302: DECISION SCIENCE – MCQs

Q. no	Question	Answer
1.	Decision Science approach is. a. Multi-disciplinary b. Scientific c. Intuitive d. All of the above	A
2.	For analyzing a problem, decision-makers should studyIts qualitative aspects 2. Its quantitative aspects 3. Both a & b 4. Neither a nor b	C
3.	Decision variables are a) Controllable b) Uncontrollable c) Parameters d) None of the above	A
4.	A model is a) An essence of reality b) An approximation c) An idealization d) All of the above	B
5.	Managerial decisions are based on a. An evaluation of quantitative data b. The use of qualitative factors+ c. Results generated by formal models d. All of the above	D
6.	The use of decision models a) Is possible when the variables value is known b) Reduces the scope of judgement & intuition known withcertainty in decision-making c) Require the use of computer software d) None of the above	C
7.		c

	Every mathematical model a. Must be deterministic b. Requires computer aid for its solution c. Represents data in numerical form d. All of the above	
8.	A physical model is example of a. An iconic model b. An analogue model c. A verbal model d. A mathematical model	A
9.	An optimization model a. Provides the best decision b. Provides decision within its limited context c. Helps in evaluating various alternatives d. All of the above	C
10.	The quantitative approach to decision analysis is a a. Logical approach b. Rational approach c. Scientific approach d. All of the above	C
11.	The qualitative approach to decision analysis relies on a. Experience b. Judgement c. Intuition d. All of the above	D
12.	The mathematical model of an LP problem is important because a. It helps in converting the verbal description & numerical data into mathematical expression b. Decision-makers prefer to work with formal models c. It captures the relevant relationship among decision factors d. It enables the use of algebraic technique	A
13.	Linear programming is a a. Constrained optimization technique b. Technique for economic allocation of limited resources c. Mathematical technique d. All of the above	D
14.	A constraint in an LP model restricts	d

	a. Value of objective function b. Value of a decision variable c. Use of the available resources d. All of the above	
15.	The distinguishing feature of an LP model is a. Relationship among all variables is linear b. It has single objective function & constraints c. Value of decision variables is non-negative d. All of the above	A
16.	Constraints in an LP model represents a. Limitations b. Requirements c. Balancing limitations & requirements d. All of the above	D
17.	Non-negativity condition is an important component of LP model because a. Variables value should remain under the control of the decision-maker b. Value of variables make sense & correspond to real-world problems c. Variables are interrelated in terms of limited resources d. None of the above	B
18.	Before formulating a formal LP model, it is better to a. Express each constrain in words b. Express the objective function in words c. Verbally identify decision variables d. All of the above	D
19.	Maximization of objective function in an LP model means a. Value occurs at allowable set of decisions b. Highest value is chosen among allowable decisions c. Neither of above d. Both a & b	A
20.	Which of the following is not a characteristic of the LP model a. Alternative courses of action b. An objective function of maximization type c. Limited amount of resources d. Non-negativity condition on the value of decision variables.	B
21.	The best use of linear programming technique is to find an optimal use of a. Money b. Manpower c. Machine	d

	d. All of the above	
22.	Which of the following is not a characteristic of the LP a. Resources must be limited b. Only one objective function c. Parameters value remains constant during the planning period d. The problem must be of minimization type	d
23	Non-negativity condition in an LP model implies a. A positive coefficient of variables in objective function b. A positive coefficient of variables in any constraint c. Non-negative value of resources d. None of the above	D
24	Which of the following is an assumption of an LP model a. Divisibility b. Proportionality c. Additivity d. All of the above	D
25	Which of the following is a limitation associated with an LP model a. The relationship among decision variables in linear b. No guarantee to get integer valued solutions c. No consideration of effect of time & uncertainty on LP model d. All of the above	D
26	The graphical method of LP problem uses a. Objective function equation b. Constraint equations c. Linear equations d. All of the above	D
27	A feasible solution to an LP problem a. Must satisfy all of the problem's constraints simultaneously b. Need not satisfy all of the constraints, only some of them c. Must be a corner point of the feasible region d. Must optimize the value of the objective function	A
28	Which of the following statements is true with respect to the optimal solution of an LP problem a. Every LP problem has an optimal solution b. Optimal solution of an LP problem always occurs at an extreme point c. At optimal solution all resources are completely used d. If an optimal solution exists, there will always be at least one at a corner	D
29		a

	An iso-profit line represents a. An infinite number of solutions all of which yield the same profit b. An infinite number of solution all of which yield the same cost c. An infinite number of optimal solutions d. A boundary of the feasible region	
30	If an iso-profit line yielding the optimal solution coincides with a constaint line, then a. The solution is unbounded b. The solution is infeasible c. The constraint which coincides is redundant d. None of the above	d
31	While plotting constraints on a graph paper, terminal points on both the axes are connected by a straight line because a. The resources are limited in supply b. The objective function as a linear function c. The constraints are linear equations or inequalities d. All of the above	C
32	A constraint in an LP model becomes redundant because a. Two iso-profit line may be parallel to each other b. The solution is unbounded c. This constraint is not satisfied by the solution values d. None of the above	D
33	If two constraints do not intersect in the positive quadrant of the graph, then a. The problem is infeasible b. The solution is unbounded c. One of the constraints is redundant d. None of the above	A
34	Constraints in LP problem are called active if they a. Represent optimal solution b. At optimality do not consume all the available resources c. Both a & b d. None of the above	A
35	The solution space (region) of an LP problem is unbounded due to a. An incorrect formulation of the LP model b. Objective function is unbounded c. Neither a nor b d. Both a & b	C
36		a

	While solving a LP model graphically, the area bounded by the constraints is called a. Feasible region b. Infeasible region c. Unbounded solution d. None of the above	
37	37. Alternative solutions exist of an LP model when a. One of the constraints is redundant b. Objective function equation is parallel to one of the constraints c. Two constraints are parallel d. All of the above	B
38	While solving a LP problem, infeasibility may be removed by a. Adding another constraint b. Adding another variable c. Removing a constraint	c
39	If a non-redundant constraint is removed from an LP problem then a. Feasible region will become larger b. Feasible region will become smaller c. Solution will become infeasible d. None of the above	A
40	If one of the constraint of an equation in an LP problem has an unbounded solution, then a. Solution to such LP problem must be degenerate b. Feasible region should have a line segment c. Alternative solutions exist d. None of the above	B
41	The initial solution of a transportation problem can be obtained by applying any known method. However, the only condition is that a. The solution be optimal b. The rim conditions are satisfied c. The solution not be degenerate d. All of the above	B
42	The dummy source or destination in a transportation problem is added to a. Satisfy rim conditions b. Prevent solution from becoming degenerate c. Ensure that total cost does not exceed a limit d. None of the above	A
43	The occurrence of degeneracy while solving a transportation problem means that a. Total supply equals total demand	b

