Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 13 – 12- 2025 **Time:** 01:00pm – 04:00pm

School: SOE	**Program:** B.Tech	
Course Code: MEC3057	**Course Name:** Integrated Product Design and Development	
Semester: VII	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5	CO6
Marks	10	10	18	18	22	22

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Attribute any two main reasons why cloud platforms are preferred for global design collaboration	**2 Marks**	**L4**	**CO6**
2.	Identify the causes of delays in outsourced product development projects involving multiple countries	**2 Marks**	**L4**	**CO5**
3.	How can Virtual Reality (VR) be applied to identify ergonomic risks during an immersive design review of a workstation layout?	**2 Marks**	**L3**	**CO3**
4.	Demonstrate how VR-based immersive simulations can be used to analyze spatial conflicts and design improvements in a complex product assembly environment	**2 Marks**	**L3**	**CO3**
5.	How can Mixed Reality (MR) tools be used to apply real-time visual overlays for improving assembly accuracy on the shop floor?	**2 Marks**	**L3**	**CO3**
6.	How can MR/AR-based digital instructions help technicians identify assembly errors quickly during live operations?	**2 Marks**	**L3**	**CO3**
7.	Outline any two main sources of manufacturing complexity in a selected product	**2 Marks**	**L4**	**CO4**

8.	Compare the original and modified designs and identify any two key DFM changes	**2 Marks**	**L4**	**CO4**
9.	Outline any two key parameters used to judge manufacturability performance	**2 Marks**	**L4**	**CO4**
10.	Differentiate between sequential and parallel design workflows	**2 Marks**	**L4**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	How can interactive simulation be used to evaluate safety margins in a design?	**10 Marks**	**L3**	**CO2**
		Or			
12.	**a.**	How would you define key parameters to set up a simulation for a mechanical part?	**10 Marks**	**L3**	**CO2**
13.	**a.**	Describe the key elements that form the core concepts of product design	**10 Marks**	**L2**	**CO1**
		Or			
14.	**a.**	Explain the difference between product design and product development	**10 Marks**	**L2**	**CO1**
15.	**a.**	Evaluate the effectiveness of digital twins in predicting potential design bottlenecks before physical prototype development	**10 Marks**	**L4**	**CO4**
		Or			
16.	**a.**	Analyze how real-time sensor feedback integrated into a digital twin improves operational decision-making	**10 Marks**	**L4**	**CO4**
17.	**a.**	Demonstrate the application of real-time simulation models to communicate design changes and evaluate their impact on system performance	**10 Marks**	**L3**	**CO3**
		Or			
18.	**a.**	Use rapid prototyping workflows to explain how iterative communication between designers and users can be improved	**10 Marks**	**L3**	**CO3**
19.	**a.**	Analyse the challenges faced by multinational engineering teams due to varied communication styles, and evaluate their effect on project coordination and design accuracy	**20 Marks**	**L4**	**CO5**
		Or			

20.	**a.**	Compare the effectiveness of verbal, non-verbal, and technology-mediated communication among culturally diverse engineering teams	**20 Marks**	**L4**	**CO5**

21.	**a.**	Analyse how extended and virtual factories rely on cloud computing for end-to-end product lifecycle integration	**20 Marks**	**L4**	**C06**
		Or			
22.	**a.**	Analyse how the adoption of multi-cloud and hybrid cloud architectures supports global product development	**20 Marks**	**L4**	**C06**