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Computer Science Grade 12 — Chapter 1

Computer Systems

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Independent practice MCQs from the supplied Class 12 Computer Science notes pack. Total: 50 questions.

A. Important / Main Topics

1. Usability refers to:

(A) The degree to which a device or system can be used easily and efficiently
(B) The measures taken to protect data from unauthorized access
(C) The design of systems for people with disabilities
(D) The speed at which a system processes data

Correct Answer: A

Explanation: Usability is the degree to which a device or system can be used by specific users to achieve specified goals with effectiveness, efficiency, and satisfaction.

2. Which of the following is a key aspect of usability?

(A) Encryption
(B) Effectiveness
(C) Availability
(D) Authentication

Correct Answer: B

Explanation: The three key aspects of usability are effectiveness, efficiency, and satisfaction.

3. Which principle of usability states that the design should be as straightforward as possible?

(A) Consistency
(B) Feedback
(C) Simplicity
(D) Learnability

Correct Answer: C

Explanation: Simplicity means removing unnecessary complexity and focusing on core functionalities.

4. The principle of usability that ensures similar design across different parts of a system is called:

(A) Feedback
(B) Error prevention
(C) Accessibility
(D) Consistency

Correct Answer: D

Explanation: Consistency means interfaces maintain a consistent design across different parts of the system.

5. Which security objective ensures that sensitive information is accessible only to authorized users?

(A) Confidentiality
(B) Integrity
(C) Availability
(D) Usability

Correct Answer: A

Explanation: Confidentiality ensures that sensitive information is accessible only to authorized users.

6. The CIA triad consists of:

(A) Confidentiality, Integrity, Accessibility
(B) Confidentiality, Integrity, Availability
(C) Control, Integrity, Availability
(D) Confidentiality, Interaction, Availability

Correct Answer: B

Explanation: The CIA triad stands for Confidentiality, Integrity, and Availability.

7. Which of the following is a key aspect of accessibility?

(A) Encryption
(B) Authentication
(C) Inclusivity
(D) Efficiency

Correct Answer: C

Explanation: The key aspects of accessibility are inclusivity, adaptability, and compliance.

8. Perceivability in accessibility means that:

(A) Users can navigate the interface using a keyboard
(B) Users can customize the system
(C) Users can comply with legal requirements
(D) Users can perceive the information and user interface components

Correct Answer: D

Explanation: Perceivability means all users must be able to perceive the information and UI components, regardless of sensory abilities.

9. Which of the following is a solution for visual impairments?

(A) Screen readers
(B) Closed captions
(C) Voice recognition
(D) On-screen keyboards

Correct Answer: A

Explanation: Screen readers convert text and visual elements into spoken words or braille for users with visual impairments.

10. Human-Computer Interaction (HCI) is best defined as:

(A) The study of computer hardware
(B) A multidisciplinary field studying how people interact with computers
(C) A programming language
(D) A type of database

Correct Answer: B

Explanation: HCI is a multidisciplinary field that studies how people interact with computers, digital devices, and software applications.

11. Which of the following is NOT a key element of HCI?

(A) Users
(B) Tasks
(C) Budget
(D) Environment

Correct Answer: C

Explanation: The four key elements of HCI are Users, Tasks, Interface, and Environment.

12. Which component of usability refers to how easy it is for new users to accomplish basic tasks the first time they encounter the system?

(A) Efficiency
(B) Memorability
(C) Satisfaction
(D) Learnability

Correct Answer: D

Explanation: Learnability refers to how easy it is for new users to accomplish basic tasks the first time they encounter the system.

13. Which type of usability testing involves a facilitator guiding users through tasks?

(A) Moderated testing
(B) Unmoderated testing
(C) A/B testing
(D) Quantitative testing

Correct Answer: A

Explanation: In moderated testing, a facilitator or moderator is present to guide users through tasks.

