Chapter-1: Quantitative Techniques

Self Assessment Questions

1. The use of past data in a systematic manner and constructing it into a suitable model for future use comprises a major part of…………………….
   a. scientific management
   b. marketing
   c. systematic
   d. None of these.

2. The expected return on investments will vary depending upon the interest and....................
   a. quantitative
   b. time period
   c. business decision
   d. None of these.

3. One part of the answer is………………, and experience in interpreting information.
   a. good information
   b. management information
   c. marketing
   d. None of these.

4. …………………..increasingly happens at all levels of a business.
   a. Decision-making
   b. Quantitative techniques
   c. marketing
   d. None of these.

5. The study found that decisions about ……………..are often made on the basis of very limited knowledge about the facts of a situation.
   a. intervention
   b. quantitative techniques
   c. business decision
   d. None of these.

6. A related observation which is often heard is that the better the data quality, the more obscure and complex is the………………………….
   a. inventory control
   b. Planning
7. Finance and Accounting is a Cash flow analysis, Capital budgeting, Dividend and Portfolio management, Financial planning.
   a. True
   b. False.

8. The.......................guaranties that are represented through these variables are notified.
   a. measurable
   b. marketing
   c. measurement
   d. None of these.

9. A.......................is a complete test of the model to confirm that it provides an accurate representation of the real problem.
   a. validation
   b. translation
   c. modification
   d. None of these.

10. A matrix is not a collection of numbers ordered by rows and columns.
    a. True
    b. False.

11. Which research paradigm is based on the pragmatic view of reality?
    a. quantitative research
    b. qualitative research
    c. mixed research
    d. none of the above

12. Which research paradigm is least concerned about generalizing its findings?
    a. quantitative research
    b. qualitative research
    c. mixed research
    d. none of the above
13. Which of the following best describes quantitative research?

   a. the collection of nonnumerical data  
   b. an attempt to confirm the researcher’s hypotheses  
   c. research that is exploratory  
   d. research that attempts to generate a new theory

14. A condition or characteristic that can take on different values or categories is called ____.

   a. a constant  
   b. a variable  
   c. a cause-and-effect relationship  
   d. a descriptive relationship

15. A variable that is presumed to cause a change in another variable is called a(n):

   a. categorical variable  
   b. dependent variable  
   c. independent variable  
   d. intervening variable

16. All of the following are common characteristics of experimental research except:

   a. it relies primarily on the collection of numerical data  
   b. it can produce important knowledge about cause and effect  
   c. it uses the deductive scientific method  
   d. it rarely is conducted in a controlled setting or environment

17. Qualitative research is often exploratory and has all of the following characteristics except:

   a. it is typically used when a great deal is already known about the topic of interest  
   b. it relies on the collection of nonnumerical data such as words and pictures  
   c. it is used to generate hypotheses and develop theory about phenomena in the world  
   d. it uses the inductive scientific method
18. Which type of research provides the strongest evidence about the existence of cause-and-effect relationships?
   a. nonexperimental Research
   b. experimental Research
   a. both (a) and (b)
   b. all of above

19. What is the key defining characteristic of experimental research?
   a. extraneous variables are never present
   b. a positive correlation usually exists
   c. a negative correlation usually exists
   d. manipulation of the independent variable

20. In _____, random assignment to groups is never possible and the researcher cannot
    manipulate the independent variable.
   a. basic research
   b. quantitative research
   c. experimental research
   d. causal-comparative and correlational research

**Answers of Self Assessment Questions**

1. (a)  2. (b)  3. (a)  4. (a)  5. (a)
6. (c)  7. (a)  8. (a)  9. (a)  10. (b)
11. (c) 12. (b) 13. (b) 14. (b) 15. (c)
16. (d) 17. (a) 18. (b) 19. (d) 20. (d)
Chapter-2 Probability

Self Assessment Questions

1. If an executive is picked at random, find the probability that he or she reads both the Financial Times and the Economist.
   a. 0.333
   b. 0.666
   c. 0.833
   d. 0.5

2. If an executive is picked at random find the probability that he or she reads either the Financial Times or the Economist.
   a. 1.000
   b. 0.833
   c. 0.166
   d. 0.500

3. If an executive is selected at random what is the probability that they read either the Financial Times or the Economist but not both.
   a. 0.500
   b. 0.166
   c. 0.333
   d. 0.833

4. Use Bayes' theorem to solve the following two questions.

Zip fit Tyre Company stocks three brands of tyre: brand A; brand B and brand C. 40% are Brand A, 35% are brand B and 25% are brand C. The percentage of defective tyres are 2% of brand A, 1% of brand B and 3% of brand C. If a tyre is picked at random what is the probability that it is defective?
   a. 0.075
   b. 0.019
   c. 0.366
   d. 0.060
5. If the company selects a tyre and finds it defective find the probability that it is a brand C tyre.
   
a. 0.123  
b. 0.425  
c. 0.148  
d. 0.395

6. A workforce consists of seven workers. How many different three worker teams is it possible to select?
   
a. 210  
b. 35  
c. 125  
d. 70

7. Two prize-winners are to be selected from ten economics students. In how many different ways could the prize-winners be selected?
   
