KERALA AGRICULTURAL UNIVERSITY

B.Tech.(Food Engg.) 2015 Admission

V Semester Final Examination-January-2018

Meen.3106 **Systems Engineering (2+0)** **Marks: 50**

Time: 2 hours

I **Fill in the Blanks** **(10x1=10)**

1 Linear programming deals with the optimization of a function of variables known as .....

2 A basic feasible solution that contains less than **(m+n-1)** non-negative allocations is known as .....

3 The selection of the appropriate order in which waiting customers may be served is called .....

4 ..... are called mathematical models.

5 In LPP, degeneracy occurs in ..... stages.

6 Transportation algorithm can be used for minimizing the transportation cost of ..... O origins and D destinations.

7 VAM stands for .....

8 Activities which must be completed before a particular activity starts are called .....

9 The path which takes the maximum of time is called the .....

10 To find the optimal solution we apply .....

II **Write Short notes on any FIVE of the following** **(5x2=10)**

1 Advantages of linear programming method

2 Objectives of operation research

3 Explain least cost method

4 Briefly explain the phases of project management

5 Explain how CPM differs from PERT

6 Explain Monte-Carlo method

7 Limitations of simulation Technique

III **Answer any FIVE of the following.** **(5x4=20)**

1 Define operation research and its characteristics

2 Illustrate the concept of degeneracy in simplex method

3 Explain in brief North-west corner method

4 How it is checked, if optimal assignment can be made in the current solution or not.

PTO

5 Define queuing models and also its application.

6 A person repairing radios finds that the time spent on the radio sets has been exponential distribution with mean 20 minutes. If the radios are repaired in the order in which they come in and their arrival is approximately Poisson with an average rate of 15 for 8-hour day, what is the repairman's expected idle time each day? How many jobs are ahead of the average set just brought in?

7 Explain in brief network construction?

IV **Write an essay on any ONE of the following** **(1x10=10)**

1 Solve by dual simplex method the following problem:

Minimize $Z = 2x_1 + 2x_2 + 4x_3$,

Subject to $2x_1 + 3x_2 + 5x_3 \geq 2$,

$3x_1 + x_2 + 7x_3 \leq 3$,

$x_1 + 4x_2 + 6x_3 \leq 5$,

$x_1, x_2, x_3 \geq 0$.

2 A company has four warehouse and six stores. The warehouses altogether have a surplus of 22 units of a given commodity, divided among them as follows:

Warehouses	1	2	3	4
Surplus	5	6	2	9

The six stores altogether need 22 units of the commodity. Individual requirements at stores 1, 2,3,4,5 and 6 are 4, 4,6,2,4 and 2 units respectively.

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