

Q.P. Code : 60565

Nagarjuna Degree College
38/36, Ramagondanahalli,
Yelahanka Hobli,
Bengaluru - 560 004.

Second Semester M.Com. Degree Examination, July 2019

(CBCS – 2014-15 Scheme)

Commerce

**Paper 2.5 – OPERATIONS RESEARCH AND
QUANTITATIVE TECHNIQUES**

Time : 3 Hours]

[Max. Marks : 70

SECTION – A

1. Answer any **SEVEN** questions out of Ten. Each question carries **2** marks :
(7 × 2 = 14)
- (a) Define linear programming.
 - (b) Give the meaning of Risk.
 - (c) State any four uses of Normal distribution.
 - (d) Define Operations Research.
 - (e) What do you mean by decision tree analysis?
 - (f) Define likely events.
 - (g) State the differences between PERT and CPM.
 - (h) What is crashing?
 - (i) State the software packages available for solving LPP.
 - (j) What do you mean by model building?

SECTION – B

Answer any **FOUR** questions out of Six. Each question carries **5** marks :
(4 × 5 = 20)

- 2. Twelve one rupee coins are distributed at random among 5 beggars A, B, C, D and E. Find the probability that (a) They get 4, 2, 0, 5 and 1 coins respectively
(b) Each beggar gets at least 2 coins.
- 3. Explain the different approaches of calculating the probability of an event.

Q.P. Code : 60565

4. Solve the following Assignment Problem in order to minimize the total cost. The cost matrix below gives the assignment cost when different operators are assigned to various machines.

		Operators				
		I	II	III	IV	V
Machines	A	30	25	33	35	36
	B	23	29	38	23	26
	C	30	27	22	22	22
	D	25	31	29	27	32
	E	27	29	30	24	32

5. Explain the different types of risks faced by the entrepreneur regarding capital budgeting.
6. A company makes bicycles. It produces 450 bicycles a month. It buys the tyres for bicycles from a supplier at a cost of Rs. 200 per tyre. The company's inventory carrying cost is estimated to be 15% of cost and the ordering is Rs. 5,000 per order.

Calculate :

- (a) EOQ
 - (b) Number of orders to be place per year
 - (c) Average annual ordering cost
 - (d) Average annual carrying cost
 - (e) Total cost
7. The average selling price of houses in a city is Rs. 25,00,000 with a standard deviation of Rs. 6,00,000. Assuming the distribution of selling price to be normal find :
- (a) The percentage of houses that sell for more than Rs. 27,50,000
 - (b) The percentage of houses that sell between Rs. 22,50,000 and 30,00,000
 - (c) The percentage of houses that sell for more than Rs. 20,00,000

SECTION - C

Answer any **THREE** questions out of Five. Each question carries **12** marks :

(3 × 12 = 36)

8. Determine the basic feasible solution for the TP, using NWCM, LCM and VAM. Suggest which method should be adopted.

	D ₁	D ₂	D ₃	D ₄	Supply
O ₁	6	4	1	5	14
O ₂	8	9	2	7	16
O ₃	4	3	6	2	5
Demand	6	10	15	4	35

9. The following table gives data given on normal time and cost and crash time and cost for a project.

Activity	Normal		Crash	
	Time (days)	Cost (Rs.)	Time (days)	Cost (Rs.)
1 - 2	5	600	4	1000
1 - 3	4	600	2	2000
2 - 4	5	500	3	1500
2 - 5	3	450	1	650
3 - 4	6	900	4	2000
4 - 6	8	800	4	3000
5 - 6	4	400	2	1000
6 - 7	3	450	2	800

The indirect cost per day is Rs. 100.

- Draw a network and critical path
- What are the normal project duration and associated time?
- Crash the relevant activities systematically and determine the optimum project completion time and cost.

Q.P. Code : 60565

10. Write short notes on :
- (a) Probability distribution
 - (b) Sensitivity Analysis
 - (c) Decision tree
11. The following table shows the jobs of a network along with their time estimates :

Activity	Optimistic Time	Most Likely Time	Pessimistic Time
1-2	1	1	7
1-3	1	4	7
2-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

You are required to

- (a) Draw the network for the project.
 - (b) Calculate Variance and Standard Deviation of Project Length.
 - (c) What is the probability that the project will be completed within 19 weeks?
12. Explain the meaning of "Simulation" and state its usefulness in business decision making.
-