a. 24  
b. 90  
c. 36  
d. 45

8. If the two prizes in the previous question are designated first and second prize, in how many different ways could they be awarded?
   
a. 36  
b. 24  
c. 45  
d. 90

9. In the UK lottery seven balls are selected out of forty-nine. So far 572 draws have been made (correct at the time of writing). How many times would you expect a particular number to have been drawn?
10. A company plans to sell a new product at £5 per unit. Variable costs per unit may be £1 (with a probability of 0.75) or £1.20. Fixed costs per week are £2000 and demand per week may be 700 units (probability 0.6) or 1100 units. What is the expected weekly profit assuming that production is adjusted to demand?

a. £1480
b. £1564
c. £1397
d. £1646

11. Definitional approaches are most commonly used by risk practitioners, but there are several issues affecting their effectiveness.

a. True
b. False

12. The aim of all these techniques is to adjust the comparator until the assessor can distinguish between the risk probability and the value being presented.

a. True
b. False

13. The assessor is asked what odds they would give on the risk occurring (though the response is affected by the individual’s utility curve, which must be known if the wager is to be properly interpreted).

a. Wagers
b. Relative Likelihood
c. Value-Oriented
d. All of these

14. The state of nature approach also allows comparison of exposure to risk from a given common source across related projects (for example in a portfolio), and facilitates learning from previous experience since “states of nature” can be constructed based on past project performance.
15. Probability has a popular meaning that is not the same as the mathematical meaning.
   a. True
   b. False

16. The classical approach to using probability depends on .................events that are equally likely to happen.
   a. Many futures
   b. Several futures
   c. Lots of futures
   d. None of these

17. ................. uses the past to make predictions about the future.
   a. Relative Frequency Approach
   b. Classical Approach in Business
   c. Frequency Approach in Business
   d. None of these

18. A binomial distribution summarizes the number of trials, or observations, when each trial has the same probability of attaining one particular value.
   a. True
   b. False

19. The .................is used for sampling plans involving the number of defects or defects per unit rather than the number of defective parts.
   a. Poisson distribution
   b. Normal distribution

20. Bayesian probability’s application in corporate America is highly dependent on the “degree of belief” rather than historical frequencies of identical or similar events.
   a. True
   b. False

**Answers for Self Assessment Questions**
1. (a)  2.(b)  3.(a)  4.(b)  5.(d)
Chapter-3: Research in Business

Self Assessment Questions

1. What is distinctive about "Mode 2" knowledge production?
   a. It proceeds in a linear fashion building on existing knowledge.
   b. It is driven primarily by an academic agenda.
   c. It involves academics, policy makers and practitioners in problem solving.
   d. It places limited emphasis on the practical dissemination of knowledge.

2. Which of the following is not an example of a middle-range theory?
   a. Labour process theory
   b. Contingency theory
   c. Strategic choice
   d. Structuration

3. An inductive theory is one that:
   a. involves testing an explicitly defined hypothesis.
   b. does not allow for findings to feed back into the stock of knowledge.
   c. uses quantitative methods whenever possible.
   d. allows theory to emerge out of the data.

4. What is the epistemological position held by a positivist?
   a. There is no substitute for an in-depth, hermeneutic understanding of society.
   b. Scientific research should be based on value-free, empirical observations.
   c. Events and discourses in the social world prevent us from having direct knowledge of the natural order.
   d. It is important to remain optimistic about our research, even when things go wrong.

5. An interpretivist perspective on the issue of leadership suggests that:
   a. 'good' leadership can be measured.
   b. leaders are born and not made.
   c. it is a construct that is used to make sense of social action.
   d. all leaders act in the same way regardless of context.
6. Which of the following is an ontological question?
   a. Should I use questionnaires or interviews in my project?
   b. What can (and should) be considered acceptable forms of knowledge?
   c. How long is it since I last visited the dentist?
   d. Do social entities have an objective reality, external to social actors?

7. The constructionist ontological position suggests that:
   a. social phenomena and their meanings are constantly being accomplished by social actors.
   b. individuals are born into a world of rules and structures that they cannot change.
   c. building and construction work presents an ideal opportunity to exercise the sociological imagination.
   d. social facts and objects have an external reality, independently of the people who perceive them.

8. According to Burrell & Morgan (1979) which one of the following is not a paradigm within business research methods?
   a. Radical structuralist
   b. Radical positivist
   c. Functionalist
   d. Interpretative

9. Quantitative research is:
   a. more likely to take a deductive approach.
   b. more likely to take an objectivist ontological position.
   c. more likely to be informed by a positivist epistemological position.
   d. all of the above.

10. Qualitative research strategy places a value on:
    a. using numbers, measurements and statistical techniques.
    b. generating theories through inductive research about social meanings.
c. conducting research that is of a very high quality.

d. all of the above.