14. Which of the following is a common usability issue?

(A) Strong encryption
(B) Complex interfaces
(C) High processing speed
(D) Large storage capacity

Correct Answer: B

Explanation: Complex interfaces are one of the four common usability issues described in the textbook.

15. A trade-off between usability and security means:

(A) Both always improve together
(B) They are unrelated
(C) Improving one can degrade the other
(D) They are always in conflict

Correct Answer: C

Explanation: Enhancing security can degrade usability, and enhancing usability can degrade security.

16. A mobile banking app is designed so that a new user can quickly learn to check their balance and transfer funds. This primarily demonstrates which component of usability?

(A) Efficiency
(B) Memorability
(C) Error handling
(D) Learnability

Correct Answer: D

Explanation: Learnability is about how easily new users can accomplish tasks the first time they encounter the system.

17. An e-commerce website provides a visual confirmation when an item is added to the shopping cart. This is an example of which usability principle?

(A) Feedback
(B) Simplicity
(C) Consistency
(D) Error prevention

Correct Answer: A

Explanation: Feedback — this correctly answers the question.

18. Microsoft Word prompting a user to save changes before closing a document is an example of:

(A) Simplicity
(B) Error prevention
(C) Consistency
(D) Learnability

Correct Answer: B

Explanation: Error prevention involves designing the system so errors are less likely to happen, such as prompting to save work before closing.

19. Which type of usability testing focuses on understanding the user's experience, thoughts, and feelings?

(A) Quantitative testing

(B) A/B testing
(C) Qualitative testing
(D) Remote testing

Correct Answer: C

Explanation: Qualitative testing — this correctly answers the question.

20. An online retailer randomly shows two versions of its homepage to different users to see which one leads to more sales. This is an example of:

(A) Moderated testing
(B) Unmoderated testing
(C) Qualitative testing
(D) A/B testing

Correct Answer: D

Explanation: A/B testing compares two versions of a system to see which one performs better.

21. A website has small text and low-contrast colors that are difficult for visually impaired users to read. This is an example of:

(A) Lack of accessibility
(B) Complex interface
(C) Inconsistent navigation
(D) Poor error message

Correct Answer: A

Explanation: Lack of accessibility means the system is not designed to accommodate users with disabilities.

22. Which principle of usability is demonstrated when Microsoft Office uses similar menus across Word, Excel, and PowerPoint?

(A) Simplicity
(B) Consistency
(C) Feedback
(D) Error prevention

Correct Answer: B

Explanation: Consistency — this correctly answers the question.

23. A company encrypts credit card numbers before storing them in a database. This primarily ensures:

(A) Integrity
(B) Availability
(C) Confidentiality
(D) Usability

Correct Answer: C

Explanation: Encryption ensures that even if a hacker gains access, they cannot read the information without the decryption key, maintaining confidentiality.

24. A digital signature on an email ensures that the content has not been altered after it is sent. This primarily ensures:

(A) Confidentiality
(B) Availability
(C) Accessibility
(D) Integrity

Correct Answer: D

Explanation: Integrity ensures that data remains unaltered during storage, transmission, or processing. A digital signature verifies that the content has not been tampered with.

25. A business uses multiple servers so that if one fails, another takes over immediately. This primarily ensures:

(A) Availability

(B) Confidentiality
(C) Integrity
(D) Usability

Correct Answer: A

Explanation: Availability ensures that systems and data are accessible and usable when needed, even during or after a disruption.

B. Less Important / Secondary Topics

26. Which of the following best describes the Target Data Breach of 2013?

(A) Hackers accessed Target's network through a third-party vendor using stolen credentials
(B) Target's servers were physically stolen
(C) Target's employees leaked customer data
(D) Target's website was flooded with traffic

Correct Answer: A

Explanation: Hackers accessed Target's network through a third-party vendor using stolen credentials — this correctly answers the question.

27. In the context of HCI, the "interface" refers to:

(A) The physical device used
(B) The point of interaction between the user and the system
(C) The software programming language
(D) The hardware configuration

Correct Answer: B

Explanation: The interface is the point of interaction between the user and the system, through which users interact via various input and output mechanisms.

