J.K. SHAH®
CLASSES
CAFC→INTER CA→FINAL CA↗

FINAL CA

MAY '19

REVISION NOTES

Costing

Part - VIII

ASSIGNMENT

Q.1. An automobile dealer wishes to put five repairmen to five different jobs. The repairmen have some what different kind of skills and they exhibit different levels of efficiency from one job to another. The dealer has estimated the number of man-hours that would be required for each job-man combination. This is given in the matrix form as follows :

Man	JOB				
	P	Q	R	S	T
A	11	17	8	16	20
B	9	7	12	6	15
C	13	16	15	12	16
D	21	24	17	28	26
E	14	10	12	11	15

Find the optimum assignment that will result in minimum man – hours needed.

Q.2. CIDCO have decided to carry out repairs of five main roads in the city before the onset of the monsoon. Five contractors have submitted quotations as under. It is the policy of CIDCO to award no more than one contract to one contractor. If the objective of the CIDCO is to minimise the total cost, how should they award the contracts? (NQ = No Quotation). How much expenditure should be budgeted?

Contractor	ROADWAYS				
	A1	A2	A3	A4	A5
X1	18	19	14	25	NQ
X2	17	18	13	22	24
X3	19	21	18	20	26
X4	17	22	15	24	27
X5	14	21	10	NQ	25

Q.3. Five salesmen are to be assigned to five districts. Estimates of sales revenue in thousands of rupees for each salesman are given below :

Sales man	DISTRICTS				
	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

Find the assignment pattern that maximizes the sales revenue.

TRANSPORTATION

Q. 1. Solve the following transportation problem for the optimum cost.

		To Destination				Availability
		A	**B**	**C**	**D**	
From	1	1	3	4	2	50
Origin	2	5	3	6	1	70
	3	8	7	1	2	180
Requirement		**50**	**70**	**80**	**100**	

Q.2. Solve the following transportation Problem :

	Godowns						
	1	**2**	**3**	**4**	**5**	**6**	**Stock Available**
1	7	5	7	7	5	3	60
2	9	11	6	11	-	5	20
3	11	10	6	2	2	8	90
4	9	10	9	6	9	12	50
Demand	60	20	40	20	40	40	

There is no route from factory 2 to godown 5.

Q. 3.

Factory	**Destination**			**Supply to be exhausted**
	(1)	**(2)**	**(3)**	
A	5	1	7	10
B	6	4	6	80
C	3	2	5	15
Demand	75	20	50	

Since there is not enough supply, some of the demands at the three destinations may not be satisfied. For the unsatisfied demands, let the penalty cost be rupees 1, 2 and 3 for destinations (1), (2) and (3) respectively.
Find the optimal allocation that minimizes the transportation and penalty cost.

Q.4. The following matrix is a minimization problem for transportation cost. The unit transportation costs are given at the right hand corners of the cells and the Δij values are encircled.

	D_1	D_2	D_3	Supply
F_1	3	4	4	500
F_2	(8) 9	300 6	(2) 7	300
F_3	(0) 4	(2) 6	200 5	200
Demand	300	400	300	1000

Find the optimum solution (s) and the minimum cost.

SIMULATION

Q. 1. A bakery shop keeps stock of a popular brand of cake. Previous experience indicates the daily demand as given here :

Daily demand	0	10	20	30	40	50
Probability	0.01	0.20	0.15	0.50	0.12	0.02

Consider the following sequence of random numbers :
R. No. 48, 78, 19, 51, 56, 77, 15, 14, 68, 09.

Using this sequence, simulate the demand for the next 10 days. Find out the stock situation if the owner of the bakery decides to make 30 cakes every day. Also, estimate the daily average demand for the cakes on the basis of simulated data.

Q.2. Dr. STRONG is a dentist who schedules all her patients for 30 minutes appointments. Some of the patients take more or less than 30 minutes depending on the type of dental work to be done. The following summary shows the various categories of work, their probabilities and the time actually needed to complete the work :

Category	Time required	Probability of category
Filling	45 minutes	0.40
Crown	60 minutes	0.15
Cleaning	15 minutes	0.15
Extraction	45 minutes	0.10
Checkup	15 minutes	0.20

Simulate the dentist's clinic for four hours and determine the average waiting time for the patients as well as the idleness of the doctor. Assume that all the patients show up at the clinic at exactly their scheduled arrival time starting at 8.00 a.m. Use the following random numbers for handling the above problem :

40, 82, 11, 34, 25, 66, 17, 79.

Q.3. A bakery sells a popular brand of bread. Cost price per bread is ₹ 16 and selling price per bread is ₹ 20. Shelf life of the bread is 2 days and if it is not sold within two days, then it has no sale value at the end of second day. Daily demand based on past experience is as under:

Daily Demand	0	20	25	35	40	45
Probability	.01	.15	.30	.40	.10	.04

Consider the following sequence of random numbers :

58, 80, 51, 09, 47, 26, 64, 43, 86, 35

Using the sequence, simulate the demand for the next 10 days and find out the total profit or loss for 10 days assuming 35 breads are purchased every day in the morning and there is an opening stock of 5 breads (purchased the previous day) on the 1st day morning. Assume LIFO basis (Last In First Out basis -where the fresh bread is sold first).