**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**
**(MID SEMESTER EXAMINATION SP/2024)**

**CLASS: IMSc** **SEMESTER : VI**
**BRANCH: MATHEMATICS** **SESSION : SP/2024**

**SUBJECT: MA309 OPTIMIZATION TECHNIQUES**

**TIME: 02 Hours** **FULL MARKS: 25**

**INSTRUCTIONS:**
**1. The question paper contains 5 questions each of 5 marks and total 25 marks.**
**2. Attempt all questions.**
**3. The missing data, if any, may be assumed suitably.**
***4*. Graph paper will be supplied to the candidates**

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| | | | CO | BL |
|---|---|---|---|---|
| Q.1 | Solve the following LPP by graphical Method:<br>Max Z=3x+2y<br>Subject to:<br>-2x+y≤1<br>x≤2<br>x+y≤2<br>x,y≥0 | [5] | 1 | 1,2,3 |
| Q.2 | Solve by simplex method the following LPP<br>Max Z=5x+3y<br>Subject to:<br>x+y≤2<br>5x+2y≤10<br>3x+8y≤12<br>x,y≥0 | [5] | 1 | 1,2,3 |
| Q.3 | Four jobs are to be done on four different machines.The cost of producing ith job on the jth machine is given below: | [5] | II | 1,2,3 |

| | | | Machines | | |
|---|---|---|---|---|---|
| | | M1 | M2 | M3 | M4 |
| | J1 | 15 | 11 | 13 | 15 |
| Job | J2 | 17 | 12 | 12 | 13 |
| | J3 | 14 | 15 | 10 | 14 |
| | J4 | 16 | 13 | 11 | 17 |

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|---|---|---|---|---|
| Q.4 | Find the initial basic feasible solution to the following transportation problem<br>(a) Least Cost Method<br>(b) North West Corner rule.<br>State which of the method is better. | [5] | II | 1,2,3 |

| | | DESTINATION | | Supply |
|---|---|---|---|---|
| | 2 | 7 | 4 | 5 |
| ORIGIN | 3 | 3 | 1 | 8 |
| | 5 | 4 | 7 | 7 |
| | 1 | 6 | 2 | 14 |
| Demand | 7 | 9 | 18 | |

| | | | | |
|---|---|---|---|---|
| Q.5 | Solve the following LPP by the revised simplex method. Do till the first iteration only.<br>Max Z= x +y<br>Subject To:<br>3x+2y≤6<br>x+4y≤4<br>x ,y ≥0 | [5] | III | 1,2,3 |

**::::::26/02/2024::::::M**