Roll No. 200/2/5/-

S-702

January 2018

M. B. A. (International Business) Examination

(New) First Semester

913 : QUANTITATIVE TECHNIQUES AND STATISTICAL METHODS

Time 3 Hours] [Max. Marks 85

Note : Attempt any three questions from Section A and attempt any two questions from Section B. Each question carries equal marks.

Section A

1. Use Big-M (penalty) method to solve the following linear programming problem :

Minimize $(z) = 5x_1 + 3x_2$

Subject to the constraints : $2x_1 + 4x_2 \leq 12$

$$2x_1 + 2x_2 = 10$$

$$5x_1 + 2x_2 \geq 10$$

and $x_1, x_2 \geq 0.$

2. Apply MODI method to obtain optimal solution of transportation problem, using the data given below :

Destination / Source	D_1	D_2	D_3	D_4	Supply
S_1	19	30	50	10	07
S_2	70	30	40	60	09
S_3	40	08	70	20	18
Demand	05	08	07	14	34

3. In the modification of a plant layout of a factory four new machine M_1, M_2, M_3 and M_4 are to be installed in a machine shop. There are five vacant places A, B, C, D and E available. Because of limited space, machine M_2 cannot be placed at C and M_3 cannot be placed at A. The cost of locating a machine at a place (in hundred rupees) is as follows :

Location

		A	B	C	D	E
Machine	M_1	9	11	15	10	11
	M_2	12	9	×	10	9
	M_3	×	11	14	11	7
	M_4	14	8	12	7	8

Find the optimal assignment schedule.

4. Solve the following game using graphical method :

(a)

B's Strategy

A's Strategy	B_1	B_2	B_3	B_4
A_1	8	5	–7	9
A_2	–6	6	4	–2

P. T. O.

(b)

B's Strategy

A's Strategy \ B	B_1	B_2
A_1	–7	6
A_2	7	–4
A_3	–4	–2
A_4	8	–6

5. A project consists of nine activities whose time estimates (in weeks) and other characteristics are given below :

Activity	Preceding Activity	Time Estimates (weeks)		
		Most Optimistic	Most Likely	Most Pessimistic
A	–	2	4	6
B	–	6	6	6
C	–	6	12	24
D	A	2	5	8
E	A	11	14	23
F	B, D	8	10	12
G	B, D	3	6	9
H	C, F	9	15	27
I	E	4	10	16

(a) Show the PERT network for the project.
(b) Identify the critical activities.
(c) What is the expected project completion time and its variance ?
(d) What is the probability of completing the project one week before the expected time ?

Section B

6. Find the correlation coefficient between age and playing habits of the following students :

Age (Years)	:	15	16	17	18	19	20
No. of Students	:	250	200	150	120	100	80
Regular Players	:	200	150	90	48	30	12

Also calculate probable error and point out whether coefficient of correlation is significant.

7. Define Statistical Inference. Explain the significant importance of statistical inference methods in business management.

8. Write short notes on any three of the following :
(a) Measures of Dispersion.
(b) Level of significance and its use in hypothesis testing.
(c) Sampling and its types.
(d) F-test and T-test, its scope in international business.