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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: Operations Management   **Semester: I**
Programme: MBA (Oil and Gas)   **Code: LSCM 7001**
Time: 03 hrs.   **Max. Marks: 100**

SECTION A

Attempt all questions   (CO 1)
Select the most appropriate option
Each question carries 2 marks

1. The center of gravity method to determine facility location considers a. Only the distance traveled b. Only the quantity transported c. Both distance and quantity transported d. None of above	**2. The task time for 4 tasks in a production line is 10, 15, 12 and 11 respectively (in minutes). If a day comprises of 8 hours, the maximum production is** a. 40 b. 35 c. 38 d. 32
3. The movement in median model of selection of location is along a. Diagonal path b. Longest path c. Rectilinear path d. None of these	**4. A method for studying the work activities by randomly observing whether an operator is working or idle is called** a. Benchmarking b. Predetermined time and motion standards c. Work sampling d. Process flow charting
5. Scheduling technique for orders on the basis of as soon as possible is a. Backward scheduling b. Forward scheduling c. Both of these d. None of these	**6. Which of the following in aggregate planning is not a decision option for modifying capacity** a. Hiring workers b. Overtime c. Subcontracting d. Price discount
7. The breakeven quantities of two locations A and B are 241 and 278 respectively a. Location A shall result in higher annual profit b. Location B shall result in higher annual profit c. Annual profit at both locations will be same d. Cannot be ascertained	**8. This is a strategic decision** a. Inventory level b. Requirement of labour c. Level of automation d. All of above

9. A plant is designed to produce 100 units in 10 hours. Due to machine breakdown, the plant stopped for 2 hours and produced 80 units. Each unit of product needs 2 KG of raw material. The material used in production was 160 KG.
 	
   a. Plant efficiency has increased and material productivity has reduced
   b. Plant material productivity has increased and efficiency has reduced
   c. Plant efficiency has reduced and material productivity has reduced
   d. Plant efficiency has reduced and material productivity has remained same
	10. Which of the following production processes is most flexible?
	
	   a. Job shop
	   b. Batch production
	   c. Mass production
	   d. All are equally flexible

SECTION B

Attempt any 4 questions
Each question carries 5 marks

1   Explain the concept of value added process with the help of suitable examples.   **(CO 1)**

2   An inventory item in the store has an average daily demand of 20 units. Ordering cost is Rs 100 per order and inventory-holding cost is 10% of the unit cost. If the company works for 300 days in a year and one unit of item costs Rs 50, determine the economic order quantity.
If the standard deviation of daily demand is 3 units and the lead-time is 4 days, calculate the reorder point and safety stock at 95% service level. (The value of Z at 95% service level is 1.645)   **(CO 2)**

3   What are the pure aggregate planning strategies? Which strategy you will adopt if the cost of inventory holding is very high   **(CO 1)**

4   **(CO 3)**

Beginning inventory 150 units Lead time 1 week Order policy Minimum 300 units	WEEK					
	1	2	3	4	5	6
Demand forecast	125	100	175	200	75	125
Booked orders	130	80	150	210	-	-
On hand inventory						
MPS Quantity						
MPS start						

   a. Complete the MPS

b. What is the beginning inventory for the next MPS?

5   A job shop has 6 pending job, which need to be scheduled.   (CO 3)

Job	Processing time (Days)	Due date
A	8	11
B	3	14
C	11	45
D	20	32
E	9	15
F	15	50

Two sequences are under consideration Shortest processing time and Earliest due date. Which sequence will you recommend if the criteria is to minimize number of late jobs?

6   Explain the use of Kanban production control system as a tool for JIT.   (CO 2)

SECTION-C

Attempt any 3 questions
Each question carries 10 marks

1   Five orders are pending for processing through processes of polishing and finishing. The time required (in hours) on both processes is as below.   (CO 3)

Process	Jobs				
	A	B	C	D	E
Polishing	3	5	9	7	4
Finishing	2	6	1	8	11

Use Johnson's rule to determine the sequence of processing of orders. What is the total time required for completion of all jobs? What is the idle time% on both processes?

2   The director of the Riley County, Kansas, library system would like to forecast evening patron usage for next week. Below are the data for the past 4 weeks: (CO 4)

	Mon	Tue	Wed	Thu	Fri	Sat
Week 1	210	178	250	215	160	180
Week 2	215	180	250	213	165	185
Week 3	220	176	260	220	175	190
Week 4	225	178	260	225	176	190

a) Calculate a seasonal index for each day of the week.

b) If the trend equation for this problem is y= 201.74 + .18x, what is the forecast for each day of week 5? Round your forecast to the nearest whole number.

3 Explain the basic types of production systems with suitable examples.   **(CO 1)**

4 The data in the following table represent time-study observations for an assembly process. Based on these observations, find the standard time for the process. Assume a 10% allowance factor on normal time. **(CO 3)**

Observations (minutes)

ELEMENT	PERFORMANCE RATING (%)	1	2	3	4	5
1	100	1.5	1.6	1.4	1.1	1.5
2	90	2.3	2.5	2.1	2.2	2.4
3	120	1.7	1.9	1.9	1.4	1.6
4	100	3.5	3.6	3.6	3.6	3.2

5 Explain the QR and Periodic types of inventory control systems. Explain the application of the systems for different categories of inventory items.   **(CO 1)**

SECTION-D (Maximum Marks 30)   (CO 5)

Auto Parts, Inc. is a distributor of automotive replacement parts. With no manufacturing capability, all the products, it sells, are purchased, assembled and repackaged. Auto Parts, Inc. does have extensive inventory and assembly facilities. Among its products are private-label carburetor and ignition kits. The company has been experiencing difficulties for the last 2 years. First, profits have fallen considerably. Second, customer-service levels have declined, with late deliveries now exceeding 25% of orders. Third, customer returns have been rising at a rate of 3% per month.

Phil Houghton, vice president of sales, claims that most of the problem lies with the assembly department. He says that although Auto Parts, Inc., has accurate BOM indicating what goes into each product, it is not producing the proper mix of the product. He also believes it has poor quality control, its productivity has fallen, and as a result, its costs are too high.

Treasurer Dick Houser believes that problems are due to investment in the wrong inventories. He thinks that marketing has too many options and products. Dick also thinks that purchasing department buyers have been hedging their inventories and requirements with excess purchasing commitments.

Assembly manager John Burnham says, "The symptom is that we have a lot of parts in inventory, but no place to assemble them in the production schedule. When we have the right part," he adds, "it is not very good, but we use it anyway to meet the schedule."

John Tolbert, manager of purchasing, has taken the stance that purchasing has not let Auto Parts, Inc., down. He has stuck by his old suppliers, used historical data to determine requirements, maintained what he views as excellent prices from

suppliers, and evaluated new sources of supply with a view toward lowering cost. Where possible, John reacted to the increased pressure for profitability by emphasizing low cost and early delivery.

As president of Auto Parts, Inc., you must get the firm back on a course toward improved profitability.

DISCUSSION QUESTIONS

1. Identify both the symptoms and problems at Auto Parts, Inc.

2. What specific changes would you implement?