	b. The solution so obtained is not feasible c. The few allocations become negative d. None of the above	
44	An alternative optimal solution to a minimization transportation problem exists whenever opportunity cost corresponding to unused route of transportation is: a. Positive & greater than zero b. Positive with at least one equal to zero c. Negative with at least one equal to zero d. None of the above	B
45	One disadvantage of using North-West Corner rule to find initial solution to the transportation problem is that a. It is complicated to use b. It does not take into account cost of transportation c. It leads to a degenerate initial solution d. All of the above	B
46	The solution to a transportation problem with 'm' rows (supplies) & 'n' columns (destination) is feasible if number of positive allocations are a. m+n b. m*n c. m+n-1 d. m+n+1	C
47	If an opportunity cost value is used for an unused cell to test optimality, it should be a. Equal to zero b. Most negative number c. Most positive number d. Any value	B
48	During an iteration while moving from one solution to the next, degeneracy may occur when a. The closed path indicates a diagonal move b. Two or more occupied cells are on the closed path but neither of them represents a corner of the path. c. Two or more occupied cells on the closed path with minus sign are tied for lowest circled value d. Either of the above	C
49	The large negative opportunity cost value in an unused cell in a transportation table is chosen to improve the current solution because a. It represents per unit cost reduction b. It represents per unit cost improvement c. It ensure no rim requirement violation	a

	d. None of the above	
50	The smallest quantity is chosen at the corners of the closed path with negative sign to be assigned at unused cell because a. It improve the total cost b. It does not disturb rim conditions c. It ensure feasible solution d. All of the above	c
51	When total supply is equal to total demand in a transportation problem, the problem is said to be a. Balanced b. Unbalanced c. Degenerate d. None of the above	C
52	Which of the following methods is used to verify the optimality of the current solution of the transportation problem a. Least cost method b. Vogel's approximation method c. Modified distribution method d. All of the above	A
53	The degeneracy in the transportation problem indicates that a. Dummy allocation(s) needs to be added b. The problem has no feasible solution c. The multiple optimal solution exist d. a & b but not c	C
54	An assignment problem is considered as a particular case of a transportation problem because a. The number of rows equals columns b. All $x_{ij} = 0$ or 1 c. All rim conditions are 1 d. All of the above	D
55	An optimal assignment requires that the maximum number of lines that can be drawn through squares with zero opportunity cost be equal to the number of a. Rows or columns b. Rows & columns c. Rows + columns – 1 d. None of the above	d
56	While solving an assignment problem, an activity is assigned to a resource through a square with zero opportunity cost because the objective is to a. Minimize total cost of assignment b. Reduce the cost of assignment to zero c. Reduce the cost of that particular assignment to zero d. All of the above	A
57	The method used for solving an assignment problem is called	c

	a. Reduced matrix method b. MODI method c. Hungarian method d. None of the above	
58	The purpose of a dummy row or column in an assignment problem is to a. Obtain balance between total activities & total resources b. Prevent a solution from becoming degenerate c. Provide a means of representing a dummy problem d. None of the above	A
59	Maximization assignment problem is transformed into a minimization problem by a. Adding each entry in a column from the maximization value in that column b. Subtracting each entry in a column from the maximum value in that column c. Subtracting each entry in the table from the maximum value in that table d. Any one of the above	C
60	If there were n workers & n jobs there would be a. n! solutions b. (n-1)! solutions c. $(n!)_n$ solutions d. n solutions	A
61	An assignment problem can be solved by a. Simplex method b. Transportation method c. Both a & b d. None of the above	c
62	For a salesman who has to visit n cities which of the following are the ways of his tour plan a. n! b. (n+1)! c. (n-1)! d. n	D
63	The assignment problem a. Requires that only one activity be assigned to each resource b. Is a special case of transportation problem c. Can be used to maximize resources d. All of the above	D
64	An assignment problem is a special case of transportation problem, where a. Number of rows equals number of columns b. All rim conditions are 1	b

	c. Values of each decision variable is either 0 or 1 d. All of the above	
65	Every basic feasible solution of a general assignment problem, having a square pay-off matrix of order, n should have assignments equal to a. 2n+1 b. 2n-1 c. m+n-1 d. m+n	B
66	To proceed with the MODI algorithm for solving an assignment problem, the number of dummy allocations need to be added are a. n b. 2n c. n-1 d. 2n-1	C
67	The Hungarian method for solving an assignment problem can also be used to solve a. A transportation problem b. A travelling salesman problem c. A LP problem d. Both a & b	B
68	An optimal solution of an assignment problem can be obtained only if a. Each row & column has only one zero element b. Each row & column has at least one zero element c. The data is arrangement in a square matrix d. None of the above	D
69	Customer behavior in which the customer moves from one queue to another in a multiple channel situation is a. Balking b. Reneging c. Jockeying d. Altering	C
70	Which of the following characteristics apply to queuing system a. Customer population b. Arrival process c. Both a & b d. Neither a nor b	C
71	Which of the following is not a key operating characteristics apply to queuing system a. Utilization factor b. Percent idle time c. Average time spent waiting in the system & queue d. None of the above	D
72	Priority queue discipline may be classified as	c

	a. Finite or infinite b. Limited & unlimited c. Pre-emptive or non-pre-emptive d. All of the above	
73	The calling population is assumed to be infinite when a. Arrivals are independent of each other b. Capacity of the system is infinite c. Service rate is faster than arrival rate d. All of the above	A
74	Which of the cost estimates & performance measures are not used for economic analysis of a queuing system a. Cost per server per unit of time b. Cost per unit of time for a customer waiting in the system c. Average number of customers in the system d. Average waiting time of customers in the system	D
75	A calling population is considered to be infinite when a. All customers arrive at once b. Arrivals are independent of each other c. Arrivals are dependent upon each other d. All of the above	B
76	The cost of providing service in a queuing system decreases with a. Decreased average waiting time in the queue b. Decreased arrival rate c. Increased arrival rate d. None of the above	D
77	Service mechanism in a queuing system is characterized by a. Server's behavior b. Customer's behavior c. Customers in the system d. All of the above	A
78	Probabilities of occurrence of any state are a. Collectively exhaustive b. Mutually exclusive c. Representing one of the finite numbers of states of nature in the system d. All of the above	D
79	In a matrix of transition probability, the probability values should add up to one in each a. Row b. Column c. Diagonal	a

	d. All of the above	
80	In a matrix of transition probability, the element a_{ij} where i=j is a a. Gain b. Loss c. Retention d. None of the above	C
81	In Markov analysis, state probabilities must a. Sum to one b. Be less than one c. Be greater than one d. None of the above	A
82	State transition probabilities in the Markov chain should a. Sum to 1 b. Be less than 1 c. Be greater than 1 d. None of the above	A
83	If a matrix of transition probability is of the order n*n, then the number of equilibrium equations would be a. n b. n-1 c. n+1 d. None of the above	A
84	In the long run, the state probabilities become 0 & 1 a. In no case b. In same cases c. In all cases d. Cannot say	C
85	While calculating equilibrium probabilities for a Markov process, it is assumed that a. There is a single absorbing state b. Transition probabilities do not change c. There is a single non-absorbing state d. None of the above	B
86	The first-order Markov chain is generally used when a. Transition probabilities are fairly stable b. Change in transition probabilities is random c. No sufficient data are available d. All of the above	A
87	A problem is classified as Markov chain provided a. There are finite number of possible states	d