28. Which element of HCI includes factors such as lighting, noise, and whether the use is solitary or collaborative?

(A) Users
(B) Tasks
(C) Environment
(D) Interface

Correct Answer: C

Explanation: The environment includes the physical and social context of the interaction, such as lighting, noise, and whether the use is solitary or collaborative.

29. A user who hasn't used a banking app for a month can still remember how to pay a bill. This demonstrates which component of usability?

(A) Learnability
(B) Efficiency
(C) Error handling
(D) Memorability

Correct Answer: D

Explanation: Memorability refers to how easily users can remember how to use the system after a period of not using it.

30. An educational platform includes captions and transcripts for all video content. This primarily improves accessibility for:

(A) Users with hearing impairments
(B) Users with visual impairments
(C) Users with motor impairments
(D) Users with cognitive impairments

Correct Answer: A

Explanation: Captions and transcripts provide textual representations of audio content, helping users who are deaf or hard of hearing.

31. A TV remote designed with large buttons and high-contrast colors is an example of:

(A) Simplicity
(B) Accessibility
(C) Consistency
(D) Error prevention

Correct Answer: B

Explanation: Large buttons and high-contrast colors assist users with vision or dexterity issues, making the remote more accessible.

32. Which of the following is a common usability issue where navigation elements change from one section to another?

(A) Complex interface
(B) Poor error message
(C) Inconsistent navigation
(D) Lack of accessibility

Correct Answer: C

Explanation: Inconsistent navigation occurs when navigation structure or elements change from one.

33. An online form displays "Error 150: Invalid input" when a user enters an incorrect date format. This is an example of:

(A) Complex interface
(B) Inconsistent navigation
(C) Lack of accessibility
(D) Poor error message

Correct Answer: D

Explanation: Poor error messages are unclear, overly technical, or provide little guidance on how to resolve the issue.

34. Which of the following is a recommendation for cybersecurity measures that focuses on protecting users' personal data?

(A) Privacy
(B) Efficiency
(C) Cost
(D) Ethics

Correct Answer: A

Explanation: Privacy protection ensures that users' personal data is handled responsibly and securely.

35. Using a password manager like LastPass or Bitwarden is an example of which recommendation for cybersecurity measures?

(A) Cost
(B) Efficiency
(C) Privacy
(D) Ethics

Correct Answer: B

Explanation: Efficiency — this correctly answers the question.

36. A company implements multi-factor authentication (MFA) for its banking app. While this improves security, users complain about the extra time required to log in. Which trade-off does this best illustrate?

(A) Confidentiality vs. integrity
(B) Access control vs. availability
(C) Authentication complexity vs. usability
(D) Encryption vs. performance

Correct Answer: C

Explanation: Authentication complexity vs. usability — this correctly answers the question.

37. A hospital restricts access to patient records so that only authorized doctors can view them. However, doctors frequently need to request permission from IT to access files, delaying patient care. This best illustrates the trade-off between:

(A) Confidentiality and integrity
(B) Availability and confidentiality
(C) Encryption and performance
(D) Access controls and usability

Correct Answer: D

Explanation: Access controls protect sensitive data by restricting permissions, but they can hinder usability when users frequently encounter permission issues.

38. A system is designed with a simple interface, clear feedback, and error prevention. Which component of usability is most likely to be indirectly improved by all these principles?

(A) Learnability
(B) Efficiency
(C) Memorability
(D) Satisfaction

Correct Answer: A

Explanation: A simple interface with clear feedback and error prevention is easier for new users to learn, indirectly improving learnability.

39. A company stores customer data in the cloud. The data is encrypted, and access is restricted to authorized employees. However, a phishing attack tricks an employee into revealing their login credentials. Which security objective is most directly compromised?

(A) Integrity
(B) Confidentiality
(C) Availability
(D) Usability

Correct Answer: B

Explanation: The phishing attack compromises confidentiality because unauthorized access to sensitive data is gained through stolen credentials.

