International Institute of Health Management Research (IIHMR), New Delhi.
POSTGRADUATE DIPLOMA IN MANAGEMENT
(HOSPITAL AND HEALTH)

(Batch 2020-2022)
Operations Management in Hospitals
HOM 716
End TermExamination

Time allowed: 2hrs   **Max. Marks: 70**

Instructions:

1. **Use of calculator is allowed.**
2. **All questions carry equal marks. Attempt any five.**
3. **Any extra attempted question will be marked negatively.**
4. **All answers to be scanned and uploaded.**

1. A college is preparing a trip for 400 students. The company who is providing the transportation has 10 buses of 50 seats each and 8 buses of 40 seats, but only has 9 drivers available. The rental cost for a large bus is Rs. 8000 and Rs 6000 for the small bus. Calculate how many buses of each type should be used for the trip for the least possible cost.

2. Consider the following transportation problem

	D_1	D_2	D_3	D_4	Availability
O_1	5	8	3	6	30
O_2	4	5	7	4	50
O_3	6	2	4	6	20
Requirement	30	40	20	10	

Determine initial basic feasible solution by VAM.

3. Assign four trucks 1, 2, 3 and 4 to vacant spaces A, B, C, D, E and F so that distance travelled is minimized. The matrix below shows the distance.

	1	2	3	4
A	4	7	3	7
B	8	2	5	5
C	4	9	6	9
D	7	5	4	8
E	6	3	5	4
F	6	8	7	3

4. A small project consisting of eight activities has the following characteristics:

Time – Estimates (in weeks)

Activity	Preceding activity	Most optimistic time (a)	Most likely time (m)	Most Pessimestic time (b)
A	None	2	4	12
B	None	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B,C	9	9	9
G	D	3	3.5	7
H	E,F,G	5	5	5

(i) Draw the PERT network for the project.

(ii) Determine the critical path.

(iii) If a 30- week deadline is imposed, what is the probability that the project will be finished within the time limit?

5. The Palam Airport in New Delhi serves light aircraft. It has a single runway and one air traffic controller to land planes. It takes an airplane 12 minutes to land and clear the runway. Planes arrive at the airport at the rate of 4 per hour.

   a. Determine the average number of planes that will stack up waiting to land.

   b. Find the average time a plane must wait in line before it can land.

   c. Calculate the average time it takes a plane to clear the runway once it has notified the airport that it is in the vicinity and want to land.

   d. The FAA has a rule that an air traffic controller can on the average land planes a maximum of 45 minutes out of every hour. There must be 15 minutes of idle time available to relieve the tension. Will this airport have to hire an extra air traffic controller?

6. Find the Nash equilibria of the following strategic game.

   Player 2

	L	R
T	2,2	0,0
B	0,0	1,1

   Player 1

7. Fit a straight line trend equation by the method of least squares and estimate the trend values for 2021.

Year	2013	2014	2015	2016	2017	2018	2019	2020
Value	80	90	92	83	94	99	92	104