11. Which of the following does a research proposal not attempt to communicate?

a. purpose of the intended study
b. results of the study, along with a discussion about them
c. importance of the intended study
d. step-by-step plan for conducting the study

12. Which section of a research proposal describes succinctly what the research proposes to investigate?

a. purpose of the study
b. justification of the study
c. research question
d. definition of terms

3. In which section of a research proposal must researchers make clear why this particular subject is important to investigate?

a. the research question
b. definition of terms
c. justification of the study
d. purpose of the study

4. In which section of a research proposal must researchers state the particular question to be investigated?

a. justification of the study
b. research question
c. definition of terms
d. purpose of the study

5. Which is not a question to ask when evaluating a research report?

a. Were the instruments valid for the purpose?
b. Was the sample representative of the intended population?
c. Was the procedure clear enough to be reproduced?
d. Was it published in an important journal?

6. Which section of a research report is not contained in a research proposal?
   a. justification of the study
   b. research question
   c. results and discussion about them
   d. purpose of the study

7. The essential difference between a research proposal and a research report is that
   a. a research report states what was done rather than what will be done and includes the actual results of the study.
   b. a research report states the research question.
   c. a research report states the purpose of the study.
   d. all of these

8. Discussion of internal validity is found in which section of a research proposal?
   a. procedures
   b. budget
   c. results and findings
   d. key terms

9. Discussion of results and findings is found in which section of a research proposal?
   a. budget
   b. procedures
   c. conclusions
   d. none of these

10. Which statement does not apply to the "discussion" section of a report?
    a. It should be consistent with the study results.
    b. It should not go beyond the study results.
c. It should generally be distinct from the results.
d. In qualitative studies, keeping it distinct from results is difficult.

Answers for Self Assessment Questions

1. (c)  2. (d)  3. (d)  4. (c)  5. (c)
6. (d)  7. (a)  8. (b)  9. (d)  10. (b)
11(b)  12.(a)  13.(c)  14.(b)  15.(d)
16.(a)  17.(a)  18.(a)  19.(d)  20.(b)
Chapter-4: Application of Differentiation and Integration

Self Assessment Questions

1. An example of a production overhead would be:
   a. Supervisory costs
   b. Materials
   c. Rent
   d. Labour costs

2. Absorption costing is closely related to which of the following cost elements?
   a. Total costs
   b. Prime costs
   c. Overheads
   d. Direct labour

3. Which of the following would not be classed as a service department?
   a. The finance department
   b. The canteen
   c. The maintenance department
   d. The assembly department

4. Cost apportionment involves:
   a. The sharing out of overheads to service departments
   b. The allocation of direct costs to departments
   c. The sharing out of common costs to departments
   d. The sharing out of costs to products

5. Which of the following would be an inappropriate method of apportioning service department costs?
   a. Apportioning on the basis of number of employees
   b. Apportioning on the basis of floor area
   c. Apportioning on the basis of service department activity
   d. Sharing costs out equally between departments
6. Which of the following is an unsatisfactory method of dealing with reciprocal service costs?
   a. Apportion the service costs over production departments only
   b. Ignore the service department costs
   c. Use a specified order of apportioning service department costs
   d. Use mathematical apportionment techniques

7. The most appropriate method of apportioning the rent of a building would be:
   a. On the basis of area of each department
   b. On the basis of value of assets
   c. To share them out equally amongst all departments
   d. On the basis of number of employees

8. Absorption costing refers to the process of:
   a. Absorbing only production service cost centre costs into product costs
   b. Absorbing direct costs of production into products
   c. Absorbing the direct costs of production and service departments into products
   d. Absorbing both production and non-production service cost centre costs into product costs

9. Which of the following would not normally be a suitable method of absorbing costs into products?
   a. Total cost centre overhead / Number of employees
   b. Total cost centre overhead / Total cost centre direct labour cost
   c. Total cost centre overhead / Number of units processed in department
   d. Total cost centre overhead / Cost centre total machine hours

10. Profit-maximising firms want to maximize the difference between:
    a. total revenue and total cost.
    b. marginal revenue and average cost.
    c. total revenue and marginal cost.
d. marginal revenue and marginal cost.

11. Which statement is FALSE?
   a. Fixed costs are the difference between total costs and total variable costs.
   b. Fixed costs do not depend on the firm's level of output.
   c. There are no fixed costs in the long run.
   d. Fixed costs are zero if the firm is producing nothing.

12. Which of the following is most likely to be a variable cost for a firm?
   a. The monthly rent on office space that it leased for a year.
   b. The payroll taxes that are paid on employee wages.
   c. The franchiser's fee that a restaurant must pay to the national restaurant chain.
   d. The interest payments made on loans.

13. The costs that depend on output in the short run are:
   a. total variable costs only.
   b. total fixed cost only.
   c. total costs only.
   d. both total variable costs and total costs.

14. The short run, as economists use the phrase, is characterised by:
   a. all inputs being variable.
   b. a period where the law of diminishing returns does not hold.
   c. at least one fixed factor of production and firms neither leaving nor entering the industry.
   d. no variable inputs - that is, all of the factors of production are fixed.