	b. States are collectively exhaustive & mutually exclusive c. Long-run probabilities of being in a particular state will be constant over time d. All of the above	
88	The transition matrix elements remain positive from one point to the next. This property is known as: a. Steady-state property b. Equilibrium property c. Regular property d. All of the above	c
89	Markov analysis is useful for: a. Predicting the state of the system at some future time b. Calculating transition probabilities at some future time c. All of the above d. None of the above	C
90	Which of the following is not one of the assumptions of Markov analysis: a. There are a limited number of possible states b. A future state can be predicted from the preceding one c. There are limited number of future periods d. All of the above	C
91	An advantage of simulation as opposed to optimization is that a. Several options of measure of performance can be examined b. Complex real-life problems can be studied c. It is applicable in cases where there is an element of randomness in a system d. All of the above	D
92	The purpose of using simulation technique is to a. Imitate a real-world situation b. Understand properties & operating characteristics of complex real-life problems c. Reduce the cost of experiment on a model of real situation d. All of the above	D
93	Which of the following is not the special purpose simulation language a. BASIC b. GPSS c. GASP d. SIMSCRIPT	A
94	As simulation is not an analytical model, therefore the result of simulation must be viewed as a. Unrealistic b. Exact	c

	c. Approximation d. Simplified	
95	While assigning random numbers in Monte Carlo simulation, it is a. Not necessary to assign the exact range of random number interval as the probability b. Necessary to develop a cumulative probability distribution c. Necessary to assign the particular appropriate random numbers d. All of the above	B
96	Analytical results are taken into consideration before a simulation study so as to a. Identify suitable values of the system parameters b. Determine the optimal decision c. Identify suitable values of decision variables for the specific choices of system parameters d. All of the above	C
97	Biased random sampling is made from among alternatives which have a. Equal probability b. Unequal probability c. Probability which do not sum to 1 d. None of the above	B
98	Large complicated simulation models are appreciated because a. Their average costs are not well-defined b. It is difficult to create the appropriate events c. They may be expensive to write and use as an experimental device d. All of the above	C
99	Simulation should not be applied in all cases because it a. Requires considerable talent for model building & extensive computer programming efforts b. Consumes much computer time c. Provides at best approximate solution to problem d. All of the above	D
100	Simulation is defined as a. A technique that uses computers b. An approach for reproducing the processes by which events by chance & changes are created in a computer c. A procedure for testing & experimenting on models to answer what if____, then so & so____types of questions d. All of the above	d
101	The general purpose system simulation language a. Requires programme writing b. Does not require programme writing c. Requires predefined coding forms	b

	d. Needs a set of equations to describe a system	
102	Special simulation languages are useful because they a. Reduce programme preparation time & cost b. Have the capability to generate random variables c. Require no prior programming knowledge d. All of the above	d
103	Few causes of simulation analysis failure are a. Inadequate level of user participation b. Inappropriate levels of detail c. Incomplete mix of essential skills d. All of the above	d
104	To make simulation more popular, we need to avoid a. Large cost over runs b. Prolonged delays c. User dissatisfaction with simulation results d. All of the above	d

1. The application of OR techniques involves.....approach

a) Individual

b) Team

c) Critical

d) None of the above

Answer- : (b)

2. Opportunity loss refers to

a) the expected value of a bad decision.

b) the expected loss from a bad decision.

c) the difference between the actual payoff and the optimal payoff.

d) the regret from not having made a decision.

Answer-:(c)

3. All of the following are steps in the decision-making process EXCEPT:

a) Define the problem

b) Compute the posterior probabilities

c) Identify possible outcomes

d) List payoffs

Answer-:(b)

4. Which of the following is (are) types of decision-making environments?

a) Decision making under uncertainty

b) Decision making under certainty

c) Decision making under risk

d) All of the above

Answer -: (**d)**

5. A good decision always implies that we

a) will obtain the best final results

b) have used appropriate quantitative analysis.

c) have followed a logical process.

d) have based the decision on all available appropriate information.

Answer-: (c) have followed a logical process.

6. Which of the following might be viewed as an "optimistic" decision criterion?

a) Hurwicz criterion

b) Maximin

c) Maximax

d) Minimax

Answer-:(c)

7. Decision alternatives

a) should be identified before decision criteria are established.

b) are limited to quantitative solutions

c) are evaluated as a part of the problem definition stage.

d) are best generated by brain-storming.

Answer-:(a)

8. The equally likely decision criterion is also known as

a) Bayes'.

b) Laplace.

c) minimax.

d) Hurwicz.

Answer-: (b)

9. Which of the following is a property of all linear programming problems?

a) alternate courses of action to choose from

b) minimization of some objective

c) a computer program

d) usage of graphs in the solution

Answer-:(a)

10. A point that satisfies all of a problem's constraints simultaneously is a(n)

a) maximum profit point.

b) corner point.

c) intersection of the profit line and a constraint.

d) None of the above

Answer-: (d)

11. The first step in formulating an LP problem is

a) Graph the problem.

b) Understand the managerial problem being faced.

c) Identify the objective and the constraints.

d) Define the decision variables.

Answer-:(b) understand the managerial problem being faced.

12. LP theory states that the optimal solution to any problem will lie at

a) the origin.

b) a corner point of the feasible region.

c) the highest point of the feasible region.

d) the lowest point in the feasible region.

Answer-:(b)

13. Consider the following linear programming problem:

Maximize 12X +10Y

Subject to:

4X + 3Y ch7 <= 480

2X + 3Y ch7 <= 360

all variables >= 0

Which of the following points (X,Y) could be a feasible corner point?

a) (40,48)

b) (120,0)

c) (180,120)

d) (30,36)

Answer-: (b)

14. Management science and operations research both involve

a) qualitative managerial skills.

b) quantitative approaches to decision making.

c) operational management skills.

d) scientific research as opposed to applications.

Answer-: (b)

15. Which of the following does not represent a factor a manager might considerwhen employing linear programming for a production scheduling?

a) labor capacity

b) employee skill levels

c) warehouse limitations

d) none of the above

Answer-: (d) none of the above

16. The quantitative analysis approach requires

a) the manager's prior experience with a similar problem.

b) a relatively uncomplicated problem.

c) mathematical expressions for the relationships.

d) each of the above is true.

Answer-: (c)

17. In labor planning formulation, how would you write the constraint that there are only 10 full- time tellers (labeled as T) available?

a) $T + 10 > 0$

b) $T > 10$

c) $T \leq 10$

d) All of the above are correct ways.

Answer-:(c)

18. A type of linear programming problem that is used in marketing is called the

a) media selection problem.

b) Madison Avenue problem.

c) marketing allocation problem.

d) all of the above

Answer-: (a)

19. The maximization or minimization of a quantity is the

a) goal of management science.

b) decision for decision analysis.

c) constraint of operations research.

d) objective of linear programming.

Answer-: (d) objective of linear programming.

20. Decision variables

a) tell how much or how many of something to produce, invest, purchase, hire, etc.

b) represent the values of the constraints.

c) measure the objective function.

d) must exist for each constraint.

