



Reg. No. :

Name :

**Fifth Semester B.B.A. Degree Examination, December 2018
Career Related First Degree Programme under CBCSS
Core Course : BM 1541 : QUANTITATIVE TECHNIQUE FOR
MANAGEMENT
(2015 Admission Onwards)**

Time : 3 Hours

Max. Marks : 80

SECTION – A

I. Answer all questions in one or two sentences. Each question carries 1 mark.

- 1) What is OR model ?
- 2) What is descriptive model ?
- 3) What is non-degenerate basic feasible solution ?
- 4) Why is Vogel's approximation method preferred over the other methods ?
- 5) What are surplus variables ?
- 6) Write any two uses of transportation techniques.
- 7) What is corner point ?
- 8) What is feasible solution ?
- 9) What is replacement theory ?
- 10) What is Minimum Ratio ?

(10×1=10 Marks)

SECTION – B

II. Answer any eight questions not exceeding one paragraph. Each question carries 2 marks.

- 11) What is pessimistic time estimates ?
- 12) What is infeasibility ?
- 13) Write the mathematical formulation of LPP.
- 14) What are the limitations of linear programming ?
- 15) How is Operations Research useful in taking management decisions ?

P.T.O.



- 16) What are unbalanced assignment problems ?
- 17) What are PERT ?
- 18) What is free float ?
- 19) Briefly explain degeneracy in transportation problem.
- 20) Write the equations to calculate the expected time for an activity, variance of an activity in PERT calculations.
- 21) Explain replacement of items that deteriorate with time.
- 22) What are the rules for constructing network diagram ? **(8×2=16 Marks)**

SECTION – C

III. Answer any 6 questions not exceeding one page. Each question carries 4 marks.

- 23) Discuss the difference between transportation problem and assignment problem.
- 24) Discuss objective function in LPP.
- 25) Explain the classification of OR Model on the basis of structure.
- 26) A manufacturer produces two types of models M1 and M2. Each model of the type M1 requires 4 hours of grinding and 2 hours of polishing; whereas each model of the type M2 requires 2 hours of grinding and 5 hours of polishing. The manufacturers have 2 grinders and 3 polishers. Each grinder works 40 hours a week and each polisher works for 60 hours a week. Profit on M1 model is Rs. 3.00 and on model M2 is Rs. 4.00. Whatever is produced in a week is sold in the market. How should the manufacturer allocate his production capacity to the two types of models, so that he may make the maximum profit in a week ?
- 27) Solve the following LPP by graphical method :

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

Subject to

$$x_1 + x_2 \leq 30$$

$$x_2 \geq 3$$

$$0 \leq x_2 \leq 12$$

$$x_1 - x_2 \geq 0$$

$$0 \leq x_1 \leq 20$$

$$x_1, x_2 \geq 0.$$

- 28) OR is the art of finding bad answers where worse exists. Comment.
- 29) Assuming that the expected time are normally distributed, find the critical path and project duration of

Activity	Days		
	To	tm	Tp
1 - 2	2	5	14
1 - 3	9	12	15
2 - 4	5	14	17
3 - 4	2	5	8
3 - 5	8	17	20
4 - 5	6	9	12

30) Discuss the terms : Present worth factor and discount rate.

31) Differentiate PERT and CPM.

(6×4=24 Marks)

SECTION - D

IV. Answer any 2 questions not exceeding four pages. Each question carries 15 marks.

32) Discuss significance and scope of operation research.

33) Solve the Linear Programming Problem.

$$\text{Maximize : } Z = 7x_1 + 5x_2$$

Subject to

$$x_1 + 2x_2 \leq 6$$

$$4x_1 + 3x_2 \leq 12$$

$$x_1, x_2 \geq 0.$$



- 34) Given below is the time (days) required when a particular programme is assigned to a particular programmer.

		Programmers			
		A	B	C	D
Programmes	1	12	10	8	9
	2	8	9	11	7
	3	11	14	12	10
	4	9	9	8	9

Assign the programmers to the programmes in such a way that the total computing time is least.

- 35) The following table lists the jobs of a network along their time estimates.

Job	Duration (days)		
	Optimistic	Most Likely	Pessimistic
1-2	3	6	15
1-6	2	5	14
2-3	6	12	30
2-4	2	5	8
3-5	5	11	17
4-5	3	6	15
6-7	3	9	27
5-8	1	4	7
7-8	4	19	28

- Draw the project network.
- Calculate the length and variance of the critical path.
- What is the approximate probability that the jobs on the critical path will be completed in 41 days ?
(2×15=30 Marks)