15. Diminishing marginal returns implies:
   a. increasing marginal costs.
   b. decreasing average variable costs.
   c. decreasing average fixed costs.
   d. decreasing marginal costs.
16. Which of the following is a correct statement about the relationship between average product (AP) and marginal product (MP)?

a. If AP = MP, then total product is at a maximum.
b. If AP is at a maximum, then MP is also.
c. If AP exceeds MP, then AP is falling.
d. If TP is declining, then AP is negative.

17. If the total product of two workers is 80 and the total product of 3 workers is 90, then the average product of the third worker is _____ and the marginal product of the third worker is ______.

a. 10; 3.33
b. 160; 270
c. 10; 30
d. 30; 10

18. Engineers for The All-Terrain Bike Company have determined that a 15% increase in all inputs will cause a 15% increase in output. Assuming that input prices remain constant, you correctly deduce that such a change will cause ______ as output increases.

a. marginal costs to increase
b. average costs to increase
c. average costs to decrease
d. average costs to remain constant

19. Suppose Handel’s Ice Cream experiences economies of scale up to a certain point and diseconomies of scale beyond that point. Its long-run average cost curve is most likely to be:

a. horizontal.
b. upward sloping to the right.
c. downward sloping to the right.
d. U-shaped.

20. Most empirical studies show that firms’ cost curves:
a. slope down to the right and then level off.
b. slope up to the right.
c. slope down to the right.
d. are U-shaped.

Answers for Self Assessment Questions

1. (a) 2. (c) 3. (d) 4. (c) 5. (d)
6. (b) 7. (a) 8. (a) 9. (a) 10. (a)
11(d) 12.(b) 13.(d) 14.(c) 15.(a)
16.(c) 17.(d) 18.(d) 19.(d) 20.(a)
Chapter-5: Decision Theory

Self Assessment Questions

1. Probability is the branch of ……………that studies the possible outcomes of given events together with the outcomes’ relative likelihoods and distributions.
   a. mathematics
   b. science
   c. chemistry
   d. physic

2. A variate is defined as the set of all random variables.
   a. True
   b. False

3. Probabilities are defined to obey certain assumptions, called the ………………
   a. probabilities distributions
   b. probability axioms
   c. distribution function
   d. None of these.

4. Statistical ……………tests are often based on specific distributional assumptions.
   a. intervals
   b. hypothesis
   c. Both (a) and (b)
   d. None of these.

5. ……………….refers to the probability that the value of a random variable falls within a specified range.
   a. Probabilities distributions
   b. Cumulative probability
   c. Probability axioms
   d. Distribution function

6. ………………. is essential to modern digital communication theory.
   a. Statistical decision theory
   b. Economics decision theory
   c. Psychology decision theory
   d. All of these.
7. Binary measure divides the probability values into........groups.
   a. one
   b. two
   c. three
   d. four

8. Fuzziness is a non-statistical concept.
   a. True
   b. False

9. .......... monetary value is a value based on probability that factors in all possible monetary outcomes of a given situation.
   a. Expected
   b. Unexpected
   c. Constant
   d. None of these.

10. Expected Monetary Value is a recommended tool and technique for quantitative risk analysis in project........
    a. human management
    b. marketing management
    c. risk management
    d. finance management

11. If the last of the .................states is realized, the outcome is the same for A and B.
    a. three
    b. two
    c. one
    d. None of these.

12. The deviations from the predictions of the theorem are not random and........... but systematic.
    a. arbitrary
    b. random
    c. Both (a) and (b)
    d. None of these.
13. A ………………..specifies the probable value of different alternatives, depending on different possible outcomes associated with each.

   a. probability
   b. payoff matrix
   c. judgment
   d. None of these.

14. The most widely used decision making criteria under risk is …………………

   a. expected value
   b. monetary value
   c. payoff matrices
   d. None of these.

15. Game theory is the formal study of …………………

   a. conflict
   b. cooperation
   c. Both (a) and (b)
   d. None of these.

16. At the end of the……………… a high-profile application of game theory has been the design of auctions.

   a. 1990
   b. 1970
   c. 1985
   d. None of these.

17. The………………….and mathematical foundations of game theory make it a prime tool for modeling and designing automated decision-making processes in interactive environments.

   a. externalal
   b. internal consistency
   c. intra consistency
   d. None of these.

18. As a mathematical tool for the decision-maker the strength of ……………is the methodology it provides for structuring and analyzing problems of strategic choice.

   a. assessment problem
   b. game theory
   c. decision tree
d. None of these.

19. The problem of finding an optimal strategy in a differential game is closely related to the………………..
   a. optimal control theory
   b. optimal strategy
   c. dynamic programming
   d. None of these.

20. The theory of…………….is related to mechanism design theory.
   a. meta games
   b. confrontation analysis
   c. Both (a) and (b)
   d. None of these.

