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

CLASS: MTECH **SEMESTER : IST**
BRANCH: PROD & IND ENGG **SESSION : MO/2025**

SUBJECT: PE503 PLANNING & CONTROL OF PRODUCTION SYSTEM

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.

			CO	BL
Q.1(a)	Analyze how disturbances in one component of the generalized production system affect overall system performance.	[5]	1	3
Q.1(b)	Compare the characteristics and operational challenges of manufacturing versus service production systems.	[5]	1	4
Q.2(a)	The following table shows the actual demand for a product over 5 months:	[5]	2	3

Month	Actual Demand (Units)
1	200
2	250
3	240
4	260
5	300

Use Exponential Smoothing with a smoothing constant (α) = 0.3 to forecast the demand for Month 6. Assume that the forecast for Month 1 (F_1) was 200 units.

Q.2(b)	Describe the steps involved in solving a facility location problem using the center of gravity method.	[5]	2	4
Q.3(a)	Explain how loading and capacity planning are interrelated.	[5]	3	2
Q.3(b)	Describe various dispatching rules (e.g., FCFS, SPT, EDD) and discuss their practical uses.	[5]	3	3
Q.4(a)	A company plans to shift from batch production to mass production. Apply production system characteristics to justify whether this transition is feasible.	[5]	4	3
Q.4(b)	Illustrate a generalized production system for a manufacturing unit of your choice and identify the major inputs, transformation processes, and outputs.	[5]	4	4
Q.5(a)	Analyze challenges in inventory control in process industries such as chemical or cement plants.	[5]	5	4
Q.5(b)	Explain the core principles of JIT: pull system, takt time, continuous flow, and quality at source.	[5]	5	2

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