



KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Food Engg.) 2017 Admission
V Semester Final Examination-December 2019

Meen.3106

Systems Engineering (2+0)

(41)

Marks: 50
Time: 2 hours

I Fill in the Blanks

(10x1=10)

1. The most powerful method for solving linear programming method known as _____.
2. A basic feasible solution to a ($m \times n$) transportation problem that contains exactly ($m+n-1$) allocations in independent position is known as _____.
3. The selection of the appropriate order in which waiting customers may be served is called _____.
4. In _____ models, everything is defined and the results are certain.
5. Dual of the dual is _____.
6. If demand is lesser than dummy demand node is added to make it a _____.
7. One can find the initial basic feasible solution by using _____.
8. PERT stands for _____.
9. To find the optimal solution, we apply _____.
10. The linear function of variables which is to be maximized or minimized is called _____.

II Write Short notes on any FIVE of the following

(5x2=10)

1. Explain simplex method.
2. Limitations of linear programming method
3. Explain column minima method
4. Characteristics of queuing model
5. Explain work break-down structure
6. Advantages of simulation technique
7. Explain VED Analysis

III Answer any FIVE of the following.

(5x4=20)

1. Explain in brief scope of operation research in management.
2. Explain artificial variable technique for finding out the first basic feasible solution.
3. Illustrate the least-cost method
4. Briefly explain the Hungarian method.
5. Explain models for arrival and service time.
6. A branch of Punjab National Bank has only one typist. Since the typing work varies in length (number of pages to be typed), the typing rate is randomly distributed approximating a Poisson distribution with mean service rate of 8 letters per hour. The letters arrive at a rate of 5 per hour during the entire 8-hour work day. If the typewriter is valued at Rs. 1.50 per hour, determine
 - a. Equipment utilization.
 - b. The percent time that an arriving letter has to wait.
 - c. Average system time.
 - d. Average cost due to waiting on the part of typewriter
7. Explain the phases of Project Management.

IV Write an essay on any ONE of the following

(1x10=10)

1. Solve by dual simplex method to:
 - i. Minimize $Z = -3x_1 - 2x_2$,
 - ii. Subject to $x_1 + x_2 \geq 1$,
 $x_1 + x_2 \leq 7$,
 $x_1 + 2x_2 \geq 5$,
 $x_1, x_2 \geq 0$

PTO

2. A company has one surplus truck in each of the cities A, B, C, D and E and one deficit truck in each of the cities 1, 2, 3, 4, 5 and 6. The distance between the cities in kilometers is shown in the matrix below. Find the assignment of trucks from cities in surplus to cities in deficit so that the total distance covered by vehicles is minimum.

Cities	1	2	3	4	5	6
A	12	10	15	22	18	8
B	10	18	25	15	16	12
C	11	10	3	8	5	9
D	6	14	10	13	13	12
E	8	12	11	7	13	10
