UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, April/May 2018

Course: IPEG 342-Materials and operations management　　　　**Semester: VI**
Program: B.Tech.(Production and industrial Engg.)
Time: 03 hrs.　　　　　　　　　　　　　　　　　　　　**Max. Marks: 100**

Instructions:

	SECTION A		
S. No.		Marks	CO
Q 1	Discuss the need of materials planning in terms of micro and macro factors.	4	CO1
Q 2	List out various elements of stores management?	4	CO3
Q 3	Write short notes on Traffic management.	4	CO2
Q 4	Shriram Enterprises manufactures a special product "Zed." The following particulars were collected for the current year. Monthly demand of Zed, 1000 units Cost of placing an order, Rs 100 Annual carrying cost per unit, Rs 15 Normal usage, 50 units per week Maximum usage, 75 units per week Minimum usage, 25 units per week Reorder period, 4 to 6 weeks Compute from the above: (a) Reorder quantity, (b) Reorder level, (c) Minimum level, (d) Maximum level, (e) Average stock level.	4	CO5
Q 5	What are the factors affecting Capacity Planning?	4	CO4

	SECTION B		
Q 6	Write short notes on JIT manufacturing, KAIZEN, POKA-YOKE and Lean manufacturing. **OR** An umbrella manufacturing company has a demand forecast s aggregate plan given below.	10	CO4

MONTH	DEMAND	MONTH	DEMAND
January	1200	July	900
February	1000	August	700

March	800	September	1700
April	800	October	1800
May	1400	November	1500
June	1500	December	1600

When the Beginning inventory is 100 units, Stock out cost is Rs.50/unit, holding cost is Rs.10/unit, Sub contracting is Rs.40/unit (Extra) to the maximum of 500 units/ month and Overtime maximum 200 units/month is Rs.10/unit (Extra). Find the optimized solution for the aggregate plan model, when the normal production is 1200units/month with cost of Rs.100/unit.

Q 7	Allocate production capacity to meet demand at a minimum cost. No initial or ending inventory.(Transportation Problem)		**10**	**CO5**

Period	Regular Time	Overtime	Subcontract	Demand Forecast
1	235	20	12	255
2	255	24	15	294
3	290	26	15	321
4	300	24	17	301

Initial Inventory	0 units
Regular-time cost/unit	$985
Overtime cost/unit	$1310
Subcontract cost/unit	$1500
Carrying cost/unit-month	$100

Q 8	Use the sales Forecasting data given below to determine: (a) the least squares trend line, and (b) the predicted value for 2008 sales.		**10**	**CO3**

Year	Time Period (X)	Sales (Units) (Y)
2001	1	100
2002	2	110
2003	3	122

2004	4	130
2005	5	139
2006	6	152
2007	7	164

Q 9	Solve by ABC Analysis.	10	CO3

ABC Analysis		
Stock Number	Annual $ Volume	Percent of Annual $ Volume
J24	12,500	46.2
R26	9,000	33.3
L02	3,200	11.8
M12	1,550	5.8
P33	620	2.3
T72	65	0.2
S67	53	0.2
Q47	32	0.1
V20	30	0.1
		100.0

What are the appropriate ABC groups of inventory items?

SECTION-C

Q 10	1. A vacuum cleaner manufacturer tries to "plan ahead" with MPS in order to effectively address the seasonal variation appearing in the annual demand of its products. A planning horizon of 12 months is used. The demand forecast for the next 12 months are as follows:	20	CO3

MONTH	DEMAND

Jan.	1,800
Febr.	1,500
March	1,100
April	900
May	1,100
June	0
July	1400
August	1500
September	900
October	700
November	0
December	1800

Frame a MPS, When the Beginning inventory is 100 units, Stock out cost is Rs.50/unit, holding cost is Rs.10/unit, ordering cost is Rs.20/order. Find the optimized solution for the aggregate plan model, when the normal production is 1000units/month. Find the optimum cost using (a) Chase demand method (b) Level demand (c) EOQ method- with production on NO demand (d) EOQ method- NO production on NO demand.

Q 11	**(a)Power's Ladder Manufacturing has an aggregate planning proposal**		
	Backorder (shortage) cost per ladder -$10 per month	**10**	**CO4**
	Inventory carrying cost- $3 per month		
	Present work force- 700 ladders/ month		
	Cost is $ 70 per ladder at 700/mo.		
	Cost is $75 for each ladder OVER 700/mo.		
	If less than 700 ladders/mo. Cost is $82 per ladder		

Month	Expected	Production days	Month	Expected	Production days	
January	500	22	July	900	21	
February	600	18	August	900	21	
March	600	21	September	800	20	20
April	700	21	October	700	22	
May	700	22	November	600	20	20
June	800	20	December	600	18	18

Find total cost by Graphical and Charting Method.

(b) Group the parts and machines by **Rank Order Clustering method.**

Machine	part 1	2	3	4	5	6	7	8
A	-	1	-	-	1	-	-	1
B	1	-	1	1	-	1	1	-
C	-	1	1	1	1	-	1	1
D	1	-	-	1	-	1	1	-
E	-	-	-	-	1	1	-	1

10

CO4

OR

Explain with example, the types of Group technology Layout and Group clustering methods.

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CO5