Answer-: (a)

21. Which of the following is a valid objective function for a linear programming problem?

a) Max 5xy

b) Min 4x + 3y + (2/3)z

c) Max 5x2+ 6y2

d) Min (x1 + x2)/x3

Answer-: (b)

22. Which of the following statements is NOT true?

a) A feasible solution satisfies all constraints.

b) An optimal solution satisfies all constraints.

c) An infeasible solution violates all constraints.

d) A feasible solution point does not have to lie on the boundary of the feasible region.

Answer-: (c)

23. A solution that satisfies all the constraints of a linear programming problem except thenon-negativity constraints is called

a) optimal.

b) feasible.

c) infeasible.

d) semi-feasible.

Answer-: (c)

24. In converting a less-than-or-equal constraint for use in a simplex table, we mustadd

a) a surplus variable.

b) a slack variable.

c) an artificial variable.

d) both a surplus and a slack variable.

Answer-: (b)

25. Slack

a) Is the difference between the left and right sides of a constraint.

b) Is the amount by which the left side of a ≤ constraint is smaller than the right side.

c) Is the amount by which the left side of a ≥ constraint is larger than the right side.

d) Exists for each variable in a linear programming problem.

Answer-: (b)

26. Unboundedness is usually a sign that the LP problem

a) has finite multiple solutions.

b) is degenerate.

c) contains too many redundant constraints.

d) has been formulated improperly.

Answer-: (d)

27. To find the optimal solution to a linear programming problem using the graphical method

a) find the feasible point that is the farthest away from the origin.

b) find the feasible point that is at the highest location.

c) find the feasible point that is closest to the origin.

d) None of the alternatives is correct.

Answer-: (d)

28. Which of the following special cases does not require reformulation of the problem inorder to obtain a solution?

a) alternate optimality

b) infeasibility

c) unboundedness

d) each case requires a reformulation.

Answer-: (a)

29. Whenever all the constraints in a linear program are expressed as equalities, thelinear program is said to be written in

a) standard form.

b) bounded form.

c) feasible form.

d) alternative form.

Answer-: (a)

30. In applying Vogel's approximation method to a profit maximization problem, row andcolumn penalties are determined by:

a) finding the largest unit cost in each row or column.

b) finding the smallest unit cost in each row or column.

c) finding the difference between the two lowest unit costs in each row and column.

d) finding the difference between the two highest unit costs in each row and column.

Answer-: (d)

31. The northwest corner rule requires that we start allocating units to shipping routes in the:

a) middle cell.

b) Lower right corner of the table.

c) Upper right corner of the table.

d) Upper left-hand corner of the table.

Answer-:(d)

32. In a transportation problem, when the number of occupied routes is less than the numberof rows plus the number of columns -1, we say that the solution is:

a) Unbalanced.

b) Degenerate.

c) Infeasible.

d) Optimal.

Answer-: (c)

33. The only restriction can be placed on the initial solution of a transportation problem is that:

a) must have nonzero quantities in a majority of the boxes.

b) all constraints must be satisfied.

c) demand must equal supply.

d) must have a number (equal to the number of rows plus the number of columnsminus one) of boxes which contain nonzero quantities.

Answer-: (b)

34. The table

To=>	1	2	3	Supply
From A	3	6 40	4	40
B	3	4 30	5	30
C	5 20	7	6 10	30

represents a solution that is:

a) an initial solution.

b) Infeasible.

c) degenerate.

d) all of the above

Answer-: (c)

35. Which of the following is used to come up with a solution to the assignment problem?

a) MODI method

b) northwest corner method

c) stepping-stone method

d) Hungarian method

Answer-: (d)

36. The graph that plots the utility value versus monetary value is called:

a) utility curve.

b) decision tree graph.

c) Laplace curve.

d) benefit curve.

Answer-:(a)

37. What is wrong with the following table?

	To==>	1	2	3	Dummy	Supply
From	A	10	8 80	12	0 20	100
	B	6 120	7 40	4 30	0	150
	C	10	9 10	6 170	0 80	250
	Demand	120	80	200	100	

a) The solution is infeasible.

b) The solution is degenerate.

c) The solution is unbounded.

d) Nothing is wrong.

Answer-: (a)

38. The solution presented in the following table is

Table 10-4

	To==>	1	2	3	Dummy	Supply
From	A	10	8 80	12	0 20	100
	B	6 120	7	4 30	0	150
	C	10	9	6 170	0 80	250
	Demand	120	80	200	100	

a) infeasible

b) degenerate

c) unbounded

d) Optimal

Answer-:(d)

39. The solution shown

	To==>	1	2	3	Dummy	Supply
From	A	| 10	| 8	| 12	| 0 100	100
	B	| 6 120	| 7	| 4 30	| 0	150
	C	| 10	| 9 80	| 6 170	| 0	250
	Demand	120	80	200	100	

was obtained by Vogel's approximation. The difference between the objective function for this solution and that for the optimal is

a) 40

b) 60

c) 80

d) 100

Answer-: (c)

40. Which method usually gives a very good solution to the assignment problem?

a) northwest corner rule

b) Vogel's approximation method

c) MODI method

d) stepping-stone method

Answer-:(b)

41. Infeasibility means that the number of solutions to the linear programming models that satisfies all constraints is

a) at least 1.

b) 0.

c) an infinite number.

d) at least 2.

Answer-: (b)

42. The stepping-stone method requires that one or more artificially occupied cells with a flow of zero be created in the transportation tableau when the number of occupied cells is fewer than

a) m + n − 2

b) m + n − 1

c) m + n

d) m + n + 1

Answer-: (b)

43. The per-unit change in the objective function associated with assigning flow to anunused arc in the transportation simplex method is called the

a) net evaluation index.

b) degenerate value.

c) opportunity loss.

d) simplex multiplier.

Answer-: (a)

44. The difference between the transportation and assignment problems is that

a) total supply must equal total demand in the transportation problem

b) the number of origins must equal the number of destinations in thetransportation problem

c) each supply and demand value is 1 in the assignment problem

d) there are many differences between the transportation and assignment problems

Answer-: (c)

45. An example of a heuristic is the

a) minimum-cost method.

b) stepping-stone method.

c) Hungarian method.

d) MODI method.

Answer-: (a)

46. A solution to a transportation problem that has less than m + n − 1 cells withpositive allocations in the transportation table is

a) an optimal solution.

b) an initial feasible solution.

c) a minimum-cost solution.

d) a degenerate solution.

Answer-:(d)

47. Using the transportation simplex method, the optimal solution to the transportationproblem has been found when

a) there is a shipment in every cell.

b) more than one stepping-stone path is available.

c) there is a tie for outgoing cell.

d) the net evaluation index for each unoccupied cell is ≥ 0.

Answer-: (d)

48. Identifying the outgoing arc in Phase II of the transportation simplex method isperformed using the

a) minimum cost method.

b) MODI method.

c) stepping-stone method.

d) matrix reduction method.

Answer-: (c)

49. To use the transportation simplex method, a transportation problem that isunbalanced

requires the use of

a) artificial variables.

b) one or more transshipment nodes.

c) a dummy origin or destination.

d) matrix reduction.

Answer-: (c) a dummy origin or destination.