Answers for Self Assessment Questions

1. (a) 2 (a) 3 (b) 4 (d) 5 (b)
6 (a) 7 (b) 8 (a) 9 (a) 10 (c)
11. (a) 12. (a) 13. (b) 14. (a) 15. (c)
16. (a) 17. (b) 18. (b) 9. (a) 20. (a)
Chapter-6: Expected Value of Perfect Information

Self Assessment Questions

1. ……… is the difference between the expected value with perfect information and the expected value with current information.
   a. EPIV
   b. EVPI
   c. EVIP
   d. EPVI

2. ……… is a technique used to assist decision making by assessing the impact of small or marginal changes.
   a. Incremental analysis
   b. Account analysis
   c. Cost analysis
   d. Decremented analysis

3. Managers typically make decisions by selecting between at least …….alternatives.
   a. four
   b. three
   c. two
   d. one

4. A correlation of …….. means there is no relationship between…………variables.
   a. Zero
   b. one
   c. two
   d. three

5. Prediction or estimation is one of the major problems in almost all the ……….of human activity.
   a. circles
   b. spheres
c. triangles

d. All of these.

6. The concept of Derivative is at the ............

a. core of Calculus
b. modern mathematics
c. Both (a) and (b)
d. None of these.

7. Incremental analysis is applicable to both short- and long-run issues, but is particularly suited to short-run decisions.

a. True
b. False

8. The extreme value theorem guarantees ............... value for a function under certain conditions.

a. maximum
b. minimum
c. Both (a) and (b)
d. None of these.

9. Incremental analysis is sometimes referred to as ............... 

a. incremental cost analysis
b. relevant cost analysis
c. differential cost analysis
d. All of these.

10. ............... is defined as the process of calculating derivatives.

a. Differentiation
b. Integration
c. Multiplication
d. All of these.
11. The expected value of perfect information is calculated by subtracting:
   a. EVSI from the expected return with perfect information.
   b. the maximum EMV from the minimum expected opportunity loss.
   c. the minimum expected opportunity loss from the expected opportunity loss with perfect information.
   d. the maximum EMV from the expected return with perfect information.

12. The maximin criterion is a feature of which of the following?
   a. Deterministic model
   b. Optimization
   c. Decision-making under certainty
   d. Decision-making under uncertainty

13. In order to use Bayes' Theorem to calculate the P(A/B), it is necessary to know which of the following:
   a. P(B) and P(B/A)
   b. P(A) and P(B/A)
   c. P(A) and P(B)
   d. P(A), P(B), and P(B/A)

14. The EVSI is always:
   a. non-negative.
   b. equal to the minimum EOL.
   c. greater than the EVPI.
   d. smaller than the expected value of the best decision without sample information.

15. Which of the following statements is true?
   a. Prior probabilities are probability estimates after a test market.
   b. Maximin, maximax, and minimax regret criterion all lead to the same optimal decision.
   c. The maximax criterion is a conservative approach to decision making.
d. Someone who is indifferent to risk would have a utility function that is a straight line.

16. When making a decision under risk, which of the following is a valid decision-making criterion?
   a. Maximax
   b. Minimax regret
   c. Maximin
   d. Minimize expected opportunity loss

17. Which of the following occurs in decision making under uncertainty?
   a. Exactly one state of nature.
   b. Equally likely probabilities for all states of nature.
   c. A payoff table for each possible combination of decisions and outcomes.
   d. Conditional probabilities.

18. Which of the following statements is true?
   a. A decision tree usually begins with a decision node.
   b. Payoff tables will always contain positive numbers.
   c. If the increase in a decision maker’s utility for a profit of $5,000 is the same as the decrease in that decision maker’s utility for a loss of $5,000, then that decision maker is said to be risk averse.
   d. The EVPI can be determined without using probabilities.

19. A joint probability is:
   a. P(B/A).
   b. P(A/B).
   c. P(A and B).
   d. P(B).

20. Sheri has a utility of 1 for one million dollars, 0.8 for half a million dollars, 0.5 for $0 and 0 for a loss of $200,000. Sheri states that she is indifferent between receiving $500,000 for
certain, and a gamble with 0.6 probability of winning $250 000 and 0.4 probability of winning one million dollars. What is her utility for $250 000?

a. 0.667  
b. 0.750  
c. 0.333  
d. 0.500

Answers for Self Assessment Questions

1. (b)  2 (a)  3 (c)  4 (a)  5 (b)  
6 (c)  7 (a)  8 (c)  9 (d)  10 (a)  
11. (d)  12. (d)  13. (d)  14. (a)  15. (d)  
16. (d)  17. (c)  18. (a)  9. (c)  20. (a)
Chapter-7: Transportation and Assignment Problems

Self Assessment Questions

1. The peculiarity of the assignment problem is ………job can be assigned to ………….. machine.
   a. One, two
   b. Two, one
   c. One, one
   d. two, two

2. The cost data is given as a matrix where ……… correspond to jobs and ………….. to machines
   a. Rows, columns
   b. columns, rows
   c. Row, row
   d. All of these.

3. Assignment becomes a problem because each job requires …………. skills and the capacity.
   a. Same
   b. many
   c. different
   d. None of these.

