BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO/2022)

CLASS: MCA **SEMESTER : V**
BRANCH: MCA **SESSION : MO/2022**

SUBJECT: CA605 OPTIMIZATION TECHNIQUE

TIME: 03 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

Q.1(a) Define operation research. [2]
Q.1(b) What are the main characteristics of operation research.? [3]
Q.1(c) Explain any four application of operation research with example. [5]

Q.2(a) Define a basic feasible solution with example. [2]
Q.2(b) Convert the following in Standard form [3]
Maximize $z = 4x + 7y$
subject to $2x + 4y \leq -7$
$x + 2y \geq 15$
$x, y \geq 0$

Q.2(c) Solve the following **[5]**
Maximize $z = 3x + 12y$
subject to $2x + 4y \leq 7$
$5x + 3y \leq 15$
$x, y \geq 0$

Q.3(a) Define Dual of an LPP [2]
Q.3(b) What are the advantages of duality? [3]
Q.3(c) Solve using dual simplex method [5]
Max $z = -3x-y$
$x + y \geq 1$
$2x + 3y \geq 2$
$x, y \geq 0$

Q.4(a) Define Integer Programming Problem [2]
Q.4(b) Differentiate between pure and mixed IPP [3]
Q.4(c) Why not round off the optimum values of an LPP instead of resorting to integer programming? [5]

Q.5(a) What is Dynamic Programming? [2]
Q.5(b) what are the characteristics of Dynamic Programming problem? [3]
Q.5(c) Solve the following using Dynamic Programming [5]
Max $3x + 4y$
s.t $2x + 5y \leq 10$
$6x + 12y \leq 18$
$x,y \geq 0$

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