50. The problem which deals with the distribution of goods from several sources toseveral destinations is the

a) maximal flow problem

b) transportation problem

c) assignment problem

d) shortest-route problem

Answer-: (b)

51. The parts of a network that represent the origins are

a) the capacities

b) the flows

c) the nodes

d) the arcs

Answer-: (c)

52. The optimal solution is found in an assignment matrix when the minimum number ofstraight lines needed to cover all the zeros equals

a) (the number of agents) − 1.

b) (the number of agents).

c) (the number of agents) + 1.

d) (the number of agents) + (the number of tasks).

Answer-: (b)

53. The objective of the transportation problem is to

a) identify one origin that can satisfy total demand at the destinations and at the same time minimize total shipping cost.

b) minimize the number of origins used to satisfy total demand at the destinations.

c) minimize the number of shipments necessary to satisfy total demand at thedestinations.

d) minimize the cost of shipping products from several origins to severaldestinations.

Answer-: (d)

54. The MODI method is used to

a) identify an outgoing arc.

b) identify an incoming arc.

c) identify unoccupied cells.

d) identify an initial feasible solution.

Answer-:(b)

55. Which of the following is not true regarding the linear programming formulation ofa transportation problem?

a) Costs appear only in the objective function.

b) The number of variables is (number of origins) × (number of destinations).

c) The number of constraints is (number of origins) × (number ofdestinations).

d) The constraints' left-hand side coefficients are either 0 or 1.

Answer-: (c)

56. In the general linear programming model of the assignment problem,

a) one agent can do parts of several tasks.

b) one task can be done by several agents.

c) each agent is assigned to its own best task.

d) one agent is assigned to one and only one task.

Answer-: (d)

57. Which of the following is not true regarding an LP model of the assignment problem?]

a) Costs appear in the objective function only.

b) All constraints are of the ≥ form.

c) All constraint left-hand side coefficient values are 1.

d) All decision variable values are either 0 or 1.

Answer-: (b)

58. The assignment problem constraint $x_{31} + x_{32} + x_{33} + x_{34} \leq 2$ means

a) agent 3 can be assigned to 2 tasks.

b) agent 2 can be assigned to 3 tasks.

c) a mixture of agents 1, 2, 3, and 4 will be assigned to tasks.

d) there is no feasible solution.

Answer-: (a)

59. The assignment problem is a special case of the

a) transportation problem.

b) transshipment problem.

c) maximal flow problem.

d) shortest-route problem.

Answer-: (a)

60. The field of management science

a) concentrates on the use of quantitative methods to assist in decision making.

b) approaches decision making rationally, with techniques based on the scientific method.

c) is another name for decision science and for operations research.

d) each of the above is true.

Answer-: (d)

61. Identification and definition of a problem

a) cannot be done until alternatives are proposed.

b) is the first step of decision making.

c) is the final step of problem solving.

d) requires consideration of multiple criteria.

Answer-: (b)

62. The quantitative analysis approach requires

a) the manager's prior experience with a similar problem.

b) a relatively uncomplicated problem.

c) mathematical expressions for the relationships.

d) each of the above is true.

Answer-: (c)

63. Arcs in a transshipment problem

a) must connect every node to a transshipment node.

b) represent the cost of shipments.

c) indicate the direction of the flow.

d) All of the alternatives are correct.

Answer-: (c)

64. A physical model that does not have the same physical appearance as the objectbeing modeled is

a) an analog model.

b) an iconic model.

c) a mathematical model.

d) a qualitative model.

Answer-: (a)

65. Management science and operations research both involve

a) qualitative managerial skills.

b) quantitative approaches to decision making.

c) operational management skills.

d) scientific research as opposed to applications.

Answer-: (b)

66. George Dantzig is important in the history of management science because he developed

a) the scientific management revolution.

b) World War II operations research teams.

c) the simplex method for linear programming.

d) powerful digital computers.

Answer-: (c)

67. A model that uses a system of symbols to represent a problem is called

a) mathematical.

b) iconic.

c) analog.

d) constrained.

Answer-: (a)

68. The number of units shipped from origin i to destination j is represented by

a) x_{ij}.

b) x_{ji}.

c) c_{ij}.

d) c_{ji}.

Answer- a)

69. Which of the following special cases does not require reformulation of the problem inorder to obtain a solution?

a) alternate optimality

b) infeasibility

c) unboundedness

d) each case requires a reformulation.

Answer-: (a)

70. The range of feasibility measures

a) the right-hand-side values for which the objective function value will not change.

b) the right-hand-side values for which the values of the decision variables willnot change.

c) the right-hand-side values for which the dual prices will not change.

d) each of the above is true.

Answer-: (c)

71. The amount that the objective function coefficient of a decision variable would haveto improve before that variable would have a positive value in the solution is the

a) dual price.

b) surplus variable.

c) reduced cost.

d) upper limit.

Answer-: (c)

72. The values in the $c_j - z_j$, or net evaluation, row indicate

a) the value of the objective function.

b) the decrease in value of the objective function that will result if one unit of the variable corresponding to the jth column of the A matrix is brought into the basis.

c) the net change in the value of the objective function that will result if one unit of the variable corresponding to the jth column of the A matrix is brought into the basis.

d) the values of the decision variables.

Answer- : (c)

73. In the simplex method, a tableau is optimal only if all the $c_j - z_j$ values are

a) zero or negative.

b) zero.

c) negative and nonzero.

d) positive and nonzero.

Answer- : (a)

74. For the basic feasible solution to remain optimal

a) all $c_j - z_j$ values must remain ≤ 0.

b) no objective function coefficients are allowed to change.

c) the value of the objective function must not change.

d) each of the above is true.

Answer- : (a)

75. The dual variable represents

a) the marginal value of the constraint

b) the right-hand-side value of the constraint

c) the artificial variable

d) the technical coefficient of the constraint

Answer- : (a)

76. The parts of a network that represent the origins are

a) the axes

b) the flow

c) the nodes

d) the arrows

Answer- : (c)

77. The number of units shipped from origin i to destination j is represented by

a) x_{ij}.

b) x_{ji}.

c) c_{ij}.

d) c_{ji}.

Answer- : (a)

78. Slack

a) is the difference between the left and right sides of a constraint.

b) is the amount by which the left side of a $\leq$ constraint is smaller than the rightside.

c) is the amount by which the left side of a $\geq$ constraint is larger than the rightside.

d) exists for each variable in a linear programming problem.

Answer-: (b)

79. The difference between the transportation and assignment problems is that

a) total supply must equal total demand in the transportation problem

b) the number of origins must equal the number of destinations in thetransportation

problem

c) each supply and demand value is 1 in the assignment problem

d) there are many differences between the transportation and assignment problems

Answer- : (c)

80. The critical path

a) is any path that goes from the starting node to the completion node.

b) is a combination of all paths.

c) is the shortest path.

d) is the longest path.

