# Ajay Kumar Garg Engineering College, Ghaziabad

## Department of Applied Sciences & Humanities

### Sessional Test-2

Course: MCA
Session: 2017-18
Subject: CBOT
Max Marks: 50

Semester: III
Section: MCA1,MCA2
Sub. Code: RCA-304
Time: 2 hour

**Note:** Answer **all** the sections

### SECTION-A

A Attempt **all** the parts. (5*2=10)

1. Define scrap value in Replacement problem.

2. What is inventory system?

3. Write is the need of Inventory?

4. Define in Replacement problem.

5. What is the Dual of the Dual is the given problem

### SECTION-B

B Attempt **all** the parts. (5*5=25)

6. Write the dual of the following LPP

$$\text{Min } z = x_1 + x_2 + 2x_3$$

s.t $x_1 + 2x_2 \geq 3$

$x_2 + 7x_3 \leq 6$

$x_1 - 3x_2 + 5x_3 = 5$

$x_1, x_2 \geq 0$, $x_3$ is unrestricted.

7. A company uses annually 24000 units of a raw material which costs Rs. 1.25/unit. Placing each order costs Rs. 22.5 and the carrying cost is 5.4% per year of the average inventory. Find the economic lot size and the total inventory cost (including the cost of material).

8. Solve the following LPP by Simplex method

$$\text{Max } z = 6x_1 + 8x_2$$

s.t $5x_1 + 10x_2 \leq 60$

$4x_1 + 4x_2 \leq 40$

$x_1, x_2 \geq 0$

9. Prove that the Dual of the Dual is the given Primal itself.

10. Using dual simplex method, solve the following L.P.P.

$$\text{Min } Z = 3x_1 + x_2$$

s.t. $x_1 + x_2 \geq 1$

$2x_1 + 3x_2 \geq 2$

and $x_1, x_2 \geq 0$

## SECTION-C

C  Attempt all the parts.                                          $(2*7.5=15)$

11. Solve the following LPP by using Big M method

$$\text{Max } z = 5x_1 + 6x_2$$

s.t $2x_1 + 5x_2 \leq 1500$

$3x_1 + x_2 \geq 1200$

$x_1, x_2 \geq 0$

12.

Let the value of money be assumed to be 10% per year and suppose that machine A is replaced after every 3 yrs whereas machine B is replaced after every six years, determine which machine should be purchased.

| Year | 1 | 2 | 3 | 4 | 5 | 6 |
|------|------|------|------|------|------|------|
| Machine A | 1000 | 200 | 400 | 1000 | 200 | 400 |
| Machine B | 1700 | 100 | 200 | 300 | 400 | 500 |