

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: MTECH/PRE-PHD
BRANCH: PIE**

**SEMESTER : I
SESSION : MO/2025**

SUBJECT: PE523 MANUFACTURING STRATEGIES

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	“A global company producing industrial pumps wants to shift from a mass production system to a flexible manufacturing system (FMS) to handle product variety and customer customization.” Analyze how this change fits into the conceptual framework of manufacturing strategy and What strategic planning steps are essential to ensure a successful transition?	[5] 1	3
Q.1(b)	“A precision engineering firm follows Lean manufacturing but faces new market pressures requiring rapid product innovation.” Discuss whether Lean philosophy still aligns with the new business strategy and how the company could integrate Agile manufacturing into its manufacturing strategy.	[5] 1	3
Q.2(a)	Discuss the evolution of manufacturing systems from DMS → FMS → CMS → RMS, focusing on: (i) Changing market demands (ii) Advances in automation and IT	[5] 2	4
Q.2(b)	Explain the concept of a Reconfigurable Manufacturing System. Discuss the advantages and challenges associated with implementing RMS in modern manufacturing industries.	[5] 2	3
Q.3(a)	Describe the steps involved in part classification and coding along with different types of classification and coding systems	[5] 3	2
Q.3(b)	“A company is considering implementing Group Technology to reduce setup time and WIP inventory.” (i) Identify economic factors that must be analyzed before implementation. (ii) Discuss how the cost-benefit analysis can justify the shift to GT.	[5] 3	3
Q.4(a)	Analyse the synergy between TQC and Lean principles in improving manufacturing performance.	[5] 4	3
Q.4(b)	Compare TQC, TQM, and Six Sigma in terms of philosophy, tools, and focus.	[5] 4	2
Q.5(a)	How can bottleneck identification improve system throughput using TOC principles?	[5] 5	2
Q.5(b)	“A chemical processing company reports 5% rework and 2% defect rates in production. Management decides to adopt Six Sigma (DMAIC).” (i) Outline the DMAIC steps that should be followed.	[5] 5	3

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