Answer- : (d)

81. Operations research analysts do not

a) Predict future operations

b) Build more than one model

c) Collect relevant data

d) Recommend decision and accept

Answer- : (a)

82. Decision variables are

a) Controllable

b) Uncontrollable

c) Parameters

d) None of the above

Answer- : (a)

83. A model is

a) An essence of reality

b) An approximation

c) An idealization'

d) All of the above

Answer- :(d)

84. A physical model is an example of

a) An iconic model

b) An analogue model

c) A verbal model

d) A mathematical model

Answer- : (a)

85. Every mathematical model

a) Must be deterministic

b) Requires computer aid for solution.

c) Represents data in numerical form

d) All of the above

Answer- : (c)

86. Operations research approach is

a) Multi disciplinary

b) Scientific

c) Intuitive

d) All of the above

Answer- : (a)

87. In an assignment problem,

a) one agent can do parts of several tasks.

b) one task can be done by several agents.

c) each agent is assigned to its own best task.

d) None of the alternatives is correct.

Answer- : (d)

88. An optimization model

a) Mathematically provides best decision

b) Provides decision with limited context

c) Helps in evaluating various alternatives constantly

d) All of the above

Answer- : (d)

89. Operations research is applied

a) Military

b) Business

c) Administration'

d) All of the above

Answer- : (d)

90. Operations Research techniques helps to find..... solution

a) Feasible

b) Non feasible

c) Optimal

d) Non optimal

Answer- : (c)

91. OR provides solution only if the elements are

a) Quantified

b) Qualified

c) Feasible

d) Optimal

Answer- : (a)

92 Theory is an important operations research technique to analyze the queuing **behaviour.**

a) Waiting line

b) Net work

c) Decision

d) Simulation

Answer- : (a)

93 model involves all forms of diagrams

a) iconic

b) mathematical

c) analogue

d) schematic

Answer- : (a)

94 Is known as symbolic model

a) Iconic

b) Mathematical

c) Analogue

d) None of the above

Answer- : (b)

95. A map indicates roads, highways, towns and the interrelationship is an……model

a) Iconic

b) mathematical

c) analogue

d) none of the above

Answer- : (c)

96. Constraints in an LP model represent

a) Limitations

b) Requirements

c) Balancing limitation

d) all of the above

Answer- : (d)

97. Linear programming is a

a) Constraint optimization technique

b) Technique for economic allocation of limited resources.

c) Mathematical technique

d) all of the above

Answer- : (d)

98. A constraint in an LP model restricts

a) Value of objective function

b) Value of decision variable

c) Use of available resource

d) all of the above

Answer- : (d)

99 ..... is an important Operations research technique to be used for determining optimal allocation of limited resources to meet the given objectives.

a) Waiting line theory

b) Net work analysis

c) Decision analysis

d) Linear programming

Answer- : (d)

100. The best use of linear programming technique is to find an optimal use of

a) Money

b) Man power

c) Machine

d) all of the above

Answer- : (d)

101. Given the following table that presents the solution for a queuing problem witha constant service rate, on the average, how many customers are in the system?

M/D/1	
Mean Arrival Rate:	5 occurrences per minute
Constant Service Rate:	7 occurrences per minute
Solution:	
Mean Number of Units in the System:	1.607
Mean Number of Units in the Queue:	0.893
Mean Time in the System:	0.321 minutes
Mean Time In the Queue:	0.179 minutes
Service Facility Utilization Factor:	0.714

a) 0.893

b) 0.714

c) 1.607

d) 0.375

Answer-: (c)

102. Given the following table that presents the solution for a queuing problem with a constant service rate, on the average, how many minutes does a customer spend in the service facility?

M/D/1	
Mean Arrival Rate:	5 occurrences per minute
Constant Service Rate:	7 occurrences per minute
Solution:	
Mean Number of Units in the System:	1.607
Mean Number of Units in the Queue:	0.893
Mean Time in the System:	0.321 minutes
Mean Time In the Queue:	0.179 minutes
Service Facility Utilization Factor:	0.714

a) 0.893 minutes

b) 0.321 minutes

c) 0.714 minutes

d) 1.607 minutes

Answer-: (b)

103. Given the following table that presents the solution for a queuing problem witha constant service rate, what percentage of available service time is actually used?

M/D/1	
Mean Arrival Rate:	5 occurrences per minute
Constant Service Rate:	7 occurrences per minute
Solution:	
Mean Number of Units in the System:	1.607
Mean Number of Units in the Queue:	0.893
Mean Time in the System:	0.321 minutes
Mean Time In the Queue:	0.179 minutes
Service Facility Utilization Factor:	0.714

a) 0.217

b) 0.643

c) 0.321

d) none of the above

Answer-: (d)

104. Which of the following is usually the most difficult cost to determine?

a) service cost

b) facility cost

c) calling cost

d) waiting cost

Answer-: (d)

105. Given the following table that presents the solution for a queuing problem witha constant service rate, the probability that the server is idle is

M/D/1	
Mean Arrival Rate:	5 occurrences per minute
Constant Service Rate:	7 occurrences per minute
Solution:	
Mean Number of Units in the System:	1.607
Mean Number of Units in the Queue:	0.893
Mean Time in the System:	0.321 minutes
Mean Time In the Queue:	0.179 minutes
Service Facility Utilization Factor:	0.714

e) 0.217

f) 0.643

g) 0.286

h) 0.714

Answer-: (c)

106. Markov analysis is a technique that deals with the probabilities of future occurrences by

a) using Bayes' theorem.

b) analyzing presently known probabilities.

c) time series forecasting.

d) the maximal flow technique.

Answer-: (b)

107. Decision makers in queuing situations attempt to balance

i) operating characteristics against the arrival rate.

j) service levels against service cost.

k) the number of units in the system against the time in the system.

l) the service rate against the arrival rate.

Answer-: (b)

108. The manner in which units receive their service, such as FCFS, is the

m) queue discipline.

n) channel.

o) steady state.

p) operating characteristic.

Answer-: (a)

109. What queue discipline is assumed by the waiting line models presented in the textbook?

q) first-come first-served.

r) last-in first-out.

s) shortest processing time first.

t) No discipline is assumed.

Answer-: (a)

110. In Markov analysis, we are concerned with the probability that the

u) state is part of a system.

v) system is in a particular state at a given time.

w) time has reached a steady state.

x) transition will occur.

Answer-: (b)

111. For a situation with weekly dining at either an Italian or Mexican restaurant,

a) the weekly visit is the trial and the restaurant is the state.

b) the weekly visit is the state and the restaurant is thetrial.

c) the weekly visit is the trend and the restaurant is the transition.

d) the weekly visit is the transition and the restaurant is thetrend.

Answer-: (a)

112. A transition probability describes

a) the probability of a success in repeated, independent trials.

b) the probability a system in a particular state now will be in a specific state nextperiod.

c) the probability of reaching an absorbing state.

d) None of the alternatives is correct.

Answer-: (b)

113. Performance measures dealing with the number of units in line and the timespent waiting are called

y) queuing facts.

z) performance queues. **aa)**

system measures.

bb)operating characteristic.

Answer-: (d)

114. The probability of going from state 1 in period 2 to state 4 in period 3 is

a) p_{12}

b) p_{23}

c) p_{14}

d) p_{43}

Answer-: (c)

115. The probability that a system is in a particular state after a large number of periodsis

a) independent of the beginning state of the system.

b) dependent on the beginning state of the system.

c) equal to one half.

d) the same for every ending system.

