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MASTER OF BUSINESS ADMINISTRATION (M.B.A.)
EXAMINATION : DECEMBER - 2023
SEMESTER -IV
Sub: Operations Research   (MBA403)

Date: 23/12/2023   **Total marks: 60**   **Time: 10.00am to 12.30pm**

SECTION – I

Q. 1. **Fill in the blanks.**   **(5)**

1. In Transportation Problem, L.C.M stands for _____
   a) Lowest Cell Method   b) Lowest Common Multiplier
   c) Least Cost Method   d) Least Calculation Method

2. The objective of network analysis is to_____.

   a) minimize total project duration   b) minimize total project cost

   c) minimize production delays,   d) maximize total project duration
   interruption & conflicts

3. In game theory, the outcome or consequence of a strategy is referred to as the
   _____.
   a) reward   b) end-game strategy

   c) penalty   d) payoff

4. Operation research approach is typically based on the use of _____
   a) iconic model   b) mathematical model
   c) descriptive model   d) physical model

5. All simulations involve _____.
   a) A model on a computer   b) An imitation of a system
   c) A visual display   d) The passage of time

Q. 2. **Answer the following. (Any Two)**   **(20)**

1. The main purpose of Operations Research is to provide a rational basis for decisions making in the absence of complete information, because the systems composed of human, machine, and procedures may do not have complete information. Comment on this statement.

2. Explain the steps involved in Hungarian method of solving assignment problem.

3. Define Simulation. Discuss the advantages and disadvantages of simulation.

4. A self-service store employs one cashier at its counter. Nine customers arrive on an average every 5 minutes while the cashier can serve 10 customers in 5 minutes. Assuming Poisson distribution for arrival rate, and exponential distribution for service rate, find –
   a) Average number of customers in the system.
   b) Average number of customers in queue or average queue length.
   c) Average time a customer spends in the system.
   d) Average time a customer waits before being served.
   e) Traffic intensity (utilization factor)

Q. 3. **Write notes on. (Any Two)** **(10)**

1. Write down various reasons for replacement of machines and equipment.

2. Transportation problem.

3. Assumptions in game theory

SECTION – II

Q. 4. **Case Study** **(15)**

Solve the following assignment problem for **MAXIMIZATION** of sales –

Salesman	Districts				
	A	**B**	**C**	**D**	**E**
P	30	38	40	28	40
Q	40	24	28	21	36
R	41	27	33	30	37
S	22	38	41	36	36
T	29	33	40	35	39

Q. 5. **Answer the following:** **(10)**

a) Define queue. Discuss the structure of a queuing system with suitable diagram.

OR

b) Solve the following transportation problem by using Least cost method -

From	To			
	P	**Q**	**R**	**Supply**
A	2	7	4	**5**
B	3	3	1	**8**
C	5	4	7	**7**
D	1	6	2	**14**
Demand	**7**	**9**	**18**	

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