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BBA

D – 2810

Reg. No. : .....

Name : .....

**Fifth Semester B.B.A. Degree Examination, December 2017  
Career Related First Degree Programme Under CBCSS  
Core Course : BM 1541 : QUANTITATIVE TECHNIQUE FOR  
MANAGEMENT  
(2014 Admission)**

Time : 3 Hours

Max. Marks : 80

**SECTION – A**

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

**(10×1=10 Marks)**

1. What is degeneracy ?
2. Define operation research as a decision making science.
3. What is VAM ?
4. What is PERT ?
5. What is critical path ?
6. What is a dummy activity ?
7. What is an unbound solution ?
8. What is a float of an activity ?
9. What is an assignment problem ?
10. What is LPP ?

P.T.O.



## SECTION – B

Answer **any 8** questions. **Each** question carries **2** marks.

**(8×2=16 Marks)**

11. What is the role of operations research in engineering ?
12. What are the types of failure in replacement decisions ?
13. What are the objectives network analysis ?
14. What is an optimal solution ?
15. What are the uses of transportation technique ?
16. What are the limitations of Operation Research ?
17. What is an assignment problem ?
18. What are the uses of network techniques ?
19. What are the situations where replacement of items needed ?
20. What is an activity and an event ?
21. What is a unbalanced transportation problem ?
22. What are the phases in application of network technique ?

## SECTION – C

Answer **any 6** questions. **Each** question carries **4** marks.

**(6×4=24 Marks)**

23. What are the phases of operation research ?
24. What are the requirements for employing linear programming technique ?
25. Differentiate PERT and CPM.
26. Explain solving an assignment method.

27. Draw a network diagram to the following activities.

Activity	Time duration	Activity	Time duration
1-2	2	1-3	4
1-4	3	2-5	1
3-5	6	4-6	5
5-6	7		

28. Solve the following minimal assignment problem.

		Man			
		1	2	3	4
Job	I	12	30	21	15
	II	18	33	9	31
	III	44	25	21	21
	IV	14	30	28	14

29. Find initial solution for the transportation problem by VAM.

	To			Supply
	W1	W2	W3	
F1	2	7	4	5
F2	3	3	1	8
F3	5	4	7	7
F4	1	6	2	14
Demand	7	9	18	

30. A company has three operational departments (weaving, processing and packing) with capacity to produce three different types of clothes namely suitings. Shirtings and woollen yielding a profit of Rs. 2, Rs. 4 and Rs. 3 per meter respectively. One meter suiting requires 3 minutes in weaving, 2 minutes in processing and 1 minute in packing. Similarly one meter of shirting requires 4 minutes in weaving, 3 minutes in each department. In a week, total run time of each department is 60, 40 and 80 hours for weaving, processing and packing departments respectively. Formulate LPP.



31. A fleet owner finds his past records that the costs per year of maintaining a truck whose purchase price is Rs. 1,60,000 are as given below :

Year	Maintenance Cost (Rs.)	Resale price (Rs.)
1	8,000	1,45,000
2	9,000	1,32,000
3	10,500	1,22,000
4	13,000	1,14,000
5	15,000	1,09,000
6	20,000	90,000
7	25,000	70,000
8	30,000	50,000

At what age a replacement is due ?

#### SECTION - D

Answer any 2 questions. Each question carries 15 marks.

(2×15=30 Marks)

32. A multi-plant company has three manufacturing plants A, B and C and two markets X and Y production cost at A, B and C is Rs. 1,500, Rs. 1,600 and Rs. 1,700 per piece respectively. selling prices in X and Y are Rs. 4,400 and Rs. 4,700 respectively. Demands in X and Y are 3,500 and 3,600 pieces respectively Production capacities of A, B and C are 2,000, 3,000 and 4,000 pieces respectively.

	To →	X	Y
From ↓			
A		1000	1500
B		2000	3000
C		1500	2500

Transportation costs are as shown in the adjacent matrix. Solve the problem as to maximise the profit.

33. Five different machines can do any of the five required jobs with different profits resulting from each assignment as shown below.

	Machines				
	A	B	C	D	E
1	30	37	40	28	40
2	40	24	27	21	36
Job 3	40	32	33	30	35
4	25	38	40	36	36
5	29	62	41	34	39

Find out maximum profit possible through optimal assignment.

34. A project schedule has the following characteristics.

Activity	Time	Activity	Time
1-2	4	1-3	1
2-4	1	3-4	1
3-5	6	4-9	5
5-6	4	5-7	8
6-8	1	7-8	2
8-1	5	9-10	7

- 1) Construct network diagram.
- 2) Compute  $T_E$  and  $T_L$  for each event.
- 3) Find EST, LST and LFT, EFT values of all activities.
- 4) Find critical path.

35. Solve the following using simplex.

$$\text{Max : } Z = 40x_1 + 80x_2$$

$$\text{S.t } 2x_1 + 3x_2 \leq 48$$

$$x_1 \leq 5$$

$$x_2 \leq 10$$

$$x_1, x_2 \geq 0.$$