Answer-: (a)

116. Analysis of a Markov process

a) describes future behavior of the system.

b) optimizes the system.

c) leads to higher order decision making.

d) All of the alternatives are true.

Answer-: (a)

117. If the probability of making a transition from a state is 0, then that state is called a(n)

a) steady state.

b) final state.

c) origin state.

d) absorbing state.

Answer-: d) absorbing state.

118. Absorbing state probabilities are the same as

a) steady state probabilities.

b) transition probabilities.

c) fundamental probabilities.

d) None of the alternatives is true.

Answer-: (d)

119. Markov analysis might be effectively used for

a) technology transfer studies.

b) university retention analysis.

c) accounts receivable analysis.

d) all of the above

Answer-: (d)

120. The following is not an assumption of Markov analysis.

a) There is an infinite number of possible states.

b) The probability of changing states remains the same over time.

c) (a) and (d)

d) We can predict any future state from the previous state and the matrix oftransition probabilities.

Answer-:(c)

121. The total cost for a waiting line does NOT specifically depend on

cc) the cost of waiting.

dd) the cost of service.

ee) the number of units in the system.

ff) the cost of a lost customer.

Answer-: (d)

122. Markov analysis assumes that conditions are both

a) complementary and collectively exhaustive.

b) collectively dependent and complementary.

c) collectively dependent and mutually exclusive.

d) collectively exhaustive and mutually exclusive.

Answer-: (d)

123. Occasionally, a state is entered which will not allow going to another state in the future.

This is called

a) an equilibrium state.

b) stable mobility.

c) market saturation.

d) none of the above

Answer-: (d)

124. Markov analysis is a technique that deals with the probabilities of future occurrences by

e) using Bayes' theorem.

f) analyzing presently known probabilities.

g) time series forecasting.

h) the maximal flow technique.

Answer-: (b)

125. In Markov analysis, the likelihood that any system will change from one period tothe next is revealed by the

a) identity matrix.

b) transition-elasticities.

c) matrix of state probabilities.

d) matrix of transition probabilities.

Answer-: (d)

126. The condition that a system can be in only one state at any point in time is known as

a) Transient state.

b) Absorbent condition.

c) Mutually exclusive condition.

d) Collectively exhaustive condition.

Answer-:(c)

127. At any period n, the state probabilities for the next period n+1 is given by thefollowing formula:

a) n(n+1)=n(n)Pn

b) n(n+1)=n(0)P

c) n(n+1)=(n+1)P

d) n(n+1)=n(n)P

Answer-: (d) n(n+1)=n(n)P

128. If we decide to use Markov analysis to study the transfer oftechnology,

a) our study will be methodologically flawed.

b) our study will have only limited value because the Markov analysis tells us "what"will happen, but not "why."

c) we can only study the transitions among three different technologies.

d) only constant changes in the matrix of transition probabilities can be handled inthe simple model.

Answer-: (b)

129. The following data consists of a matrix of transition probabilities (P) of three competing companies, the initial market share state 16_10.gif(1), and the equilibrium probability states. Assume that each state represents a firm (Company 1, Company 2, and Company 3, respectively) and the transition probabilities represent changes from one month to thenext.

$$\mathbf{P} = \begin{bmatrix} 0.1 & 0.6 & 0.3 \\ 0.7 & 0.1 & 0.2 \\ 0.2 & 0.2 & 0.6 \end{bmatrix} \quad \pi(1) = (0.3, 0.6, 0.1) \quad \pi_1 = 0.3168 \quad \pi_2 = 0.2970 \quad \pi_3 = 0.3862$$

The market share of Company 1 in the next period is

a) 0.10

b) 0.20

c) 0.42

d) 0.47

Answer-: (d)

130. Markov analysis assumes that the states are both_____and_____.

a) finite, recurrent

b) infinite, absorbing

c) generally inclusive, always independent

d) collectively exhaustive, mutually exclusive

Answer-: (d)

131. A simulation model uses the mathematical expressions and logical relationships ofthe

gg)real system.

hh)computer model.

ii) performance measures.

jj) estimated inferences.

Answer-: (a)

132. The_____determine(s) the equilibrium of a Markov process.

a) original state probabilities

b) state vector

c) transition matrix

d) fundamental matrix F

Answer-: (c)

133. Values for the probabilistic inputs to a simulation

a) are selected by the decision maker.

b) are controlled by the decision maker.

c) are randomly generated based on historical information.

d) are calculated by fixed mathematical formulas.

Answer-: (c)

134. A quantity that is difficult to measure with certainty is called a

a) risk analysis.

b) project determinant.

c) probabilistic input.

d) profit/loss process.

Answer-: (c)

135. A value for probabilistic input from a discrete probability distribution

a) is the value given by the RAND() function.

b) is given by matching the probabilistic input with an interval of random numbers.

c) is between 0 and 1.

d) must be non-negative.

Answer-: (b)

136. The number of units expected to be sold is uniformly distributed between 300 and 500.If r is a random number between 0 and 1, then the proper expression for sales is

a) 200(r)

b) r + 300

c) 300 +500(r)

d) 300 +r(200)

Answer-: (d)

137. Common features of simulations--generating values from probability distributions, maintaining records, recording data and summarizing results--led to the developmentof

a) Excel and Lotus.

b) BASIC, FORTRAN, PASCAL, and C.

c) GPSS, SIMSCRIPT, SLAM, and Arena

d) LINDO and The Management Scientist

Answer-: (c)

138. In order to verify a simulation model

a) compare results from several simulation languages.
b) be sure that the procedures for calculations are logically correct.
c) confirm that the model accurately represents the real system.
d) run the model long enough to overcome initial start-up results.

Answer-:(b)

Simulation

1. Simulation

a) does not guarantee optimality.
b) is flexible and does not require the assumptions of theoretical models.
c) allows testing of the system without affecting the real system.
d) All of the alternatives are correct.

Answer-: d) All of the alternatives are correct.

2. A simulation model used in situations where the state of the system at one point in time does not affect the state of the system at future points in time is called a

a) dynamic simulation model.
b) static simulation model.
c) steady-state simulation model.
d) discrete-event simulation model.

Answer-: b) static simulation model.

3. When events occur at discrete points in time

a) a simulation clock is required.
b) the simulation advances to the next event.
c) the model is a discrete-event simulation.

d) All of the alternatives are correct.

Answer-: d) All of the alternatives are correct.

4. The process of determining that the computer procedure that performs the simulation calculations is logically correct is called

   a) implementation.

   b) validation.

   c) verification.

   d) repetition.

Answer-: c) verification.

5. Numerical values that appear in the mathematical relationships of a model and are considered known and remain constant over all trials of a simulation are

   a) parameters.

   b) probabilistic input.

   c) controllable input.

   d) events.

Answer-: a) parameters.

6. The word "uniform" in the term "uniform random numbers" means

   a) all the numbers have the same number of digits.

   b) if one number is, say, 10 units above the mean, the next number will be 10 units below the mean.

   c) all the numbers are odd or all are even.

   d) each number has an equal probability of being drawn.

Answer-: d) each number has an equal probability of being drawn.

