UNIVERSITY OF PETROLEUM & ENERGY STUDIES
End semester Examination – May, 2021

Course: Production Planning and Control **Semester: II**
Subject/: MBA General(Operations) **Time: 3 Hours**
Course Code: LSCM 7010P **Max. Marks: 100**

SECTION A
1. Each Question will carry 5 Marks
2. Instruction: Complete the statement / Select the correct answer(s)

S.No.	Question	COs
Q 1	The three general categories of strategic approaches used as a part of Sales and Operations Planning are _____, _____ and _____	CO2
Q 2	The common lot sizing methods discussed in class are _____	CO2
Q 3	The facility layout problem is considered as _____ problem and solved using _____and _____ algorithms as discussed in research articles in class.	CO1
Q 4	The process of breaking down of aggregate plan into finer detail is called _____.	CO3

Q 5	Which of the following is a quantitative forecasting method
	    a) Delphi Technique b) Holt's model
	    c) Exponential Smoothing d) Winter's model
		CO2

Q 6	MRP is a scheme for converting _____ into a planned schedule of raw materials, components and sub-assemblies orders.	CO1

SECTION B
1. Each question will carry 10 marks
2. Instruction: Solve the numerical problems

Q 7	For the below demand data set apply the Wagner-Whitin Algorithm | Period	1	2	3	4	5
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Demand	50	80	180	80	0 | Setup Cost(Ordering Cost) = Rs. 206, Inventory Carrying Cost = Rs. 4 per part period The formula for the same is given as under:	CO3

	$$\text{Let } F(t) = \min\left[\min\left[s_j + \sum_{h=j}^{t-1}\sum_{k=h+1}^{t} i_h d_k + F(j-1)\right], s_t + F(t-1)\right]$$	

Q 8	There are two items with the data given below. The restriction on total number of orders is 18. Find the EOQ value for individual items and total cost.	CO2

	Item 1	Item 2
Annual Demand	10000	20000
Order Cost	300	300
Unit Price	20	25
Interest Rate	20%	25%

Q 9	You are given a time series model with demand values 4,7,9,13,16, and 18. Fit a linear model using Holt's method and find the forecast for period 6. Given $\alpha = 0.2$, $\beta = 0.3$	CO3

Q 10	Consider the three-machine problem shown below. Find out the optimum makespan using the extension of the Johnson's algorithm.	CO4

Job	$tj1$	$tj2$	$tj3$
1	3	8	10
2	12	9	12
3	8	6	16
4	12	10	13

Q 11	Consider a single item with annual demand 10000/year. Ordering cost is Rs. 300 per order, Carrying cost is Rs. 4/unit/year and Shortage cost is Rs. 25/unit/year. Calculate the economic ordered quantity, backordering quantity and total inventory cost.	CO2

Section C

1. Each Question carries 20 Marks.

2. Instruction: Answer any one question from the analytical questions

Q 12	1. Consider the matrix of closeness of five facilities shown in table below. Provide a solution using ALDEP and using CORELAP.	CO4

	1	2	3	4	5
1	--	A	I	O	A
2		--	O	X	U
3			--	O	A
4				--	I
5					--

OR

2. Product A is made from two components, B and C. It takes one B and three
   C's to make a single product A. Component B is made from two parts
   D's. Component C is made from one part D and 2 part E's. Use this
   information together with data below to answer the following questions:

Part	Lead Time	Lot Size	On hand	Scheduled Rcpts
A	1	Lot for Lot	50	None
B	1	Lot for Lot	10	None
C	2	200	100	None
D	1	300	120	None
E	2	500	0	500, week 1

a) Make MRP records for A, B, C, D, and E. Production quantities and production start dates   for A are: 20 in week 2, 50 in week 4, 30 in week 6, 40 in week 7, 50 in week 9, and 40 in week 11. Use the below MRP record:

Week	
Gross Requirement	
Scheduled receipts	
Projected Available	
Net requirements	
Planned order release	