UNIVERSITY OF NORTH BENGAL

BBA Honours 3rd Semester Examination, 2020

GE3-BBA (304)

QUANTITATIVE TECHNIQUES FOR MANAGEMENT

Full Marks: 60

ASSIGNMENT

The figures in the margin indicate full marks.
All symbols are of usual significance.

Answer any *two* assignments

1. (a) Solve graphically the following LPP: 12+18=30

   Maximize $z = 8x + 5y$

   Subject to the constraints:

   $x \leq 150$,

   $y \leq 250$,

   $2x + y \leq 500$,

   and $(x, y) \geq 0$.

   (b) An oil company requires 12,000, 20,000, and 15,000 barrels of high-grade, medium-grade and low-grade oil respectively. Refinery A produces 100, 300 and 200 barrels per day of high-grade, medium-grade and low-grade oil respectively, while refinery B produces 200, 400 and 100 barrels per day of high-grade, medium-grade and low-grade oil respectively. If refinery A cost Rs. 40,000 per day and refinery B cost Rs.30,000 per day to operate, for how many days should each B run to minimize cost while satisfying requirements? (Solve it using Simplex Method).

2. (a) Solve the following LPP by Big-M Method: 20+10=30

   Minimize $z = x_1 - 3x_2 + 2x_3$

   Subject to the constraints:

   $3x_1 - x_2 + 2x_3 \leq 7$,

   $-2x_1 + 4x_2 \leq 12$,

   $-4x_1 + 3x_2 + 8x_3 \leq 10$,

   and $(x_1, x_2, x_3) \geq 0$.

   (b) Prove that dual of dual is the primal of a Linear Programming Problem.

3. (a) For the following transportation problem obtain the different starting solutions $18+12 = 30$
by adopting the North-West corner method and Vogel's approximation method
and find out which solution is better?

	D_1	D_2	D_3	a_i
O_1	5	1	8	12
O_2	2	4	0	14
O_3	3	6	7	4
b_j	9	10	11	

(b) Obtain an optimal basic feasible solution to the following transportation
problem:

	W_1	W_2	W_3	W_4	
F_1	19	30	50	10	7
F_2	70	30	40	60	9
F_3	40	8	70	20	18
	5	8	7	14	

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