



II Semester M.Com. Degree Examination, June/July 2018

(CBCS)

COMMERCE

Paper – 2.5 : Operation Research and Quantitative Techniques

Time : 3 Hours

Max. Marks : 70

Instruction : Answer all the questions.

SECTION – A

1. Answer **any seven** of the following sub-questions in about **3-4 lines each**.**Each** sub-questions carries **two** marks. (7×2=14)

a) What is the term 'Linear Programming' ?

b) What is Bernoulli distribution ?

c) State the error in Logical Sequencing.

d) Write the dual of the following problem

$$\text{Maximize } Z = 2x_1 + 3x_2$$

Subject to the constraints $x_1 \leq 4$

$$x_2 \geq 1$$

$$x_1 + 2x_2 \geq 2$$

with $x_1, x_2 \geq 0$.

e) What is Burst Event ?

f) What is meant by Pseudo-Random Numbers ?

g) State the nature of Laplace Decision Criterion.

h) Define Crash time and Crash cost.

i) Name the distribution followed by activity time in PERT Model.

j) What is the probability of at least one "H" in four tosses of a coin ?



SECTION – B

Answer **four** of the following in about **one** page. **Each** questions carries **5** marks :

(4×5=20)

2. A medical scientists claims to have found a cure for the common cold that consists of three drugs called K, S and H. His results indicate that the minimum daily adult dosage for effective treatment is 10 mg. of drug K, 6mg. of drug S, and 8 mg. of drug H. Two substances are readily available for preparing pills and drugs. Each unit of substance A contains 6 mg, 1 mg, and 2mg, of drugs K, S and H respectively and each unit of substance B contains 2 mg, 3mg and 2 mg, of the same drugs. Substance A costs Rs. 3 per unit and substance B costs Rs. 5 per unit.

3. Solve the following Assignment problems for minimum solution :

	M_1	M_2	M_3	M_4	M_5
W_1	9	5	6	7	8
W_2	8	5	7	7	8
W_3	6	8	5	6	9
W_4	8	10	7	6	5
W_5	4	6	5	6	4

4. A company has demand rate of 25 items per day and the supply rate is 40 items per day. Ordering cost per order is Rs. 60 and carrying cost is Rs. 73 in one year. Find the EOQ and the total additional cost. It is given that an item costs Rs. 20.

5. An insurance company has these data :

The probability of an insurance claim in a period of one year is 4 percent for persons under age 30, 2 percent for persons over age 30 and it is known that 30 percent of the targeted population is under age 30. What is the probability of an insurance claim in a period of one year for a randomly chosen person from the targeted population ?

6. Explain the applications of simulation to the problem of financial planning and management.

7. Write a note on Risk analysis in capital budgeting.



SECTION - C

Answer any three questions out of five. Each question carries twelve marks : (3x12=36)

8. Solve graphically the following Linear Programming Problem :

Maximize $50x_1 + 60x_2$

Subject to

$2x_1 + x_2 \leq 300$

$3x_1 + 4x_2 \leq 480$

$4x_1 + 7x_2 \leq 812$

$x_1 + x_2 \geq 0$.

9. From the given activity table and three types of estimates. Find

- 1) Draw the network diagram
- 2) The critical path
- 3) Standard deviation of the critical path
- 4) Find the probability of completion of the project in due time.
- 5) What is the probability of completing the project earlier by 10% of the time ?
- 6) What is the probability of completing the project by allowing 15% more time ?

Activity	t_o	t_n	t_p
1 - 2	2	6	10
1 - 3	2	3	4
2 - 3	7	11	15
2 - 4	6	14	16
3 - 4	6	7	14
3 - 5	6	7	14
4 - 5	2	6	10



10. Solve the transportation problem using matrix minima method :

	P	Q	R	S	Availability
A	23	27	16	18	30
B	12	17	20	51	40
C	22	28	12	32	53
Demand	22	35	25	41	

11. What is Decision Tree ? Explain the steps Involved in drawing a decision tree.

12. Explain EOQ model. What are its assumptions ? What are the practical limitations in using this formula ?

Activity	t_o	t_p	t_e
1-2	5	8	10
1-3	5	8	4
2-3	5	11	13
2-4	8	11	18
3-4	8	7	14
3-5	10	14	14
4-5	5	8	10