4. The transportation problem is a special class of the linear programming problem
   a. True
   b. False

5. Transportation problem deals with the situation in which a commodity is transported from Destination to source
   a. True
   b. False

6. The objective of assignment problem is to maximize the total cost of doing all the jobs on different machines.
   a. True
   b. False

7. The objective is to determine the amount of commodity to be transported from each source to each destination so that the total transportation cost is …………………
8. To find an initial basic feasible solution we apply:
   a. The north-west corner rule
   b. v ogel’s approximation method.
   c. Only (a)
   d. (a) and (b) both

9. The transportation problem is known as an unbalanced transportation problem.
   a. True
   b. False

10. Transportation with m-origins and n-destinations can have m+n-1 positive basic variables.
    a. True
    b. False

11. Due to the differences in structure of the variants of the problem, the assignment problem with strict and loose capacity constraints.
    a. two
    b. three
    c. one
    d. None of these.

12. The most obvious approach to solving the constrained assignment problem, the problem to the minimum.
    a. cost flow problem
    b. assignment problems
    c. minimum cost flow
    d. None of these.

13. The case of the, the special structure of the input network can help to find substantially faster algorithms.
    a. assignment problem
    b. minimum cost flow
    c. maximum cost flow
14. The………..problem as a min-cost circulation problem on a bipartite network and thus make use of this algorithm.
   a. assignment problem
   b. constrained assignment
   c. Both (a) and (b)
   d. None of these.

15. The resulting network is bipartite, and a minimum cost circulation on this network corresponds to an optimal solution of the…………………………
   a. optimal solution
   b. constrained assignment problem.
   c. multiple optimal solution
   d. None of these.

16. The transform the underlying…………….to a symmetric one by adding additional virtual nodes X’.
   a. asymmetric assignment problem
   b. symmetric assignment problem
   c. Both (a) and (b)
   d. None of these.

17. The……………….conditions require the price value for the terminal node π (t) simply to be lower or equal to each of the values π (zi).
   a. node π (t2)
   b. node π (t)
   c. complementary slackness
   d. None of these.

18. One possible way to solve the problem is to always keep the prices of unassigned nodes in Yk below k and the prices of assigned nodes above or equal to k, and to keep only………………in the heap.
   a. assigned nodes
   b. assignment problem
   c. transportation
   d. None of these.
19. In the first step cost differences are calculated and the largest one, 9, is selected
and……………..are placed in the cell 5-A.

   a.  100 units
   b.  50 units
   c.  80 units
   d.  None of these.

20. The………………objective strictly increases, and we used this to derive the fact that the
algorithm is finite.

   a.  dual
   b.  assigned nodes
   c.  assignment problem
   d.  None of these.

Answers of Self Assessment Questions

1. (c)  2. (a)  3. (c)  4. (a)  5. (b)  
6. (b)  7. (b)  8. (d)  9. (a)  10. (a)  
11. (a) 12. (a) 13. (a) 14. (b) 15. (b)  
16. (a) 17. (c) 18. (a) 19. (a) 20. (a)
Chapter-8: Demand Forecasting

Self Assessment Questions

1. …………… forecasting is essential for a firm because it must plan its output to meet the forecasted demand according to the quantities demanded and the time at which these are demanded.
   a. Sales
   b. Demand
   c. Supply
   d. None of these

2. The forecasting demand helps a firm to arrange for the …………… of the necessary inputs without any wastage of materials and time
   a. Sales
   b. Demand
   c. Supplies
   d. None of these

3. The concept of demand forecasting is more relevant to the ……………… that the ………………
   a. Short-run, long-run
   b. long-run, short-run
   c. long-run, long-run
   d. None of these.

4. A forecaster needs to spend time talking to everyone who will be involved in ………………
   a. Collecting data
   b. distributing data
   c. Managing data
   d. None of these.

5. …………………forecasting combines the causal and time series methods
   a. Causal
   b. Qualitative
   c. Simulation
   d. None of these.

6. Which of the following method is used to represent a demand process of type?
a. \( D_t = a + \varepsilon t \)
b. \( D_t = a + t \)
c. \( D_t = \varepsilon a + t \)
d. None of these.

7. Which of the following is Method of Simple Average?

\[
\text{Simple Average} := \frac{\text{difference of Demands of chosen periods}}{\text{Number of chosen periods}}
\]

a. \( \text{Simple Average} := \frac{\text{Sum of supplies of chosen periods}}{\text{Number of chosen periods}} \)
b. \( \text{Simple Average} := \frac{\text{Sum of Demands of chosen periods}}{\text{Number of chosen periods}} \)
c. None of these.

d. None of these.