40. A university uses a biometric fingerprint system for attendance. Students with worn fingerprints cannot register their attendance. Which principle of accessibility is most directly violated?

(A) Perceivability
(B) Inclusivity
(C) Operability
(D) Compliance

Correct Answer: C

Explanation: Operability ensures that users can navigate and use the interface regardless of their physical abilities. Worn fingerprints affect the ability to operate the system.

41. A website provides alt text for all images and captions for all videos. This primarily addresses which two principles of accessibility?

(A) Inclusivity and compliance
(B) Adaptability and compliance
(C) Perceivability and inclusivity
(D) Perceivability and operability

Correct Answer: D

Explanation: Alt text and captions address perceivability (users can perceive information) and operability (users can navigate and use the interface).

42. A company uses a password manager, enables MFA, and provides user-friendly privacy settings. Which combination of cybersecurity recommendations does this best represent?

(A) Efficiency, privacy, and ethics
(B) Cost, privacy, and ethics
(C) Efficiency, cost, and privacy
(D) Privacy, ethics, and cost

Correct Answer: A

Explanation: Password managers improve efficiency, MFA protects privacy, and user-friendly privacy settings are an ethical consideration.

43. A school wants to ensure that students with visual impairments can use its online learning platform. Which combination of features would be most effective?

(A) Screen readers and keyboard navigation
(B) Screen readers, high-contrast modes, and zoom functions
(C) High-contrast modes and voice recognition
(D) Closed captions and transcripts

Correct Answer: B

Explanation: Screen readers, high-contrast modes, and zoom functions — this correctly answers the question.

44. A company wants to protect its data during transmission over the internet. It uses encryption and access controls. Which additional recommendation for cybersecurity measures would best complement these measures?

(A) Cost
(B) Efficiency
(C) Privacy
(D) Ethics

Correct Answer: C

Explanation: Privacy ensures that data is protected during transmission and that users' personal information is handled responsibly.

45. A user with a motor impairment cannot use a mouse. Which accessibility solution would be most appropriate?

(A) Screen reader
(B) High-contrast mode
(C) Closed captions
(D) Voice recognition software

Correct Answer: D

Explanation: Voice recognition software enables users to control their device using voice commands, which is sui.

46. A company wants to improve both usability and security. It simplifies its interface while adding MFA and encryption. Which statement best describes this approach?

(A) Usability and security can be balanced with thoughtful design
(B) Usability and security are always in conflict, so one must be sacrificed
(C) Security should always take priority over usability
(D) Usability should always take priority over security

Correct Answer: A

Explanation: The textbook emphasizes that designers must balance usability and security to create systems that protect users without compromising their experience.

47. A website uses a consistent navigation menu across all pages, provides clear error messages, and includes alt text for images. Which combination of usability principles and accessibility features does this best represent?

(A) Consistency, poor error messages, and perceivability
(B) Consistency, clear error messages, and perceivability
(C) Simplicity, clear error messages, and operability

(D) Consistency, clear error messages, and operability

Correct Answer: B

Explanation: Consistency, clear error messages, and perceivability — this correctly answers the question.

48. A company implements a system where users can customize text size and color contrast. This primarily addresses which aspect of accessibility?

(A) Perceivability
(B) Operability
(C) Adaptability
(D) Compliance

Correct Answer: C

Explanation: Adaptability allows users to customize the way they interact with the system to suit their needs.

49. A school wants to ensure that its online platform is accessible to students with hearing impairments. Which combination of features would be most effective?

(A) Screen readers and zoom functions
(B) High-contrast modes and keyboard navigation
(C) Voice recognition and on-screen keyboards
(D) Closed captions, transcripts, and sign language interpretation

Correct Answer: D

Explanation: Closed captions, transcripts, and sign language interpretation — this correctly answers the question.

50. A company uses auto-save, password managers, and cloud-based security services. Which combination of cybersecurity recommendations does this best represent?

