R09

Code No: 09A70301

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, June/July - 2014

OPERATIONS RESEARCH

(Common to ME, MCT, AME)

Time: 3 Hours **Max. Marks: 75**

Answer any Five Questions

All Questions Carry Equal Marks

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1.a) Define linear programming problem. Give an example.

b) Solve the following LPP using graphical method and verify by Simplex method.

Maximize $Z = 10x_1 + 8x_2$

Subject to $x_1 + 2x_2 \leq 1000$

$x_1 \leq 300$

$x_2 \leq 500$; and $x_1, x_2 \geq 0$.

2.a) What is the difference between transportation problem and assignment problem?

b) A company has three plants A, B, C which supplies to ware houses 1, 2, 3, 4, 5. Monthly plant capacities are 800, 800, 900 units respectively while the monthly requirements at the warehouses are 400, 400, 500, 400, 800 units respectively. The unit transportation costs are shown in table below.

Determine optimum distribution for the company in order to minimize the total transportation cost:

Plants \ Warehouses	1	2	3	4	5
A	5	8	6	6	3
B	4	7	7	6	6
C	8	4	6	6	3

3.a) Explain the Jackson's conditions in working with 'n' jobs X 3 Machine sequencing problems.

b) A truck owner finds from his past records that the maintenance costs per year of a truck, whose purchase price is Rs. 8000, are given below:

Year	1	2	3	4	5	6	7	8
Maintenance cost	1000	1300	170	220	290	380	480	6000
Resale Price (Rs)	4000	200	120	600	500	400	400	400

Determine at what time it is profitable to replace the truck.

4.a) Distinguish the following:

i) Zero-sum game Vs. non-zero-sum game

ii) Fair game Vs. unfair game.

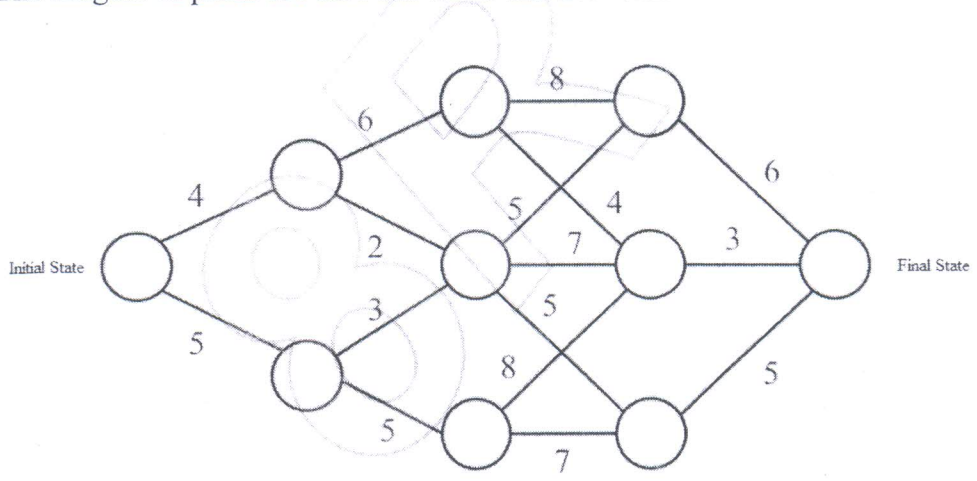
b) A and B play a game in which each has three corns a 5P, a 10P and 20P. Each selects a coin without the knowledge of the others choice. If the sum of the coins is an odd amount, A wins B's coins. If the sum is even B wins A's coins. Find the best strategy for each player and the value of the game

5. A telephone company is planning to install telephone booths in a new air port. It has established the policy that a person should not have to wait more than 10% of the times he tries to use a phone. The demand for use is estimated to be poisson with an average 30 per hour. The average phone call has an exponential distribution with a mean time of 5 min. How many phone booths should be installed?

6. The demand for a purchased item is 1000 units per month, and shortages are allowed. If the unit cost is Rs. 1.50 per unit, the cost of making one purchase is Rs. 600, the holding cost for one unit is Rs. 2 per year, and the cost one shortage is Rs. 10 per year.
Determine:
i) The optimum purchase quantity
ii) The number of orders per year
iii) The optimal total yearly cost.

7.a) State the application of DPP.

b) Find the shortest path from the initial state to the final state as given in Figure. The lengths of paths are also shown in this network.



8. Mr. Raju is an insurance agent and promotes his business by canvassing door to door. From his past experience, he knows that in 50% occasions he doesn't get any response while in other 0.5 probable times when he is allowed to converse,1/3 times he gets no sales, 1/3 times he succeeds to get a policy of rs 50,000 policy and remaining he gets one lakh policy. Simulate the situation so as to determine the chance that he is able to secure a policy and find the expected value of the policies.

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