

(c) Continuous flow system vs Intermittent flow system.

(d) Factors affecting the location decision.

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6148

J

Unique Paper Code : 2922063603

Name of the Paper : Operations Management

Name of the Course : **BMS NEP : UGCF 2022**

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. There are **6** questions in all. Each question carries **18** marks.
3. Attempt any **5** questions.
4. Attempt **all** parts of a question together and show your workings clearly as a part of the solution.
5. Use of simple calculator is allowed the critical essays prescribed to assist access to the graphic narratives.

1. (a) AeroCon Ltd. keeps the inventory in special containers to avoid damage. Each container occupies 12 square feet of available space in the store. The storage space available is limited to 6,600 square feet. The annual demand for the inventory item is 9,600 containers, priced at Rs. 18 per container. The ordering cost is estimated at Rs.75 per order and the annual carrying costs per unit amount to 25% of the inventory value. Find the optimum order quantity, its associated cost and number of orders to be placed during the year. Would you recommend the company to increase the storage space? If so, how much should be the increase? (12)

- (b) Which type of layout would you suggest for an automobile manufacturing concern? Justify your choice. (6)

- (b) Six jobs are to be completed and only one machine is available for this purpose. Detailed information for each job is as follows : (6)

Job	I	II	III	IV	V	VI
Processing Time (in days)	4	12	2	11	10	3
Due Date	20	30	15	16	18	5

- (i) Use SPT and EDD to schedule the jobs and compute the average flow time, average number of jobs in the system for each schedule.
- (ii) Identify which rule performs the best.

6. Write short notes on any 3 of the following :

(3×6)

- (a) Costs associated with inventory.
- (b) Working of a dual-card kanban system.

5. (a) The operations manager at a car manufacturing facility is considering three possible courses of action to decide about the expansion of production due to rise in demand. The alternatives include P1: setting up of a new plant, P2: subcontracting or P3: initiation of overtime production. However, the decision depends on whether the future demand turns out to be high, moderate or low. The anticipated profits in each of the demand situation is given below : (12)

Expected Demand	Probability	P1	P2	P3
High	0.40	(-150)	100	10
Medium	0.50	20	60	50
Low	0.10	200	(-20)	50

Draw a decision tree and find the optimal decision.

2. (a) The Model J Wagon is to be assembled on a conveyor belt. 504 wagons are required per day. Production time per day is 420 minutes, and the assembly details are as follows : (12)

Task	A	B	C	D	E	F	G	H	I	J	K
Task Time (in seconds)	45	11	9	50	15	12	12	12	12	8	9
Precedence	-	A	B	-	D	C	C	E	E	F, G, H, I	J

- Draw the schematic diagram.
 - What is the required cycle time and theoretical minimum number of workstations to meet the forecasted demand?
 - Balance the line and assign tasks to workstations following the LOT rule.
 - What is the efficiency of the line?
- (b) What is lean management? How does it help organizations to create customer focused production line? (6)

3. (a) The production figures of a component at a factory for the first six months of a year as shown in the table below : (12)

Month	January	February	March	April	May	June
Output (in units)	162	158	138	190	182	177

- (i) Use 2-period WMA with weights of 0.6 and 0.4 (with the most recent observation weighted higher), calculate the forecast for March through July.
- (ii) Using single exponential smoothing method, with $\alpha = 0.3$, calculate the forecast for July through September, given that the forecast for March is 130 units.
- (iii) Calculate MAD for each forecast method. Which forecast is more accurate?
- (b) Explain the salient features of capacity planning in varying time horizons for planning capacity in an organization. (6)

4. (a) A book binder three processes namely, printing, binding followed by finishing to print five different books. The time required to perform the printing, binding and finishing operations for each book (in minutes) is as follows : (12)

Book	1	2	3	4	5
Printing	40	90	80	60	50
Binding	50	60	20	30	40
Finishing	80	100	60	70	100

- What is the optimal order in which the books should be processed to minimize the total time? Also, find the minimum total elapsed time.
- (b) 'Operations Management ensures the conversion of inputs into outputs, to provide the desired utilities to the customer while meeting the organizational objectives of effectiveness and efficiency.' Discuss. (6)