Enrolment No.: .....

IIHMR UNIVERSITY

School of Development Studies

MBA Development Management
Batch-2 (2022-2024)
Second Year, Term 4 End Term Examination, September 2023

DM-707 Production and Operation Management

Time - 3 Hour **Maximum Marks: 50 (Minimum Marks: 20)**

Instructions to students:

- **This question paper contains 4 printed page/s.**
- **Don't write anything on the Question Paper except your Enrolment No.**

Part A

(Maximum Marks: 5)

Q1. Answer the following by choosing the most appropriate option: (0.5 x 10 = 5 marks)

(i). Production & Operations Management approach is _____ .

a) multi-disciplinary
b) subjective
c) intuitive
d) collect essential data

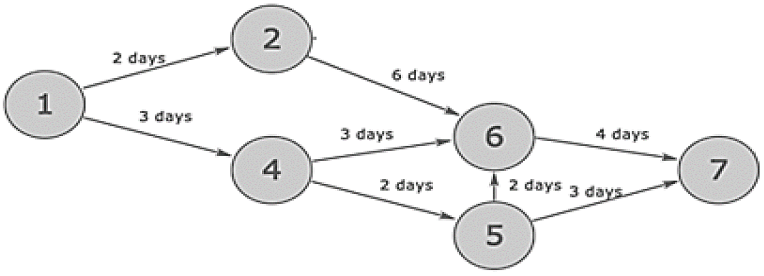
(ii). Forecasting in production and operations could be done by

a) Exponential Smoothing
b) Regression Analysis
c) Naïve
d) All of the above

(iii). Float or slack of an activity is

a) The amount with which a non-critical activity could be rescheduled without increasing the project duration
b) The amount with which a critical activity could be rescheduled without increasing the project duration
c) The amount with which a critical activity could be rescheduled with increasing the project duration
d) None of the above

(iv). The project duration (length of critical path) in the network diagram below is:



a) 10 days
b) 11 days
c) 12 days
d) 14 days

(v). A development organization want to locate their supply warehouse in a community or region that will minimize the distribution distance based on the volume of transactions from this warehouse to each hospital or clinic. The location method useful will be

a) cost - profit - volume method
b) center - of - gravity method
c) factor rating method
d) None of the above

(vi). Consider the following linear programming in answering the question. The number of decision variables are:

Maximize

$$Z = 1{,}600\ x_1 + 3{,}000\ x_2$$

Subject to:

$$40\ x_1 + 25\ x_2 \leq 80{,}000 \text{ (constraint1)}$$
$$20\ x_1 + 30\ x_2 \leq 60{,}000 \text{ (constraint2)}$$
$$x_1\ ,\ x_2 \geq 0 \text{ (non-negativity constrains)}$$

a) 2
b) 3
c) 4
d) None of the above

(vii). _____ or _____ are used to "balance" an assignment or transportation problem

a) Destinations; sources
b) Units supplied; units demanded
c) Dummy rows; dummy columns
d) Large cost coefficients; small cost coefficients

(viii). Holding or carrying cost in inventory management is

a) time and effort spent to prepare invoices, inspect goods upon arrival for quality and quantity, and move goods to temporary storage, etc.
b) interest on the money borrowed to buy the items, insurance, warehousing, security, obsolescence, outdated medications, deterioration, spoilage, pilferage, theft, and depreciation.
c) opportunity cost of losing a customer or goodwill, and the risk of lawsuits.
d) None of the above

(ix). DPMO stands for _____

e) Defects per meter opportunities
f) Defects per million opportunities
g) Defects per month of opportunities
h) Defects per millimeter of opportunities

(x). One physician on duty full time works in a hospital emergency room. Previous experience has shown that emergency patients arrive according to a Poisson distribution with an average rate of four per hour. The physician can provide emergency treatment for approximately six patients per hour. The system utilization is:

a) 0.5
b) 0.66
c) 0.8
d) 0.9

Part B

(Maximum Marks: 15)

Answer any three questions of the following, in brief. Each question carries equal marks.
(3 x 5 = 15 marks)

Q1. What do understand by Production & Operations Management. Explain the five Ps of production management.

Q2. Explain the EOQ model in inventory management. A hospital uses 12,000 disposable syringes a year at a cost of Rs.5 each. Order costs have been estimated to be Rs. 500 per order and inventory holding cost is estimated at 20% of the cost of a component per year. What is the EOQ?

Q3. Define quality management. Explain important tools & techniques for quality management and improvement in production and operations management.

Q4. Table below shows the precedence relationships among the activities to complete a development management project.

Activity	Predecessor	Duration (days)
A	–	18
B	A	19
C	A	17
D	B	15
E	C	18
F	D	13
G	E	17
H	F, G	12

Draw the arrow diagram, using the helpful numbering of the activities. Tabulate and analyze the activities early start and latest finish times. Also determine the float for each activity.

Q5. Explain queuing and capacity planning in production and operations management.

Part C

(Maximum Marks: 30)

Answer any three questions of the following questions, in detail. Each question carries equal marks.
(3 x 10 = 30 marks)

Q6. Explain the various location & layout techniques which could applied in locating development facilities.

Q7. Explain the various qualitative and quantitative techniques in forecasting in production and operations management.

Q8. A development Organisation is considering a new computerized information management system. The following information has been gathered regarding the installation and implementation of the system:

	Activity	Description	Immediate Predecessors	Duration (days)
Start	A	Select the computer model	-	6
	B	Design input / output system	A	12
	C	Design monitoring system	A	10
	D	Assemble the computer hardware	B	20
	E	Develop the main programmes	B	11
	F	Develop input/output routines	C	8
	G	Create Database	E	6
	H	Install the system	D,F	3
Finish	I	Test and implement	G,H	6

Construct an activity on arrow network for the project. Identify the paths and path project durations. Determine the critical path and the expected project completion time. Find the ES, LS, EF, LF, and slack time for each activity.

Q9. Explain the structure of Linear Programming model used in resource allocation.
Given the following linear programming formulation:

Maximize $1{,}600\ x_1 + 3{,}000\ x_2$

Subject to: $40\ x_1 + 25\ x_2 \leq 80{,}000$ (constraint1)
$20\ x_1 + 30\ x_2 \leq 60{,}000$ (constraint2)
$x_1 , x_2 \geq 0$ (non-negativity constrains).

Solve the problem graphically. What is the total objective function value?

Q10. A Medical Supply company produces catheters in packs at three productions facilities. The company ships the packs from the production facilities to four warehouses. The packs are distributed directly to hospitals from the warehouses. The table shows the costs per pack to ship to the four warehouses, along with demand and supplying capacity.

Medical Supply

	TO WAREHOUSE			
FROM PLANT	**Seattle**	**New York**	**Phoenix**	**Miami**
Juarez	$19	$7	$3	$21
Seoul	$15	$21	$18	$6
Tel Aviv	$11	$14	$15	$22

Capacity		**Demand**	
Juarez	100	Seattle	150
Seoul	300	New York	100
Tel Aviv	200	Phoenix	200
		Miami	150

As the Production and Operations Manager, find out which plant should supply which warehouse, so that the cost of the shipping is minimized? Use VAM method in finding the initial solution. Also find the minimum total cost.