

U.G. 6th Semester Examination - 2022**BBA****[HONOURS]****Course Code : BBBACCHT601****Course Title : Operations Research**

Full Marks : 40

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*1. Answer any **ten** questions of the following:

1×10=10

- a) What is canonical form of LPP?
- b) Mention any two limitations of graphical method of solution of LPP.
- c) What do you mean by Unbalanced Assignment problem?
- d) Define pure strategies.
- e) What is a two person zero-sum game?
- f) When does degeneracy arise in transportation problem?
- g) What is Total float?

- h) Write the full forms of 'PERT' and 'CPM'.
- i) What is Network?
- j) Mention any two essential characteristics of operation research.
- k) What is an assignment problem?
- l) Give an example of unbalanced assignment problem.
- m) What is meant by an optimality test?
- n) Point out any two similarities between transportation and assignment problem.
- o) What is a transportation problem?

2. Answer any **five** of the following questions: 2×5=10

- a) What is unbound solution to an LPP?
- b) State any two differences between an Assignment problem and a Transportation problem.
- c) What is slack variable?
- d) What is mixed strategy in game?
- e) What is Critical path?
- f) Give an example of pay-off matrix of two person zero sum game.
- g) What is Dominance property in Game Theory?

h) What is MODI methods?

3. Answer any **two** of the following questions: $5 \times 2 = 10$

a) Obtain the initial solution for the following Transportation Problem using VAM: 5

Origin/Destination	D1	D2	D3	D4	Supply
O1	11	13	17	14	250
O2	16	18	14	10	300
O3	21	24	13	10	400
Demand	200	225	275	250	

b) Solve the following game by using dominance property : 5

		Player B		
		B1	B2	B3
Player A	A1	10	5	-2
	A2	13	12	15
	A3	16	14	10

c) Why does optimal solution in linear programming always lie at the corner of the feasible region? When do we get multiple optimal solution in the linear programming? Show graphically. 2+3

4. Answer any **one** of the following questions:

$10 \times 1 = 10$

a) A project schedule has the following characteristics:

Activity	A	B	C	D	E	F	G	H	I
Preceding Activity	-	-	-	A	A	B,D	C	B	F,G
Time (Days)	23	8	20	16	24	18	19	4	10

i) Construct a network diagram.

ii) Determine Critical Path.

iii) Compute Total Float, Free Float and Independent Float. $3+3+4=10$

b) Use simplex method to solve the following LPP: 10

$$\text{Max } Z = X_1 + X_2 + 3X_3$$

$$\text{subject to } 3X_1 + 2X_2 + X_3 \leq 3$$

$$2X_1 + X_2 + 2X_3 \leq 2$$

$$X_1, X_2, X_3 \geq 0$$

c) State any four areas for the application of Operation Research technique in financial management. How it does improve the performance of Organization? $1\frac{1}{2} \times 4 + 4$