8. In Trend Method the time series data on the under forecast are used to fit a trend line or curve

a. True
b. False

9. The trend equation could not take a linear or any kind of non-linear form.

a. True
b. False

10. Time series forecasting techniques include simple moving averages, weighted moving averages and exponential smoothing.

a. True
b. False

11. Decisions relating to production scheduling involve:

a. short-term forecasting.
b. medium-term forecasting.
c. long-term forecasting.
d. both short-term as well as medium-term forecasting

12. Decisions relating to the sales and operations planning (aggregate planning) involve:

a. short-term forecasting.
b. medium-term forecasting.
c. long-term forecasting.
d. both short-term and medium-term forecasting

13. Which one of the following does not fall under qualitative forecasting method?
   a. Delphi method
   b. Moving average methods
   c. Market research
   d. Judgmental methods

14. For which of the following situation(s) is the market research method of forecasting suitable?
   a. When a firm is planning moderate changes on product innovations
   b. When a firm is market testing one of its new offerings
   c. When a firm is working with stable technology, planning moderate changes on product innovations or market testing one of its new offerings.
   d. When a firm is planning moderate changes on product innovations and market testing one of its new offerings

15. Which of the following forecasting method is suitable for launching new products?
   a. Market research
   b. Moving average methods
   c. Exponential smoothing
   d. Judgmental methods

16. Which of the following method(s) is(are) suitable for forecasting the demand of a product?
   a. Market research
   b. Judgmental methods
   c. Delphi method and judgmental method
   d. Market research and judgmental method
17. What is the measure of forecast error which calculates the average forecast error over n time periods known as?
   a. Mean-square error
   b. Mean error
   c. Mean absolute percentage error
   d. Mean absolute deviation

18. The measure of forecast error which calculates the average of absolute differences between the actual and the forecast demand over n time periods is known as:
   a. mean absolute deviation
   b. mean error
   c. mean-square error
   d. mean absolute percentage error

19. The measure of forecast error which calculates the average of square of the forecast errors is known as:
   a. mean absolute percentage error
   b. mean error
   c. mean absolute deviation
   d. mean-square error

20. The measure of forecast error which calculates the average of absolute forecast errors as a percentage of the actual demand is known as:
   a. mean error
   b. mean absolute percentage error
   c. mean-square error
   d. mean absolute deviation

Answers of Self Assessment Questions
1. (b)  2. (c)  3. (b)  4. (a)  5. (c)
6. (b)  7. (c)  8. (a)  9. (b)  10. (a)
11. (a) 12. (b) 13. (b) 14. (c) 15. (d)
16. (c)  
17. (b)  
18. (a)  
9. (d)  
20. (b)
Chapter-9: Inventory Model

Self Assessment Questions

1. One use of inventory is
   a. to decouple production and distribution processes
   b. to provide a hedge against inflation
   c. to enable an organization to take advantage of quantity discounts
   d. all of the above are uses of inventory

2. ABC analysis divides an organization's on-hand inventory into three classes based upon
   a. unit price
   b. the number of units on hand
   c. annual demand
   d. annual dollar values

3. Cycle counting
   a. provides a measure of inventory turnover
   b. assumes that all inventory records must be verified with the same frequency
   c. is a process by which inventory records are periodically verified
   d. all of the above

4. The major advantage of cycle counting is
   a. accurate inventory
   b. dispensing with the annual physical inventory
   c. the audit activity that accompanies cycle counting
   d. ABC analysis

5. The difference(s) between the basic EOQ model and the production order quantity model is (are) that
   a. the production order quantity model does not require the assumption of known, constant demand
   b. the EOQ model does not require the assumption of known, constant lead time
   c. the production order quantity model does not require the assumption of instantaneous delivery
   d. all of the above

6. Extra units that are held in inventory to reduce stockouts are called
   a. reorder point
   b. safety stock
c. just-in-time inventory
d. all of the above

7. Inventory record accuracy can be improved by

a. cycle counting
b. reorder points
c. ABC analysis
d. all of the above

8. The two most important inventory-based questions answered by the typical inventory model are

a. when to place an order and what is the cost of the order
b. when to place an order and how many of an item to order
c. how many of an item to order and what is the cost of this order
d. how many of an item to order and with whom the order should be placed

9. The appropriate level of safety stock is typically determined by [Hint]

a. minimizing expected stockout cost
b. choosing the level of safety stock that assures a given service level
c. carrying sufficient safety stock so as to eliminate all stockouts
d. all of the above

10. Which of the following is not a type of inventory?

a. raw material
b. work-in-process
c. MRP
d. finished goods

11. An appropriate technique for the control of inventory in services is

a. good personnel selection, training and discipline
b. tight control of incoming shipments
c. effective control of all goods leaving the facility
d. all of the above

12. In the probabilistic model, increasing the service level will

a. reduce the cost of the inventory policy
b. increase the cost of the inventory policy
c. have no impact on the cost of the inventory policy
d. cannot be determined
13. A system that triggers ordering on a uniform time basis is called a
   a. reorder point system
   b. fixed-period system
   c. fixed-quantity system
   d. EOQ

14. A company wishes to determine the EOQ for an item that has an annual demand of 2,000 units, a cost per order of $75, and annual carrying cost of $7.50 per unit. What is the EOQ?
   a. 73
   b. 100
   c. 200 units
   d. 40,000 units

15. A production facility is trying to determine the best batch size for an item that is produced intermittently. This item has an annual demand of 1,000 units, an annual carrying cost of $10 per unit, a setup cost of $400. They operate 50 weeks per year, and can produce 40 units per week. What is the best batch size for this item?
   a. 65
   b. 283
   c. 400
   d. 800

