AR17

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I MBA I Semester Regular Examinations, DECEMBER, 2017
QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

Time: 3 Hrs   **Max. Marks: 60**
Answer Five questions
All questions carry EQUAL marks

1   Use Cramer's Rule method to solve the equations   **[12M]**
     x+y+z = 3, 2x+3y+4z=9, x+2y- 4z= -1.

2   a)   Explain the importance Normal distribution and state its   **[6M]**
          properties.
     b)   Eight coins are tossed simultaneously. Show that the   **[6M]**
          probability of getting atleast 6 heads.

                                                             [12M]
3.   Calculate the Karl Pearson's coefficient of correlation

          between expenditure on advertising and sales from the data

          given below.

	1	2	3	4	5	6	7	8	9	10
Adv. Exp ('000)	39	65	62	90	82	75	25	98	36	78
Sales (lakhs)	47	53	58	86	62	68	60	91	51	84

4.   a)   Briefly explain the concept of Regression and its use.   **[6M]**
     b)   Explain the terms Coefficient of Correlation and   **[6M]**
          Regression Coefficients

5.   Consider the LPP by simplex method max z = 3X1+2X2   **[12M]**
          subject to the constrains x1 + x2 ≤ 4, x1- x2 ≤ 2, x1 ≥0,
          x2 ≥ 0

6. Find the optimal solution to the following Transportation **[12M]** Problem.

To

	W1	W2	W3	W4	Supply
F1	19	30	50	10	7
F2	70	30	40	60	9
F3	40	8	70	20	18
Demand	5	8	7	14	34

7. Solve the following 2×2 games without saddle points using **[12M]** mixed strategies.

Player B

$$playerA \begin{bmatrix} 5 & 1 \\ 3 & 4 \end{bmatrix}$$

8. A Small marketing project consists of the job in the table **[12M]** given below. With each job is listed its normal time and a minimum or crash time (in days). The cost in (Rs. per day) of crashing each job is also given.

Job (i-j)	Normal duration (days)	Min / Crash duration (days)	Cost of Crashing (Rs. per days)
(1-2)	9	6	20
(1-3)	8	5	25
(1-4)	15	10	30
(2-4)	5	3	10
(3-4)	10	6	15
(4-5)	2	1	40

Find the critical path of above project and if overhead cost is Rs.60/- per day. find the optimal time in days to complete the project

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AR16

1. Find Median for the following data: **[12M]**

X	0 - 10	10 - 20	20 - 30	30 - 40	40 – 50
f	12	18	10	23	27

2. A brokerage survey reports that 30 per cent of individual investors have used **[12M]** discount broker i.e. one which does not charge the full commission. In a random sample of 9 individuals, what is the probability that (i) Exactly two sampled individuals have used a discount broker? (ii) not more than three have used a discount broker.

3. What is Hypothesis? Explain the process of hypothesis testing.   **[12M]**

4. Calculate the coefficient of correlation by Karl Pearson's method between x **[12M]** and y and interpret its value.

x	100	200	300	400	500
y	30	50	60	80	100

5. A transport company has two types of trucks, Type A and Type B. Type A **[12M]** has a refrigerated capacity of 20 m^3 and a non-refrigerated capacity of 40 m^3 while Type B has a refrigerated capacity of 30 m^3 and a non-refrigerated capacity of 30 m^3. A grocer needs to hire trucks for the transport of 3,000 m^3 of refrigerated stock and 4,000 m^3 of non-refrigerated stock. The cost per kilometer of a Type A is Rs. 30 and Rs. 40 for Type B. How many trucks of each type should the grocer rent to achieve the minimum total cost?

6.   Solve the following transportation problem: **[12M]**

	P	Q	R	Supply
A	25	31	28	200
B	15	21	23	200
C	17	19	20	300
Demand	150	200	350	700

7.   Solve the given pay off matrix and find value of the game.   **[12M]**

	P	Q	R
A	10	20	30
B	15	10	25
C	10	10	20

8.   **CASE STUDY:**   **[12M]**

The following are the fourteen activities of construction along with their immediate predecessors are shown in the table below:

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Predecessor	-	A	B	C	C	E	D	E,G	C	F,I	J	J	H	K,L
Time(weeks)	2	4	10	6	4	5	7	9	7	8	4	5	2	6

    (i) Construct network diagram.
    (ii) Identify the critical path.

AR13 $\boxed{\textbf{SET-02}}$

Subject Code: 13MBA1006
ADITYA INSTITUTE OF TECHNLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I MBA I Semester Supplementary Examinations, December-2017
QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS

Time: 3 hours **Max Marks: 60**

Answer any five questions
All questions carry equal marks.

1. Solve the following LPP by graphical method
    Maximize $Z = 3 x_1 + 5 x_2$
    Subject to constraints $x_1 + x_2 \leq 2000$,
    $\quad\quad\quad\quad x_2 \leq 600$,
    $\quad\quad\quad\quad x_1 + x_2 \leq 1500$,
    $\quad\quad\quad\quad x_1, x_2 \geq 0$

2. Solve the following L.P.P by Simplex Method.
    Minimize $Z = x_1 - 3 x_2 + 2 x_3$
    Subject to Constrains $3 x_1 - x_2 + 3 x3 \leq 7$
    $\quad\quad\quad\quad -2 x_1 + 4 x_2 \leq 12$
    $\quad\quad\quad\quad -4 x1 + 3 x2 + 8 x3 \leq 10$

3. Find Initial Basic Feasible   Solution LOWEST-COST Method

Store

		A	B	C	a_i
	I	10	9	8	8
	II	10	7	10	7
Factory	**III**	11	9	7	9
	IV	12	14	10	4
	b_j	10	10	8	28

4. In a Textile Sales company sales man are A,B,C,D are available to handle the four country's W,X,Y,Z each Sales man handle any country find the time.

Sales Mans

		A	B	C	D
	W	41	72	39	52
	X	22	29	49	65
Country's	**Y**	27	39	60	51
	Z	45	50	48	52

5. Explain the following
    a) t- distribution Properties
    b) Chi square test properties and applications
    c) Additive property of Chi square test

6. The following data gives the figures of production of rice of three varieties A,B,C of rice shown in 12 plots

A	14	13	16	17
B	15	18	12	19
C	20	17	11	8

Is their any significance difference between the varieties.

7. Distinguish between Correlation Analysis and Regression Analysis?

8. As a project manager of quick construction company you are involved in drawing a PERT network for laying the foundation of a new art museum. The relevant information for all the activities of this project is given in the following table.
(Time estimate in weeks)

Activity	Optimistic	Most likely	Pessimistic	Immediate predecessor
A	2	3	4	
B	4	5	6	A
C	3	5	7	A
D	2	4	6	A
E	1	2	3	C,D
F	1	3	5	B,E

   a) Construct the PERT network for the project
   b) Determine the critical path and expected duration, variance of the project.
   c) Find the due date of completing the project so that there is 95% chance of completion.

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