(A) Efficiency, cost, and privacy
(B) Efficiency, cost, and ethics
(C) Privacy, ethics, and cost
(D) Efficiency, privacy, and ethics

Correct Answer: A

Explanation: Efficiency, cost, and privacy — this correctly answers the question.

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Computer Science Grade 12 — Chapter 2

Computational Thinking and Algorithms

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Independent practice MCQs from the supplied Class 12 Computer Science notes pack. Total: 50 questions.

A. Important / Main Topics

1. A data structure is best defined as:

(A) A way to store and organize data in memory
(B) A method of communication
(C) A system for internet access
(D) A graphical interface design

Correct Answer: A

Explanation: A data structure defines the way for organizing and storing data so that it can efficiently be accessed and modified.

2. Which data structure stores elements in contiguous memory locations?

(A) Linked List
(B) Array
(C) Stack
(D) Queue

Correct Answer: B

Explanation: Arrays use contiguous memory locations to store elements, which are identified by indexes.

3. Which data structure uses the LIFO (Last-In, First-Out) principle?

(A) Queue
(B) Array
(C) Stack
(D) Linked List

Correct Answer: C

Explanation: Stacks use the LIFO principle, where the most recently added element is the first to be removed.

4. Which data structure uses the FIFO (First-In, First-Out) principle?

(A) Stack
(B) Tree
(C) Graph
(D) Queue

Correct Answer: D

Explanation: Queues use the FIFO principle, where the first element added is the first to be removed.

5. In a singly linked list, each node contains:

(A) Data and a reference to the next node
(B) Data and a reference to the previous node
(C) Only data
(D) Index value and data

Correct Answer: A

Explanation: In a singly linked list, each node contains Data and a reference to the next node.

6. Which data structure models complex relationships and networks using nodes and edges?

(A) Array
(B) Graph
(C) Stack
(D) Queue

Correct Answer: B

Explanation: Graph — this correctly answers the question.

7. The topmost node of a tree is called the:

(A) Leaf
(B) Parent
(C) Root
(D) Child

Correct Answer: C

Explanation: The topmost node of a tree is called the root.

8. A node in a tree that does not have any children is called a:

(A) Root node
(B) Sibling node
(C) Parent node
(D) Leaf node

Correct Answer: D

Explanation: A node with no children is referred to as a leaf node.

9. Which operation adds a new element at the top of a stack?

(A) Push
(B) Enqueue
(C) Dequeue
(D) Pop

Correct Answer: A

Explanation: Push — this correctly answers the question.

10. Which operation removes an element from the front of a queue?

(A) Enqueue
(B) Dequeue
(C) Push
(D) Pop

Correct Answer: B

Explanation: Dequeue — this correctly answers the question.

11. Which of the following is a criterion for evaluating computational solutions?

(A) Popularity
(B) Complexity of code
(C) Correctness
(D) Length of code

Correct Answer: C

Explanation: The three criteria are correctness, clarity, and efficiency. Popularity and code length are not criteria.

12. An algorithm is considered correct if it:

(A) Is short and concise
(B) Uses minimal memory
(C) Is written in Python
(D) Generates the expected output for all valid inputs

Correct Answer: D

Explanation: Correctness means the algorithm produces the expected output for all valid inputs, including edge cases.

13. Which of the following is a measure of efficiency in computational solutions?

(A) Time complexity
(B) Clarity
(C) Correctness

(D) Code length

Correct Answer: A

Explanation: Efficiency is measured using time complexity and space complexity, often expressed in Big O notation.

14. The time complexity of binary search is:

(A) O(1)
(B) O(log n)
(C) O(n)
(D) O(n²)

Correct Answer: B

Explanation: The time complexity of binary search is O(log n).

15. The time complexity of linear search is:

(A) O(1)
(B) O(log n)
(C) O(n)
(D) O(n²)

Correct Answer: C

Explanation: The time complexity of linear search is O(n).

