

Roll No.

C

CBC-1966-U

2

SECTION - A

(Objective Type Questions) 10×1=10

Note :- Choose the correct option.

1. Making a pivot in the simplex method indicates the appropriate :
 - (a) $Z_j - C_j$ row
 - (b) Optimal column
 - (c) Quantity column
 - (d) None of these
2. For a maximization problem, the objective function coefficient for an artificial variable is :
 - (a) +M
 - (b) -M
 - (c) Zero
 - (d) None of these

CBC-1966-U

M. A. / M. Sc. Third Semester

(End Semester)

Examination Dec., 2019

MATHEMATICS

Paper - MTS- CC- 324

(Operations Research-I)

Time : Three Hours]

[Maximum Marks : 60

Note : The question paper is divided into three sections. Attempt questions as per direction.

[P. T. O.

3. If an optimal solution is degenerate, then
- (a) There are alternative optimal solution
 - (b) The solution is infeasible
 - (c) The solution is of no use to the decision maker
 - (d) None of these
4. If a dual problem has an unbounded solution, primal has :
- (a) No feasible solution
 - (b) Unbounded solution
 - (c) Feasible solution
 - (d) None of these
5. Branch and bound method divides the feasible solution space into smaller parts by :
- (a) Branching
 - (b) Bounding

[P. T. O.

- (c) Enumerating
 - (d) All of the above
6. When there are "m" rows and "n" columns in a transport problem, degeneracy is said to occur when the number of allocations is :
- (a) Less than $m+n-1$
 - (b) Greater than $m+n-1$
 - (c) Equal to $m+n-1$
 - (d) Less than $m-n+1$
7. The another term commonly used for activity stock time is :
- (a) Total float
 - (b) Free float
 - (c) Independent float
 - (d) All of the above
- <https://www.dhsgsu.com>

8. The critical path satisfy the condition that :
- (a) $E_i = L_i$ and $E_j = L_j$
 - (b) $L_j - E_i = L_i - L_j$
 - (c) $L_i - E_i = L_j - E_j = C$
 - (d) All of the above
9. If there were "n" workers and "n" jobs, there would be :
- (a) $\lfloor n \rfloor$ solutions
 - (b) $\lfloor n-1 \rfloor$ solutions
 - (c) $(\lfloor n \rfloor)^n$ solutions
 - (d) n solutions
10. If the earliest start time for an activity is 8 weeks, the latest finish time is 37 weeks and the duration time of the activity is 11 weeks, then the total float is equal to :

[P. T. O.]

- (a) 18 weeks
- (b) 14 weeks
- (c) 56 weeks
- (d) 40 weeks.

SECTION - B**(Short Answer Type Questions) 4×5=20**

Note : Attempt any four questions. Each question carries five marks.

1. Why industry is demanding operation Research?
2. Solve the linear programming problem graphically :

$$\text{Max. } Z = 8000x_1 + 7000x_2$$

$$\text{Subjected to } 3x_1 + x_2 \leq 66$$

$$x_1 + x_2 \leq 45$$

$$x_1 \leq 20$$

$$x_2 \leq 40$$

$$\text{and } x_1, x_2 \geq 0$$

- 3/ Write algorithm to find the solution of an integer programming problem by Gomory's cutting plane method.
4. Solve the minimal assignment problem whose effectiveness matrix is :

	1	2	3	4
I	2	3	4	5
II	4	5	6	7
III	7	8	9	8
IV	3	5	8	4

5. Explain North-West corner method.
6. What are the various review techniques?

SECTION - C

(Long Answer Type Questions) $3 \times 10 = 30$

Note : Attempt any three questions. Each question carries ten marks.

[P. T. O.

1. Discuss various kind of modelling in operations research.
2. Solve the linear programming problem by two-phase method.

$$\begin{aligned}
 &\text{Minimize } Z = x_1 + x_2 \\
 &\text{Subjected to constraints} \\
 &\quad 2x_1 + x_2 \geq 4 \\
 &\quad x_1 + 7x_2 \geq 7 \\
 &\text{and } x_1, x_2 \geq 0.
 \end{aligned}$$

3. Find the optimum integer solution to the linear programming problem :

$$\begin{aligned}
 &\text{Max } Z = x_1 + 2x_2 \\
 &\text{Subjected } 2x_2 \leq 7 \\
 &\quad x_1 + x_2 \leq 7 \\
 &\quad 2x_1 \leq 11 \\
 &\quad x_1 \geq 0, x_2 \geq 0 \text{ and } x_1, x_2 \text{ are integer}
 \end{aligned}$$

4. From following table construct PERT and compute :

- (i) T_E and T_L
- (ii) Float of each activity
- (iii) Critical path and its duration.

Activity	Time in weeks
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
8-9	1
8-10	8
9-10	7

[P. T. C

5. Find the optimal solution of following transportation problem :

	W_1	W_2	W_3	W_4	W_5	W_6	
F_1	5	3	7	3	8	5	3
F_2	5	6	12	5	7	11	4
F_3	2	1	3	4	8	2	2
F_4	9	6	10	5	10	9	8
Requirement	3	3	6	12	1	2	

<https://www.dhsgsu.com>
 Whatsapp @ 9300930012
 Send your old paper & get 10/-
 अपने पुराने पेपर्स भेजे और 10 रुपये पायें,
 Paytm or Google Pay से