AR19

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I MBA I Semester Regular Examinations, December-2019

QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

Time: 3 Hrs   **Max. Marks: 60**

Answer any Five questions
All questions carry EQUAL marks
Question No. 8 is Compulsory

1.	There are two identical boxes containing respectively 4 white and 3 red and 3 white and 7 red balls. A box is chosen at random and a ball is drawn from it. If the ball is white, what is the probability that it is from the i) first box and ii) second box using Baye's theorem.	12M
2.	The mean of a Normal distribution is 50, 5% of the values are greater than 60. Find the standard deviation of the distribution. (Given: the area under standard normal curve between $z = 0$ and $z = 1.64$ is 0.45)	12M

3. a) What is Poission Distribution? Write the conditions of Poison distribution using Binomial distribution.   6M

    b) Define Correlation and Regression and write its properties.   6M

4. Solve the following LPP using simplex method.   12M

Max Z= $16x_1 + 17x_2 + 10x_3$
   S.T.
$x_1 + x_2 + 4x_3 \le 2000$,
$2x_1 + x_2 + x_3 \le 3600$
$x_1 + 2x_2 + 2x_3 \le 2400$,
$x_1 \le 30$
$x_1, x_2, x_3 \ge 0$

5. Find the optimal solution to the following Transportation Problem.   12M

To

	W1	W2	W3	W4	Supply
F1	4	8	8	0	76
F2	16	24	16	0	82
F3	8	16	24	0	77
Demand	72	102	41	20	

6.   Solve the following game graphically.   12M

B

	I	II	III	IV
I	2	2	3	-1
II	4	3	2	6

7.   In trying to evaluate the effectiveness in its advertising campaign, a firm   12M
        complied the following information.

Adv. Exp(x) ('000) Rs.	12	15	15	23	24	38	42	48
Sales (y) (lakhs) Rs.	5.0	5.6	5.8	7.0	7.2	8.8	9.2	9.5

Calculate the regression equation of sales on advertisement expenditure .
Estimate the probable sales when advertisement budget is Rs.60,000/-

8.   **CASE STUDY:**   12M

A Small marketing project consists of the job in the table given below. With
each job is listed its normal time.

Job (i-j)	Normal duration (days)
(1-2)	9
(1-3)	8
(1-4)	15
(2-4)	5
(3-4)	10
(4-5)	2

Find the critical path of above project and also find the optimal time in days to
complete the project.

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Code: 17MBA1006   **SET-I**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I MBA I Semester Supplementary Examinations, December-2019
QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

Time: 3 Hrs   **Max. Marks: 60**

Answer any Five questions
All questions carry EQUAL marks
Question No. 8 is Compulsory

1.   **[6M]**

    a)   Find the Determinant of A where A= $A = \begin{bmatrix} -7 & 5 & 8 \\ 6 & 2 & -6 \\ 3 & -8 & 7 \end{bmatrix}$

    b)   Find the quadratic function of the form: $y = ax^2 + bx + c$ that fits to the data points (-1, 8), (0, 6) and (1, 12). Use it to determine the value of y when x = 4.   **[6M]**

2. a)   Define   **[6M]**
                a.   Joint Probability
                b.   Marginal probability
                c.   Conditional Probability

    b)   If a coin is tossed for 6 times then find the probability for (i) exactly three heads, (ii) All heads and (iii) Atleast two heads using binomial distribution.   **[6M]**

3.   A competition in musical test was conducted for 10 individuals and were ranked by 3 different judges A, B and C as follows   **[12M]**

Ranks by A	1	6	5	10	3	2	4	9	7	8
Ranks by B	3	5	8	4	7	10	2	1	6	9
Ranks by C	6	4	9	8	1	2	3	1	5	7

4.   A firm producing two products A and B. Each unit of A requires 2 kgs of Raw Material and 4 Labour hours. Similarly each unit of B requires 3 kgs of Raw Material and 3 Labour hours. Every week, the firm has an availability of 60 kgs of raw material and 96 labour hours. One unit of Product A earns a profit of Rs 40 and One unit of Product B earns a profit of Rs 35. Then develop a LP Model which maximizes the profit and also solve it using graphical method.   **[12M]**

5. a)   Explain   **[6M]**
                a.   Two-person zero sum game
                b.   Pure strategy
                c.   Mixed strategy

    b)   Solve the following game whose payoff matrix is   **[6M]**

		Player B		
		B1	B2	B3
	A1	9	8	-7
Player A	A2	3	-6	4
	A3	6	7	-7

6.	A salesman has the following record of sales during three months for three products A, **[12M]**
	B and C, which have different rates of commission: x, y, z respectively. Find out the
	rates of commission on products A, B and C using Matrix Inversion Method.

Month	Sales of Products			Total commission
	A	B	C	drawn (in Rs.)
January	90	100	20	800
February	130	50	40	900
March	60	100	30	850

7.	Solve the following LPP using Simplex method	**[12M]**

$$Max\ Z=5X_1+10X_2+8X_3$$
$$STC\ \ 3X_1+5X_2+2X_3\le 60$$
$$4X_1+4X_2+4X_3\le 72$$
$$2X_1+4X_2+5X_3\le 100$$
$$NNR\ X_1,\ X_2,\ X_3\ge 0$$

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

	For the following Project

Activity	1-2	1-3	2-3	2-4	3-4	3-5
Duration (In Hrs)	100	30	20	15	10	60

	then	a) Draw the Network Diagram
		b) Obtain the critical path and project completion time.