16. Which of the following is a disadvantage of arrays?

(A) Fast access by index
(B) Contiguous memory allocation
(C) Simple implementation
(D) Fixed size that must be declared at the start

Correct Answer: D

Explanation: Arrays are fixed in size; resizing is costly because it requires creating a new array and shifting elements.

17. Which data structure is most suitable when elements need to be inserted and deleted frequently?

(A) Linked List
(B) Array
(C) Stack
(D) Queue

Correct Answer: A

Explanation: Linked lists are dynamic in size and allow easy insertion and deletion at any position.

18. In a doubly linked list, each node contains:

(A) Data and a reference to the next node only
(B) Data and references to both the previous and next nodes
(C) Only data
(D) An index value and data

Correct Answer: B

Explanation: In a doubly linked list, each node contains Data and references to both the previous and next nodes.

19. In a circular linked list, the last node:

(A) Contains NULL
(B) Is deleted
(C) Points back to the first node
(D) Has no data

Correct Answer: C

Explanation: In a circular linked list, the last node Points back to the first node.

20. Which operation returns the start element of a queue without removing it?

(A) Enqueue
(B) Dequeue

(C) IsEmpty
(D) Front

Correct Answer: D

Explanation: Front — this correctly answers the question.

21. A graph where at least one path exists between every pair of nodes is called a:

(A) Connected graph
(B) Directed graph
(C) Weighted graph
(D) Cyclic graph

Correct Answer: A

Explanation: A graph where at least one path exists between every pair of nodes is called a Connected graph.

22. A graph where edges have a direction associated with them is called a:

(A) Connected graph
(B) Directed graph
(C) Undirected graph
(D) Weighted graph

Correct Answer: B

Explanation: In a directed graph, edges have a direction associated with them.

23. In in-order traversal of a binary tree, the order of visiting nodes is:

(A) Root → Left → Right
(B) Left → Right → Root
(C) Left → Root → Right
(D) Right → Root → Left

Correct Answer: C

Explanation: In in-order traversal of a binary tree, the order of visiting nodes is Left → Root → Right.

24. In pre-order traversal of a binary tree, the order of visiting nodes is:

(A) Left → Root → Right
(B) Left → Right → Root
(C) Right → Left → Root
(D) Root → Left → Right

Correct Answer: D

Explanation: In pre-order traversal of a binary tree, the order of visiting nodes is Root → Left → Right.

25. In post-order traversal of a binary tree, the order of visiting nodes is:

(A) Left → Right → Root
(B) Root → Left → Right
(C) Left → Root → Right
(D) Right → Root → Left

Correct Answer: A

Explanation: In post-order traversal of a binary tree, the order of visiting nodes is Left → Right → Root.

B. Less Important / Secondary Topics

26. In-order traversal is often used with binary search trees because:

(A) It visits nodes in ascending order
(B) It visits the root first
(C) It visits the root last
(D) It skips the left subtree

Correct Answer: A

Explanation: In-order traversal of a BST visits nodes in ascending order, making it useful for sorting and searching.

27. Which traversal is often used for deleting nodes or freeing memory?

(A) In-order
(B) Post-order
(C) Pre-order
(D) Level-order

Correct Answer: B

Explanation: Post-order traversal processes children before their parent, which is useful for deleting nodes or freeing memory.

28. Which traversal is useful when we need to work with the root node before its children?

(A) In-order
(B) Post-order
(C) Pre-order
(D) Level-order

Correct Answer: C

Explanation: Pre-order traversal visits the root before its children, making it useful when the root must be processed first.

29. Which of the following is an advantage of linked lists over arrays?

(A) Fast access by index
(B) Contiguous memory allocation
(C) Fixed size
(D) Dynamic size

Correct Answer: D

Explanation: Linked lists can grow and shrink as needed, unlike arrays which have a fixed size.

