

Q8) For the following data:

a) Draw the network of the project

b) Find the optimum duration and cost of project

Activity	1-2	1-3	1-4	2-3	2-5	3-5	4-5
Normal time (days)	4	2	5	7	7	2	5
Crash time (days)	3	2	4	5	6	1	4
Normal cost (Rs.)	600	400	750	400	800	500	600
Crash cost (Rs.)	800	400	900	600	1000	650	850

Indirect cost per day for the project is Rs.200

Unit - II

Q9) A farmer has 2000 acres of land on which he can grow corn, wheat or soyabeans. Each acre of corn costs Rs. 2000 for preparation, 7 man-days of work and yields a profit of Rs. 600. An acre of wheat costs Rs. 2400 for preparation, 10 man-days of work and yields a profit of Rs. 800. An acre of soyabeans costs Rs. 1400 to prepare, 8 man-days of work and yields a profit of Rs. 400. If the farmer has Rs. 2,00,000 for preparation and can count on 16000 man days of work, how many acres should be allocated to each crop to maximize profits? Formulate an LP model and solve by using Simplex method.

Q10) Solve the following transportation problem:

Source	Destination				
	1	2	3	4	5
1	40	36	26	38	30
2	38	28	34	34	198
3	36	38	24	28	30
Demand	160	160	200	120	240

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Roll No.

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MBA (Sem. - 3rd)

APPLIED OPERATIONS RESEARCH

SUBJECT CODE : MBA - 301 (2012 Batch)

Paper ID : [C1169]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A consists of **Six** questions carrying **Five** marks each. The Students has to attempt any **Four** questions.
- 2) Section - B consists of **Four** subsections. Each subsection consists of **Two** questions from the each unit each question carrying **Eight** marks. It is **Compulsory** to attempt **One** question from each subsection.
- 3) Section - C consists of **One** case study of **Eight** marks.

Section - A

Q1) What are the steps in decision making analysis?

Q2) An animal feed company must produce 200 kg of a mixture consisting of ingredients A and B daily. A cost Rs. 3 per kg and B Rs. 8 per kg. Not more than 80kg of A can be used and at least 60kg of B must be used. Formulate the LP model to find how much each ingredient should be used if company wants to minimize cost.

Q3) What are the situations which make the replacement of items necessary?

Q4) Briefly explain the important characteristics of queuing theory.

Q5) Draw a diagram showing the physical layout of a queuing system with multi-server multi-channel service facility.

Q6) If probability of finishing a work within X days is 15.87% with expected duration of 15 days and standard deviation of 3 days. Find X.

Section - B

Unit - I

Q7) What techniques are used to solve decision-making problems under uncertainty? Which techniques result in an optimistic decision and which results in a pessimistic decision and why?

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P.T.O.

Section - C

Case Study

Q15) The investment staff of a bank is considering four investment proposals for a client: shares, bonds, real estate and savings certificate. These investments will be held for one year. The past data regarding four proposals is given as:
Shares: There is 25 percent chance that shares will decline by 10 percent, a 30 percent chance that they will remain stable and a 45 percent chance that they will increase in value by 15 percent. Also shares under consideration do not pay any dividends.

Bonds: These bonds stand a 40 percent chance of increase in value by 5 percent and 60 percent chance of remaining stable and they yield 12 percent.
Real Estate: This proposal has a 20 percent chance of increasing 30 percent in value, a 25 percent chance of increasing in 20 percent value, a 40 percent chance of increasing in 10 percent value, a 10 percent chance of remaining stable and a 5 percent chance of losing 5 percent of its value

Savings Certificate: These certificates yield 8.5 percent with certainty.

Construct a decision tree to structure the alternatives available to the investment staff.



Unit - III

Q11) Determine the sequence for the following jobs which minimizes time

		Machines					
Job		M1	M2	M3	M4	M5	M6
A	20	10	9	4	12	27	
B	19	8	11	8	10	21	
C	13	7	10	7	9	17	
D	22	6	5	6	10	14	

Q12) Determine the best strategies for each player and the value of game for the following payoff matrix.

		Player B			
Player A	I	II	III		
	I	-4	6	3	
	II	-3	-3	4	
	III	2	-3	4	

Unit - IV

Q13) a) Explain the fundamental components of a queuing process.

b) State the conditions and limitations of single channel queuing model.

Q14) The initial cost of an item is Rs. 15000 and running costs of different years are :

Year	1	2	3	4	5	6	7
Running cost (Rs.)	2500	3000	4000	5000	6500	8000	10000

What is the replacement policy to be adopted if the capital is worth 10 percent and there is no salvage value?