16. Inventory carried for the purpose of providing flexibility to each decision-making unit to manage its operations independently is known as
   a. Decoupling inventory
   b. Pipeline inventory
   c. Cycle inventory
   d. Seasonal inventory

17. Cycle inventory helps in taking care of any special event that does not occur on a regular basis
   a. providing flexibility to each decision-making unit to manage its operations independently
   b. taking care of uncertainty in demand and supply of products/components
   c. finding out the amount of stock required during a finite period in order to move the materials from one location to another
   d. taking advantage of economies of scale and reducing cost within the supply chain

18. The inventory which is dependent on alternative modes of transportation is known as
a. Seasonal inventory  
b. Cycle inventory  
c. Pipeline inventory  
d. Safety inventory  

19. In an automobile manufacturing facility, the management has brought down the cost of ordering of automotive components from Rs 500 to Rs 50 through the introduction of electronic ordering. The annual demand of cars is 15,000 units. Inventory carrying cost of automotive components is Rs 20 per unit per year. The inventory turnover ratio in both the cases would be  

a. 32.64 and 112.48  
b. 35.64 and 111.48  
c. 33.64 and 107.48  
d. 34.64 and 109.48  

20. In an automobile manufacturing facility, the management has brought down the cost of ordering of automotive components from Rs 500 to Rs 50 through the introduction of electronic ordering. The annual demand of cars is 15,000 units. Inventory carrying cost of automotive components is Rs 20 per unit per year. Now assume the company runs its manufacturing operation for 300 days a year. Number of days inventory to be carried in both the cases would be  

a. 7.66 and 1.74  
b. 9.66 and 3.74  
c. 8.66 and 1.74  
d. 8.66 and 2.74  

Answers of Self Assessment Questions

1. (d)  
2. (d)  
3. (c)  
4. (b)  
5. (c)  
6. (b)  
7. (d)  
8. (b)  
9. (b)  
10. (c)  
11. (d)  
12. (b)  
13. (b)  
14. (c)  
15. (c)  
16. (a)  
17. (d)  
18. (c)  
19. (d)  
20. (d)
Chapter-10: Simulation

Self Assessment Questions

1. Which of the following are advantages of simulation?
   a. Simulation allows "what-if?" type of questions.
   b. Simulation can usually be performed by hand or using a small calculator.
   c. Simulation does not interfere with the real-world system.
   d. (a) and (c) only

2. 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.

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

4. The first step in the Monte Carlo simulation process is to
   a. set up cumulative probability distributions.
   b. establish random number intervals.
   c. simulate trials.
   d. set up probability distributions.

5. 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.
6. 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.

7. From a practical perspective, if we have a waiting line problem for which the Poisson and negative exponential distributions do not apply, and we desire a reasonably accurate solution, we should
   a. modify the queuing equations to make them appropriate for our problem.
   b. use simulation.
   c. use the simple queuing equations even though we realize they are inappropriate.
   d. build a physical model and use that to study the problem.

8. All of the following are various ways of generating random numbers except
   a. spin of roulette wheel
   b. computer-generated random numbers
   c. Von Neumann midsquare method
   d. Fibonacci series

9. 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.

10. Simulation should be thought of as a technique for
    a. increasing one's understanding of a problem.
    b. obtaining a relatively inexpensive solution to a problem.
    c. obtaining an optimal solution to a problem.
d. providing quick and dirty answers to complex problems.

11. Monte Carlo simulation is likely to be most useful:
   a. For simple problems
   b. For problems of moderate complexity
   c. For very complex problems
   d. Regardless of the problem's complexity

12. The following is not among the steps involved in the Monte Carlo method:
   a. Modeling the project
   b. Specifying the numbers on the roulette wheel
   c. Specifying probabilities
   d. Simulating the cash flows

13. The hardest and most important part of a simulation is:
   a. Simulating the cash flows
   b. Specifying the inter-dependencies
   c. Calculating the payback period
   d. Specifying the numbers on the roulette wheel

14. When conducting a sensitivity analysis, variables are set one at a time to their optimistic and pessimistic values.
   a. True
   b. False

15. The break-even point in terms of EAC flows is usually lower than the break-even point on an accounting basis.
   a. True
   b. False

16. Monte Carlo simulation is a tool for considering all possible combinations of variables.
17. Which of the following is not a limit to sensitivity analysis?
   a. It gives ambiguous results
   b. Underlying variables are likely to be interrelated
   c. It is complex to set up
   d. It is difficult to extract the forecaster’s notion of true probabilities of possible outcomes

18. Scenario Analysis allows managers to look at different ......................... combinations of variables.
   a. and inconsistent
   b. and unknown
   c. but consistent
   d. none of the above

19. Which of the following is not a step in Monte Carlo simulation?
   a. Modeling the Project
   b. Specify Probabilities
   c. Calculate Present Values
   d. Determine the discounted payback period

20. Which of the following is not considered a real option?
   a. Option to Expand
   b. Option to Hire
   c. Option to Abandon
   d. Timing Options

Answers for Self Assessment Questions
1. (d)      2.(d)      3.(c)      4.(d)      5.(c)
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