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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T2 EXAMINATIONS, OCTOBER-2019

B.Tech VII Semester (All Branches)

Course Code: 10B1WMA731 MAX. MARKS: 25

Course Name:Optimization Techniques MAX. TIME: 1.5 Hours

Course Credits: 03

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Each question carries equal marks.

Q1.The manager of an oil refinery has to decide upon the optimal mix of two possible blending process of which the inputs and outputs per production run are as follows:

Process	Crude A(Input)	Crude B(Input)	Gasoline X(Output)	Gasoline Y(Output)
1	5	3	5	8
2	4	5	4	4

The maximum amount available of crude A and B are 200 units and 150 units respectively. Market requirements show that at least100 units of gasoline X and 80 units of gasoline y must be produced. The profits per production run from process 1 and 2 are Rs.3 and Rs.4 respectively. Formulate the problem as linear programming problem and solve it using appropriate method other than graphical method. [CO1]

Q2.Find the solution of dual from the solution of the primal problem [CO2]

$Max\ Z = 2x_1 + x_2$

s/t $x_1 + 2x_2 \leq 10\ , x_1 + x_2 \leq 6\ , x_1 - x_2 \leq 2\ and\ x_1 - 2x_2 \leq 1$

$x_1, x_2 \geq 0$

Q3.Solve the LPP using Dual simplex method. [CO2]

$Min\ Z = x_1 + 2x_2 + 3x_3$

s/t $x_1 - x_2 + x_3 \geq 4\ , x_1 + x_2 + 2x_3 \leq 8\ and\ x_2 - x_3 \geq 2$

$x_1, x_2, x_3 \geq 0$

Q4.Write mathematical form of assignment problem and solve the assignment problem [CO3]

Jobs/Persons	1	2	3	4	5	6
A	12	10	15	22	18	8
B	10	18	25	15	16	12
C	11	10	3	8	5	9
D	6	14	10	13	13	12
E	8	12	11	7	13	10

Q5.Find the basic feasible solution of the transportation problem using North West corner rule and Vogel's approximation method. [CO4]

Origin/Destinations	1	2	3	4	Availability
1	2	3	11	7	6
2	1	0	6	1	1
3	5	8	15	9	10
Requirements	7	5	3	2	