

Q.1 When slack of an activity is positive

- it represents a situation where extra resources are available and the completion of project is not delayed
- it represents that a program falls behind schedule and additional resources are required to complete the project in time
- the activity is critical and any delay in its performance will delay the completion of whole project

Q.2 Dummy activities are used to

- Maintain the required net work

Q.3 Slack represents the difference between the

- earliest completion time and latest allowable time

Q.4 In inventory control, the economic ordering quantity is obtained by the quantity whose procurement cost is equal to

- Inventory carrying cost.

Q.5 The most important function of inventory control is

- stock control system
- to run the stores effectively
- technical responsibility for the state of materials

Q.6 In product layout

- specialized and strict supervision is required
- machines cannot be used to their maximum capacity
- manufacturing cost rises with a fall in the volume of production

Q.7 A feasible solution to the linear programming problem should

- satisfy the problem constraints and non-negativity restrictions

Q.8 Which of the following conditions are necessary for applying linear programming?

- These must be a well defined objective function.
- The decision variables should be interrelated and non-negative.
- The resources must be in limited supply.

Q.9 Linear programming can be applied successfully to

- chemical industry

- oil industry
- banks

Q.10 In inventory control theory, the economic order quantity is

- optimum lot size

Q.11 Linear programming model can be applied to line balancing problem and transportation problem.

- True

Q.12 A-B-C analysis is used in

- inventory control

Q.13 In A-B-C analysis, which class of items are generally large in number?

- C

Q.14 Simplex method is the method used for

- linear programming

Q.15 when does degeneracy happen in transportation problem?

- In transportation problem with m origins and n destinations, if a IBFS has less than $m+n-1$ allocations, the problem is said to be a degenerate problem.

Q.16 what is an unbalanced transportation problem?

- If the total availability from all origins is not equal to the total demand of all destinations, then it is called unbalanced transportation problem.
- The transportation problem is balanced if the total availability is equal to total demand.
- An IBFS can be obtained only for balanced transportation problem.

Q.17 what is an assignment problem?

- Given n facilities and n jobs and given the effectiveness of each facility for each job, the problem is to assign each facility to one and only job so as to optimize the given measure of effectiveness.

Q.18 what is an unbalanced assignment problem?

- An assignment problem is an unbalanced problem if the number of jobs is not equal to no. of facilities. The Hungarian method of solution requires a square matrix. Hence fictitious facilities or jobs are added and assigned 0 costs to the corresponding cells of the

matrix. These cells are treated the same way as the real cost cells during the solution procedure.

Q.19 what is a travelling salesman problem?

- There is a no. of cities a salesman must visit. The distance (or time or cost) between every pair of cities is known. He starts from his home city, passes through each city once and only once and returns to his home city. The problem is to find the routes shortest in distance (or time or cost).

Q.20 Define Idle time on a machine in a sequencing problem

- It is the time the machine remains idle i.e. (without work) during the elapsed time is the idle time.

Q.21 What is meant LPP?

- Linear programming problem deals with the optimization (maximization or minimization) of a function of decision variables subject to a set of constraints.

Q.22 Define a slack variables.

- Non-negative variables that are added to the left hand side of \leq constraints to convert them to equalities are called as slack variables.

Q.23 Define a surplus variables.

- Non-negative variables that are subtracted from the left hand side of \geq constraints to convert them to equalities are called surplus variables.

Q.24 Define Basic feasible solution

- It is a Basic feasible solution that also satisfies the Non-negativity restrictions. All variables in a Basic solution are ≥ 0 .

Q.25 Define O.R.

- Operations Research is the application of scientific methods, techniques and tools to operations of systems to obtain optimal solution to the problems; it provides a quantitative technique to the managers for making better decisions for operations under control.

Q.26 Write applications of O.R.

- Production, blending, product mix.
- Inventory control, demand forecast, sale and purchase.
- Transportation, repair and maintenance, scheduling and sequencing.

- Planning, scheduling and controlling of projects.
- Optimal allocation of men, machines, materials, time and money.
- Location and size of warehouses, distributions centres, retail depots, etc.
- Cash management so that all sections or departments receive adequate supply of funds.

Q.27 Define objective function and constraints in LPP?

- It is a function of decision variables whose value must be optimized (maximized or minimized)
- It is a set of simultaneous linear equations (or in equalities).

Q.28 Define optimum basic feasible solution?

- It is the basic feasible solution that also optimizes the objective function.

Q.29 Define artificial variable?

- Non-negative variables that are added to the constraints of (\geq) or ($=$) type. The purpose of introducing artificial variables is just to obtain an initial basic feasible solution.

Q.30 Define a slack variable? How many slack variables would you use in a LPP?

- Non-negative variables that are added to the left hand side of \geq constraints to convert them to equalities are called as slack variables.

Q.31 What is the relation between assignment and transportation problems?

- The transportation problem deals with the transportation of a product manufactured at different plants or factories (supply origins) to a number of different warehouses (demand destinations). The objective is to satisfy the destination requirement within the plant capacity at minimum transportation cost.
- Given n facilities and n jobs and given the effectiveness of each facility for each job, the problem is to assign each facility to one only job so as to optimize the given measure of effectiveness.
- Examples: products to factories, jobs to machines.

Q.32 How do you convert an unbalanced assignment problem into a balanced assignment problem?

- If no. of rows $>$ no. of columns, then add extra one column and set cost as (0),
- If no. of columns $>$ no. of rows, then add extra one row and set cost as (0), then the unbalanced assignment problem is converted into a balanced assignment problem.

Q.33 State any two methods for finding initial basic feasible solution in a transportation problem?

- Total demand=Total supply,
- No.of allocations= $m+n-1$,

These are the two methods for finding the initial basic solution in a transportation problem.

Q.34 what is TORA?

- The Temporally Ordered Routing Algorithm (TORA) is an algorithm for routing data
- TORA tutorial software deals with the following algorithms:
 - Solution of simultaneous linear equations
 - Linear programming
 - Transportation model
 - Integer programming
 - Network models
 - Project analysis by CPM/PERT
 - Poisson queuing models
 - Zero-sum games