

LIHMR UNIVERSITY
Institute of Health Management Research
MBA Hospital and Health Management
Batch-20th (2015-2017)
Hospital Management
Operations Management
Term Examination



Time - 3 Hour

MM-70

The question paper contains 4 printed pages.

Instructions

1. The question paper contains 9 Questions. Candidates are required to answer any five (5) questions.
2. All questions carry equal marks.
3. Use of following supporting material is permitted during examination.

GRAPH SHEETS

- Q. 1.** What is operations management? How you can apply in healthcare services production. Explain the various operations management tools and techniques that could be applied in hospitals. [14]

- Q. 2.** What are the factors that should be considered while selecting a location of a hospital? [4]

A medical center would like to establish a satellite clinic to provide medical care for residents living in recently developed suburbs. Four potential sites are under consideration. The data is displayed in the table below:

Factors to be Considered in Establishing a Satellite Clinic				
	Zip Codes of Potential Sites			
Factors	23059	23233	23112	23832
Land	\$ 350,000	\$ 390,000	\$ 245,000	\$ 200,000
Building	\$ 450,000	\$ 450,000	\$ 435,000	\$ 425,000
Operating	\$ 235,000	\$ 240,000	\$ 220,000	\$ 205,000
Population Size	15,683	50,296	38,660	25,775
Elderly	7%	12%	6%	5%
Education	92%	96%	93%	90%
Income	\$73,668	\$67,917	\$63,519	\$61,738
Insured	88.2%	88.6%	88.5%	88.1%

- Q. 3.** Find out the best location on factor rating method. [10]
 What is the need for forecasting in health care operations? Explain in brief the various forecasting approaches that enable the healthcare managers to anticipate the future and plan service delivery. [4]

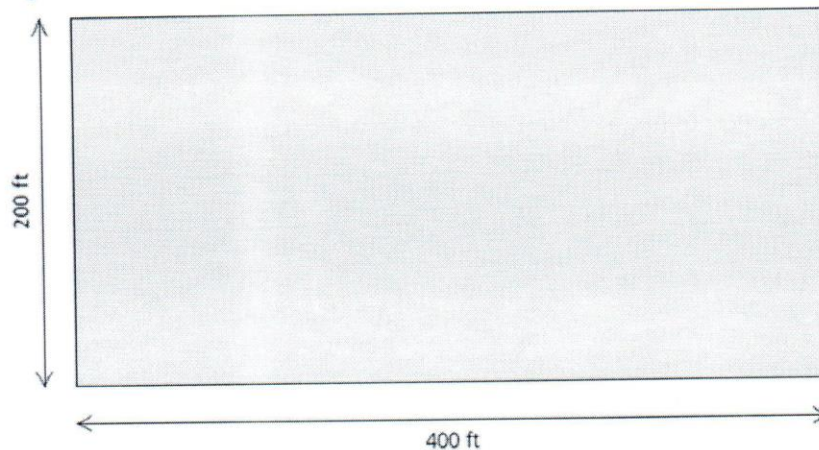
The monthly ambulatory visits in an outpatient clinic are shown in table below:

Months	Visits
July	2160
August	2186
September	2246
October	2251
November	2243
December	2162

- a. Predict visits for January, using the naïve forecast method. [2]
- b. Predict visits for January, using a three - period moving average. [2]

- c. Predict visits for January, using a four - period moving average. [2]
d. Prepare a forecast for January visits, using the simple exponential smoothing method with $\alpha = 0.3$. [2]
e. Calculate MAD and MAPE for naïve, three- period and four- period forecasts. [2]
Which forecast appears more accurate? [2]
Q. 4. Explain the three basic types of layouts viz. Product layout, Process Layout and Fixed position layout. [4]

A long-term care facility will be constructed with total available area of 200 x 400 feet.



Available Space for Layout of Long-Term Care Facility.

The dimensions of each department and the desired relationships among the departments are depicted in Figure below:

Area in feet	Department										
40 * 80	1. Nurse's station										
40 * 40	2. Ambulance entrance										
Remaining space	3. Patient room area										
40 * 80	4. Laundry										
80 * 80	5. Main entrance										
40 * 80	6. Dietary department										

A	absolutely necessary
E	very important
I	important
O	ordinary importance
U	unimportant
X	undesirable

Closeness Rating Chart for Long-Term Care Facility.

Design a functional layout with the given parameters.

[10]



- Q. 5. A hospital is considering a project of launching a new radiation oncology service. The list of necessary activities and their duration, is shown in table below:

Activity Name	Description	Time Weeks)	Predecessor
A	Land acquisition	4	-
B	Hire radiation oncologist	16	-
C	Select contractor & plan	8	A,B
D	Build facility	24	C
E	Acquire equipment	28	C
F	Hire technical staff	4	D,E
G	Setup software	8	D,E
H	Test equipment	4	F,G

Draw the network for the project, determine the critical path and compute the minimum time for launching the new radiation oncology service. Calculate ES, LS, EF, LF, and float for each activity. [14]

- Q. 6. Explain the mathematical structure of linear programming which could be used in resource allocation in hospitals. [4]

A practice would like to allocate their resources optimally between the orthopedic and rheumatology departments. The revenues per case generated by orthopedics and by rheumatology are \$ 2,000 and \$ 1,000, respectively. The average number of visits, utilization of radiology resources per case, and available resources are in Table.

	Orthopedics	Rheumatology	Available resources
Visits	2	3	600 hours MD time
Radiology	4	1	800 procedures

- a. Formulate this as a linear programming problem. [2]
b. Solve the problem graphically. How much total combined revenue can be generated with this solution? [6]
c. For the optimal solution, what should be the percentages of allocation between the two departments? [2]

- Q. 7. Explain the structure of transportation problem as a special class of the linear programming problem. [4]

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.

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

Find the solution for the given problem by VAM method, if the object is to minimize total transportation cost. [10]



- Q. 8. The indirect costs for design and implementation of a new health information system project are Rs. 8,000 per day. The project activities (A through I), their normal durations and compressed durations, and also the direct compression, or crashing, costs are shown in table below.

Activity	Immediate predecessor	Normal time (days)	Compressed time (days)	Direct compression cost (Rs.) per day (in thousands)
A	-	20	19	11
B	A	75	74	8
C	B	42	40	6
D	B	45	44	10
E	B	28	26	7
F	C,D	21	18	20
G	E	40	40	0
H	F,G	20	19	18
I	H	20	19	20

Find the optimal earlier project completion time.

[14]

- Q. 9. Write short notes on any two of the following :

[7 x 2]

- Resource Leveling & Resource Smoothing.
- Assignment problem in hospital operations management.
- EOQ model in hospital supply chain management.
- Statistical Control charts in hospital operations.
- Queuing and capacity planning in Hospitals.

