



Reg. No. :

Name :

**Fifth Semester B.B.A. Degree Examination, October 2015
(Career Related First Degree Programme under CBCSS)**

Group 2(b)

Core Course

**BM 1541 – OPERATIONS RESEARCH
(2013 Admn.)**

Time : 3 Hours

Max. Marks : 80

SECTION – A

Write short answers to **ten** questions in **one** or **two** sentences **each**. Each question carries a mark of 1.

1. Define OR.
2. What is Dummy activity ?
3. What is a feasible solution in TP ?
4. What is a vector in LPP ?
5. What is meant by total elapsed time in sequencing problem ?
6. What do you mean by a fair game ?
7. What is meant by replacement theory ?
8. What is CPM ?
9. List any two limitations of OR.

10. Find trace of $M = \begin{bmatrix} 1 & 8 & 1 \\ 2 & 3 & 5 \\ 0 & 1 & -2 \end{bmatrix}$.

SECTION – B

Write **any 8** questions out of **12**. Each question carries **2** mark:

11. A manufacture produce two products P & Q from two raw materials A & B. Each unit of P requires 4 unit of raw materials A & 6 unit of raw material B. Each unit of requires 5 units of raw material A and 4 units of raw material B. The availability of raw material A is restricted to 15,000 units while that of B to 20,000 units. Find out the suitable product mix assuming the profit of P is Rs. 15/- per units that of Q is Rs. 16/- per unit.

12. Find the determinant $\begin{vmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{vmatrix}$.

13. Solve the following transportation problem using least cost entry method.

Source	Destination			Supply
	P	Q	R	
A	11	1	0	1
B	4	2	1	4
C	6	3	2	3
Demand	2	1	5	

14. Draw a network diagram from the following data :

Activity :	1-2	1-3	2-5	3-4	3-5	4-6	5-6
Duration :	2	1	4	3	6	5	4

15. What is a sequencing problem ?

16. Define : Pay off matrix

Pure strategy

17. What are the time estimates in PERT ?

18. What are the limitations of game theory ?

19. What is meant by Salesman routing problem ?

20. Explain the role of OR in decision making.



29. Find initial basic solution of the TP using NWCR

	D_1	D_2	D_3	D_4	Supply
A	1	5	3	3	34
B	3	3	1	2	15
C	0	2	2	3	12
D	2	7	2	4	19
Demand	21	25	17	7	

30. Explain Rank of matrix with example.

31. What are the features of OR ?

SECTION - D

Answer **any two** questions in **not** exceeding **four** page. **Each** question carries **15** marks.

32. What is meant by LPP ? Explain in detail the simplex method for solving LPP.

33. What are assignment problems ? Explain Hungarian method of solution to assignment problem.

34. Solve graphically the following LPP

$$\begin{aligned} \text{Maximise } z &= 6x_1 + 10x_2 \\ \text{subject to } &-3x_1 + 4x_2 \geq 12 \\ &2x_1 - x_2 \geq -2 \\ &2x_1 + 3x_2 \geq 12 \\ &x_1 \leq 4, x_2 \geq 2 \\ &x_1, x_2 \geq 0 \end{aligned}$$

35. Solve the following TP and check whether it is an optimal solution by using MODI method.

Source	Destination				Supply
	P	Q	R	S	
A	21	16	25	13	11
B	17	18	14	23	13
C	32	17	18	41	19
Demand	6	10	12	15	48