BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID-SEMESTER EXAMINATION MO/2024)

CLASS: BE **SEMESTER: V/ADD**
BRANCH: PRODUCTION AND INDUSTRIAL ENGINEERING **SESSION: MO/2025**

SUBJECT: PE318 RAPID PROTOTYPING AND TOOLING

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions, each of 5 marks and a total of 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper, etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1	Critically analyze the role of rapid prototyping within the engineering design cycle of a new product. How does it influence decision-making and innovation?	[5]	1	2,3,4
Q.2	Evaluate the cost implications of manufacturing a product using rapid prototyping (RP) in comparison with conventional manufacturing methods. Justify which method is more economical for low-volume, high-mix production, and explain your reasoning	[5]	1,2,3	3,4,5
Q.3	Using a suitable diagram, critically explain the working principle of stereolithography (SLA). Further, analyze and compare the free-surface and constrained-surface SLA.	[5]	2,3	3,4
Q.4	Assess the suitability of different additive manufacturing methods for manufacturing a metal product. Select a specific metal product of your choice, justify the most appropriate method for its production, and explain the working principle of the chosen method using a relevant diagram.	[5]	2,3	2,3,4
Q.5	Critically analyze whether every STL file is 3D printable. What key factors determine the printability of an STL file? Illustrate your explanation with suitable diagrams or examples	[5]	3,4	3,4

:::::23/09/2025 :::::M