

Integ LLB Sem.-3 Examination

ILBCom 202

Statistics

May 2022

Time : 2-00 Hours]

[Max. Marks : 60

Instruction: Write Any Three Question.

Each question considers 20 marks.

Q.1 Maximize the objective function $Z = 8x + 12y$ subject to the following constraints:

$$x, y \geq 0;$$

$$x + y \leq 9;$$

$$x \geq 2,$$

$$y \geq 3,$$

$$3x + 6y \leq 36$$

Q.2 what is liner programming? Write assumptions and limitations of liner programming.

Q.3. obtain solutions of the following transportation problem three methods.

| Origin | Destination | | | | Supply |
|--------|-------------|----|----|----|--------|
| | P | Q | R | S | |
| A | 15 | 14 | 13 | 12 | 10 |
| B | 16 | 17 | 12 | 14 | 17 |
| C | 5 | 6 | 8 | 7 | 13 |
| D | 3 | 2 | 10 | 1 | 10 |
| Demand | 25 | 10 | 11 | 4 | 50 |

P.T.O

N-254-D

Q.4 (a) solve the following assignment problem to minimize the total time.

| Operator | 1 | 2 | 3 | 4 | 5 |
|----------|----|----|----|----|----|
| 1 | 10 | 6 | 9 | 6 | 10 |
| 2 | 6 | 9 | 12 | 11 | 11 |
| 3 | 11 | 12 | 10 | 13 | 12 |
| 4 | 10 | 6 | 7 | 8 | 9 |
| 5 | 13 | 7 | 12 | 13 | 11 |
| 6 | 8 | 11 | 8 | 10 | 12 |

(b) give assignment in the following problem for the maximum profit.

| | D ₁ | D ₂ | D ₃ | D ₄ |
|----------------|----------------|----------------|----------------|----------------|
| O ₁ | 2 | 3 | 4 | 5 |
| O ₂ | 5 | 6 | 7 | 8 |
| O ₃ | 6 | 7 | 8 | 9 |
| O ₄ | 9 | 8 | 7 | 6 |

Q.5. (A) The cost price of machine is Rs.5000. Its maintenance cost and scrap value at the end of each year is given as follow. When should the machine be replaced?

| Year | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------------------------|------|------|------|------|------|------|------|------|
| Maintenance cost in Rs. | 1500 | 1600 | 1800 | 2100 | 2500 | 2900 | 3400 | 4000 |
| Scrap value in Rs. | 3500 | 2500 | 1700 | 1200 | 800 | 500 | 500 | 500 |

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(b) The cost price of an item is Rs.7000. annual operating cost is Rs.300 for the first year and then increases by Rs.1500 every year. After how many years should the item be replaced?

Q.6 (a) The number of days of completing different jobs of a project are given below. Prepare a network of the project and determine critical path. Also find EST, EFT, LST, LFT and float time.

| Job | Time |
|-----|------|
| 1-2 | 2 |
| 2-3 | 3 |
| 2-4 | 5 |
| 3-5 | 4 |
| 3-6 | 1 |
| 4-6 | 6 |
| 4-7 | 2 |
| 5-8 | 8 |
| 6-8 | 7 |
| 7-8 | 4 |

(b) write difference between PERT and CPM.

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