



AJEENKYA

D Y PATIL UNIVERSITY

End Term Examinations (April/May 2019)

School: SOM-ICRI

Program: MBA in Aviation Management

Course: Operations Research

Course Code: MGT557

Semester: II

Max Marks: 70

Duration (mins): 180 min

Note: 1. Attempt ANY SEVEN full Questions OUT OF EIGHT

2. Figures to the right indicate FULL MARKS.

Q1. A) Explain the uses of operation research in managerial decision making? (5 m)

Q1. B) The investment company is considering three investment proposals for a client. The past data regarding the three proposals are given below:

Long term investment- There is 20 percent chance that real estate increasing 30 percent in value, 25 percent chance of increasing in 20 percent value, a 40 percent chance of increasing in 10 percent value, a 10 percent chances of remaining stable and a 5 percent chance of losing 5 percent of its value. Medium term investment – There is 25 percent chance that shares will decline by 10 percent, a 30 percent change that they will remain stable and a 45 percent chance that they will increase in value by 15 percent.

Short term investment- these proposals in certificates yield 8.5 percent with certainty. Use a decision tree to structure the available alternatives to choose the alternative with the highest expected value. (5 m)

Q 2. A company has four Area sales managers who are to be assigned to four different sales regions. The monthly sales increase estimated for each Area sales managers for different sales regions (in lakhs of rupees) are shown in the following table: (10 m)

Area sales manager	Sales Regions			
	1	2	3	4
A	200	150	170	220
B	160	120	150	140
C	190	195	190	200
D	180	175	160	190

Calculate the optimal assignment and the total maximum sales increase per month.

Q 3. There are five jobs, each of which must go through machines A, B and C in the order ABC.

Processing times (in hours) are given below:

Job	1	2	3	4	5
Machine A	10	11	8	7	6
Machine B	6	4	5	3	2
Machine C	9	5	4	6	8

Determine the optimal processing sequence.

(10 m)

Q 4. Reduce the following game to 2*2 orders, and obtain the optimal strategies for each player and the value of the game:

(10 m)

Player B

		B1	B2	B3	B4
Player A	A1	3	2	4	0
	A2	3	4	2	4
	A3	4	2	4	0
	A4	0	4	0	8

Q5. A manufacturing company has purchased a machinery of Rs. 7,000. Its running costs per year and the resale values are given here:

Year	1	2	3	4	5	6	7	8
Running cost(Rs)	2,000	2,100	2,300	2,600	3,000	3,500	4,100	4,600
Resale value (Rs)	4,000	3,000	2,000	1,600	1,400	700	700	700

At which year is the replacement due?

(10 m)

Q 6. A project has the following characteristics:

(10 m)

Activity	Preceding Activity	Expected Completion time (in weeks)
A	NONE	5
B	A	2
C	A	6
D	B	12
E	D	10
F	D	9
G	D	5
H	B	9
I	C,E	1
J	G	2

K	F,I,J	3
L	K	9
M	H,G	7
N	M	8

- A. Draw a PERT network for this project.
- B. Find the critical path and the project completion time.
- C. Prepare an activity schedule showing the ES, EF, LS, LF and slack for each activity.

Q 7. The rate of arrival of customers at a public telephone follows Poisson distribution, with an average time of ten minutes between one customer and the next. The duration of a phone call is assumed to follow exponential distribution with a mean time of three minutes.

1. What is the probability that a person arriving at the booth will have to wait?
2. What is the average length of the queue?
3. The Mahanagar Telephone Nigam Ltd. will install another booth when it is convinced that the customers would have to wait for at least three minutes for their turn to make a call.

How much should be the flow of customers in order to justify a second booth? (10 m)

Q 8. Solve the following transportation problem for maximizing profit by using:

1. Vogel's approximation method
 2. North West corner method.
- (10 m)

MARKET

	A	B	C	D	SUPPLY
1	12	18	6	25	200
2	8	7	10	18	500
3	14	3	11	20	300
DEMAND	180	320	100	400	1000

WAREHOUSE

*****ALL THE BEST*****