7. The first step in simulation is to
   a) set up possible courses of action for testing.
   b) construct a numerical model.
   c) validate the model.
   d) define the problem.

Answer-: d) define the problem.

8. Which of the following are disadvantages of simulation?
   a) inability to analyze large and complex real-world situations
   b) "time compression" capability
   c) could be disruptive by interfering with the real-world system
   d) is not usually easily transferable to other problems

Answer-: d) is not usually easily transferable to other problems

9. Cumulative probabilities are found by
   a) summing all the probabilities associated with a variable.
   b) simulating the initial probability distribution.
   c) summing all the previous probabilities up to the current value of the variable.
   d) any method one chooses.

Answer-: c) summing all the previous probabilities up to the current value of the variable.

10. Which of the following statements is INCORRECT regarding the advantages ofsimulation?
    a) Simulation is relatively easy to explain and understand.
    b) Simulation guarantees an optimal solution.

c) Simulation models are flexible.

d) A simulation model provides a convenient experimental laboratory for the real system.

Answer-: b) Simulation guarantees an optimal solution.

11. If we are going to simulate an inventory problem, we must

a) Run the simulation for many days.

b) Run the simulation for many days many times, i.e., using multiple sets of random numbers.

c) Run the simulation many times, i.e., using multiple sets of random numbers.

d) Run the simulation once, for a relative short period of time.

Answer-: b) run the simulation for many days many times, i.e., using multiple sets of random numbers.

12. Simulation should be thought of as a technique for

a) obtaining a relatively inexpensive solution to a problem.

b) increasing one's understanding of a problem.

c) obtaining an optimal solution to a problem.

d) providing quick and dirty answers to complex problems.

Answer-: b) increasing one's understanding of a problem.

13. In assigning random numbers in a Monte Carlo simulation, it is important to_____.

a) develop cumulative probability distributions

b) use random numbers from a random number table

c) use only a single set of random numbers

d) use Excel spreadsheets

Answer-:a) develop cumulative probability distributions

14. To simulate is to try to_____the features, appearance, and characteristics of a real system.

a) Develop

b) Analyze

c) Multiply

d) Duplicate

Answer-:d) Duplicate

15. The three types of mathematical simulation models are

a) operational gaming, Monte Carlo, systems simulation

b) Monte Carlo, queuing, maintenance policy.

c) Monte Carlo, systems simulation, computer gaming.

d) system simulation, operational gaming, weather forecasting.

Answer-: a) operational gaming, Monte Carlo, systems simulation

16. Which of the following as an assumption of an LP model

a) Divisibility

b) Proportionality

c) Additively

d) all of the above

Answer- : d)

17. Most of the constraints in the linear programming problem are expressed as…….

a) Equality

b) Inequality

c) Uncertain

d) all of the above

Answer- : b)

18. A feasible solution to a linear programming problem

a) Must satisfy all problem constraints simultaneously

b) Need not satisfy all constraints

c) Must be a corner point of the feasible region

d) Must optimize the value of the objective function

Answer- : a)

19. While plotting constraints on a graph paper, terminal points on both axes are connected bya straight line because

a) The resources are limited in supply

b) The objective function is a linear function

c) The constraints are linear equations or in equalities

d) all of the above

Answer- : c)

20. Constraints in LP problem are called active if they

a) Represent optimal solution

b) At optimality do not consume all the available resources

c) Both of (a) and (b)

d) None of the above

Answer- : a)

21. The solution space of a LP problem is unbounded due to

a) An incorrect formulation of the LP model

b) Objective function is unbounded

c) Neither (a) nor (b)

d) Both (a) and (b)

Answer- : c)

22. The graphical method of LP problem uses

a) Objective function equation
b) Constraint equation
c) Linear equations
d) All the above

Answer- : d)

23. While solving LP problem graphically, the area bounded by the constraints is called

a) Feasible region
b) Infeasible region
c) Unbounded solution
d) None of the above

Answer- : a)

24. Which of the following is not a category of linear programming problems?

a) Resource allocation problem
b) Cost benefit trade off problem
c) Distribution network problem
d) All of the above are categories of linear programming problems.

Answer- : d)

25. Which of the following may not be in a linear programming formulation?

a) <=.
b) >.
c) =.

d) All the above

Answer- : b)

26. While solving an LP problem infeasibility may be removed by

a) Adding another constraint

b) Adding another variable

c) Removing a constraint

d) Removing a variable

Answer- : c)

27. A linear programming model does not contain which of the following components?

a) Data

b) Decisions

c) Constraints

d) A spread sheet

Answer- : d)

28. Straight lines shown in a linear programming graph indicates

a) Objective function

b) Constraints

c) Points

d) All the above

Answer- : b)

29. In linear programming problem if all constraints are less than or equal to, then the feasible region is

a) Above lines

b) Below the lines

c) Unbounded

d) None of the above

Answer- : b)

30 is a series of related activities which result in some product or services.

Network

transportation model

a) assignment

b) none of these

Answer- : a)

31. Any activity which does not consume either any resource or time is called

…….activity.

a) Predecessor

b) Successor

c) Dummy

d) End

Answer- : c)

32. All negative constraints must be written as

a) Equality

b) Non equality

c) Greater than or equal to

d) Less than or equal to

Answer- : c)

33. Activities that cannot be started until one or more of the other activities are completed, but immediately succeed them are called ……activities

a) Predecessor

b) Successor

c) Dummy

d) End

Answer- : b)

34. An event which represents the beginning of more than one activity is knownas

…….event.

a) Merge

b) Net

c) Burst

d) None of the above

Answer- : c)

35. If two constraints do not intersect in the positive quadrant of the graph, then

a) The problem is infeasible

b) The solution is unbounded

c) One of the constraints is redundant

d) None of the above

Answer- : d)

36. An activity which must be completed before one or more other activities start is known as

…….activity.

a) Predecessor

b) Successor

c) Dummy

d) End

Answer- : a)

37. Constraint in LP problem are called active if they

a) Represent optimal solution

b) At optimality do not consume all the available resources

c) Both of (a) and (b)

d) None of the above

Answer- : a)

38. While solving an LP problem, infeasibility may be removed by

a) Adding another constraint

b) Adding another variable

c) Removing a constraint

d) Removing a variable

Answer- : c)

39 ..... is that sequence of activities which determines the total project time.

a) Net work

b) Critical path

c) Critical activities

d) None of the above

Answer- : b)

40. Activities lying on the critical path are called.....

a) Net work

b) Critical path

c) Critical activities

d) None of the above

Answer- : c)

41 models in which the input and output variables follow a probability distribution.

a) Iconic

b) mathematical

c) analogue

d) Deterministic model

Answer- : d)

42 Example of probabilistic model

a) Game theory

b) Charts

c) Graphs

d) All the above

Answer- : a)

43. Alternative solutions exists of an LP model when

a) One of the constraints is redundant.

b) Objective function equation is parallel to one of the constraints

c) Two constraints are parallel.

d) all of the above

Answer- : b)

44 is a method of analyzing the current movement of the same variable in an effort to Predict the future movement of the same variable.

a) Goal programming

b) Markov analysis

c) Replacement theory

d) Queuing theory

Answer- : b)