

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

CLASS: B.TECH
BRANCH: PIE

SEMESTER : IV
SESSION : SP/2023

SUBJECT: PE218 PRODUCTION AND OPERATIONS MANAGEMENT

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) Explain the characteristics of different types of production systems along with volume and variety relationship. | [5] | 1 | 1 |
| Q.1(b) Differentiate between manufacturing operations and service operations. | [5] | 1 | 2 |
| Q.2(a) The demand for electrical power over the period 2018-2023 is given below. Find a straight-line trend to these data and forecast for 2024 demand. | [5] | 2 | 4 |

Year	2018	2019	2020	2021	2022	2023
Electrical Power demand	75	79	80	90	110	142

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| Q.2(b) Product "A" requires two components of "B" and three components of "C". Each "B" requires two components of "D" and two components of "E". Each "C" requires two components of "E" and two components of "F". Each "F" requires One Component of "G" and two components of "D". Calculate the number of components of each items required to satisfy the demand of 50 Numbers of Product "A" . | [5] | 2 | 5 |
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Component	A	B	C	D	E	F	G
Lead time (in weeks)	1	2	1	1	2	3	2

Determine the gross material requirements plan for Product "A" based on lead time.

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| Q.3(a) A group of five jobs are to be processed through two machines. The first operation is cleaning and second operation is drilling. Determine the sequence that will minimize the total completion time for this group of jobs. Processing time is given below: | [5] | 3 | 5 |
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JOB	A	B	C	D	E
Work Centre 1	5	3	8	10	7
Work Centre 2	2	6	4	7	12

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| Q.3(b) Explain the functions of production planning. | [5] | 3 | 3 |
| Q.4(a) A company would like to reduce its inventory cost by determining the optimal number of product "X" to obtain per order. The annual demand is 1500 Units, the set up cost or ordering cost is Rs 15 per order, the holding cost per unit per year is Rs 1.5. Calculate i) optimal numbers of units per order. ii) Expected numbers of order iii) Expected time between orders. | [5] | 4 | 4 |
| Q.4(b) Write short notes on i) ABC Analysis ii) VED Analysis. | [5] | 4 | 1 |

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| Q.5(a) Reliance Super Mart has locations in A1,A2,A3,A4,A5, They are currently being supplied by A1 warehouse which is now outdated. The firm wants a central location to be built for a new warehouse. Determine the new location. | [5] | 5 | 4 |
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Store	A1	A2	A3	A4	A5
X,Y Coordinates	30,50	60,80	20,70	40,50	85,90
Weekly Requirements	20000	15000	10000	25000	5000

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| Q.5(b) Explain facility location and facility layout with suitable example. | [5] | 5 | 3 |
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