and Innovation in Manufacturing Ecosystem In recent years, the manufacturing industry has undergone a significant transformation driven by digital technologies and innovation. A case study of a manufacturing company, XYZ Manufacturing Inc., provides insights into how digital transformation and innovation have shaped its operations and competitiveness. Company Background: XYZ Manufacturing Inc. is a medium-sized manufacturing company specializing in the production of automotive components. Established in 1980, the company has a rich history of traditional manufacturing	**15**	

	processes. However, as the industry evolved, XYZ Manufacturing Inc. faced challenges related to increasing competition, quality control, and efficiency. Digital Transformation Initiatives: Adoption of IoT (Internet of Things): XYZ Manufacturing Inc. integrated IoT sensors into its production equipment and machinery. These sensors collected real-time data on equipment performance, energy usage, and product quality. This data was analyzed to identify maintenance needs and optimize production processes. Implementing Industry 4.0 Principles: The company embraced Industry 4.0 concepts, connecting its entire manufacturing ecosystem. This allowed for seamless communication between machines, products, and systems, enabling efficient production, real-time monitoring, and predictive maintenance. AI and Machine Learning for Quality Control: XYZ Manufacturing Inc. implemented AI and machine learning algorithms to detect defects in real-time. This reduced product defects and improved overall product quality. Digital Supply Chain Management: The company streamlined its supply chain operations by using digital technologies. It improved supplier collaboration, reduced lead times, and optimized inventory management. Innovation Initiatives: Cross-Functional Teams: XYZ Manufacturing Inc. established cross-functional teams, bringing together engineers, data scientists, and manufacturing experts to collaborate on new product development and process improvement. Continuous Learning and Training: The company invested in employee training programs to enhance digital skills. This empowered the workforce to adapt to the evolving manufacturing environment. Customer-Centric Approach: XYZ Manufacturing Inc. actively sought customer feedback and incorporated it into product design and innovation. This resulted in products that met market demands more effectively. Questions:		

	1. What were the key digital transformation initiatives that XYZ Manufacturing Inc. implemented, and how did they impact the company's operations and competitiveness? 2. How did innovation initiatives, such as cross-functional teams and a customer-centric approach, contribute to XYZ Manufacturing Inc.'s success in the digital transformation journey?		