SILIGURI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF BUSINESS ADMINISTRATION (MBA)

MBA (N) 1st SEM'19, 2nd INTERNAL TEST (Continuous Evaluation IV)

Paper Name: **QUANTITATIVE TECHNIQUES** Code: **MB 106**
Full Marks: **30** Time: **1 Hour**

GROUP A (Operations Research)

Q1. Answer all Questions (CO1) (3 x 1 = 3)

(i) A transportation problem having *m x n* structure will result a non-degenerate solution if total number of independent allocations is

(a) m + n – 1 (b) mn (c) m - n + 1 (d) m + n + 1

(ii) In Simplex method …….. Variables are added in case of 'equality (=) type constraint'

(a) Slack (b) Artificial (c) Surplus (d) None of these

(iii) Every LPP is associated with another LPP is called ----------

(a) Primal (b) Dual (c) Non linear (d) None of these

Q2. Answer any *two* from the following (CO3) (3 x 2 = 6)

(a) Find the Optimal Assignment schedule of following machine & job allocation problem

	J1	J2	J3	J4	J5
M1	9	11	15	10	11
M2	12	9	--	10	9
M3	--	11	14	11	7
M4	14	8	12	7	8

(b) Find the Dual of the following LPP:

Maximize $Z = 4x_1 + x_2 + 7x_3$

Subject to Constraints: $x_1 + 7x_2 - 3x_3 \leq 4$;

$5x_1 - x_2 + x_3 \geq 12$;

$x_1 + x_2 + x_3 = 10$

Where all the $x_1, x_2, x_3 \geq 0$

(c) Apply the Principal of Dominance to solve the following game whose pay-offs are given below:-

æ47

Q3. Compulsory: Find the Initial Basic Feasible Solution by VAM of the following Transportation Problem. (CO3) (6)

	W1	W2	W3	W4	W4	***Supply***
F1	55	30	40	50	50	40
F2	35	30	100	45	60	20
F3	40	60	95	35	30	40
Demand	25	10	20	30	15	

GROUP B (Statistics)

Q4. Answer All (CO1) (2 x 1 = 2)

(i). Consider a random experiment of throwing a die. What is the probability of getting odd face?

(a) 1/6 (b) 2/3 (c) 1/2 (d) 0

(ii). Consider the random experiment of choosing a card. What is the probability of getting queen?

(a) 1/52 (b) 1/13 (c) 2/13 (d) 1

Q5. Answer any *two* from the following (CO3) (3 x 2 = 6)

(i) If X is normally distributed with mean 11 and standard deviation 1.5, then find the probability of x = 1

(ii) Consider the random experiment of tossing a fair coin till a head appears for the first time. Let X is the number of tosses required. Find the distribution of X.

(iii) A system that will either operate or fail in a certain event mission and let p denotes the probability of the successful operation. Eight trails are considered with the result S, F, S, S, S, F, S, S. Assuming independence of the trails find the maximum likelihood estimates of p.

Q6. Compulsory (CO3): The following table gives the ages and blood pressure of 10 women (7)

Age(X)	56	42	36	47	49	42	60	72	63	55
Blood Pressure(Y)	147	125	118	128	145	140	155	160	149	150

Determine the (a) regression line of Y on X (b) regression line of X on Y (c) correlation coefficient between X and Y

And (d) Estimate the blood pressure of a women whose age is 45 years.