30. An algorithm is considered clear if:

(A) Its steps are logically structured and easily understandable
(B) It is short
(C) It uses minimal memory
(D) It runs quickly

Correct Answer: A

Explanation: Clarity means the algorithm's steps are logically structured and easily understood, often aided by descriptive names and comments.

31. Which of the following is an example of O(1) complexity?

(A) Binary search
(B) Accessing the first element of an array by index
(C) Linear search
(D) Bubble sort

Correct Answer: B

Explanation: O(1) constant time means the running time is constant regardless of input size, as in accessing an array element by index.

32. Which of the following is an example of $O(n^2)$ complexity?

(A) Binary search
(B) Linear search
(C) Bubble sort
(D) Accessing the first element of an array

Correct Answer: C

Explanation: Bubble sort uses nested loops and has a time complexity of $O(n^2)$.

33. The space complexity of the Euclidean Algorithm is:

(A) O(log n)
(B) O(n)
(C) $O(n^2)$
(D) O(1)

Correct Answer: D

Explanation: The Euclidean Algorithm uses only a few variables, giving a constant space complexity of O(1).

34. The time complexity of the Euclidean Algorithm is:

(A) O(log min(a, b))
(B) O(1)
(C) O(n)
(D) O(n²)

Correct Answer: A

Explanation: The Euclidean Algorithm reduces the problem size significantly with each iteration, giving a logarithmic time complexity.

35. Counting vowels in a string requires examining each character once. Its time complexity is:

(A) O(1)
(B) O(n)
(C) O(log n)
(D) O(n²)

Correct Answer: B

Explanation: Counting vowels in a string requires examining each character once. Its time complexity is O(n).

36. A programmer must store a fixed-size table of student marks where fast access by row and column is required. Which data structure is most suitable?

(A) Linked list
(B) Stack
(C) Two-dimensional array
(D) Queue

Correct Answer: C

Explanation: A 2-D array (matrix) stores elements in rows and columns with contiguous memory, allowing fast access by two indexes.

37. A system needs to process tasks in the exact order they arrive. Which data structure should be used?

(A) Stack
(B) Tree
(C) Graph
(D) Queue

Correct Answer: D

Explanation: Queue — this correctly answers the question.

38. A system needs to handle "undo" operations, where the most recent action is reversed first. Which data structure is most suitable?

(A) Stack
(B) Queue
(C) Array
(D) Graph

Correct Answer: A

Explanation: The LIFO principle of a stack matches the "undo" behavior, where the most recent action is reversed first.

39. A binary tree has the following in-order traversal: 4 → 2 → 5 → 1 → 3 → 6. Which node is the root?

(A) 4
(B) 1
(C) 2
(D) 6

Correct Answer: B

Explanation: In in-order traversal (Left → Root → Right), the root appears between the left and right subtrees. Here, 1 is between the left group (4, 2, 5) and the right group (3, 6), so 1 is the root.

40. A binary tree has the following pre-order traversal: 1 → 2 → 4 → 5 → 3 → 6. Which node is the root?

(A) 4
(B) 2
(C) 1
(D) 6

Correct Answer: C

Explanation: Pre-order traversal visits the root first, so the first node in the sequence (1) is the root.

41. A binary tree has the following post-order traversal: 4 → 5 → 2 → 6 → 3 → 1. Which node is the root?

(A) 4
(B) 5
(C) 3
(D) 1

Correct Answer: D

Explanation: Post-order traversal visits the root last, so the last node in the sequence (1) is the root.

42. An algorithm produces the correct output for normal inputs but fails for an empty array. Which criterion is not fully satisfied?

(A) Correctness
(B) Clarity
(C) Efficiency
(D) Popularity

Correct Answer: A

Explanation: Correctness requires the algorithm to produce the expected output for all valid inputs, including edge cases like an empty array.

43. A sorting algorithm takes 10 seconds for 100 elements and 40 seconds for 200 elements. Which Big O complexity is most consistent with this behavior?

(A) O(1)
(B) $O(n^2)$
(C) O(log n)
(D) O(n)

Correct Answer: B

Explanation: When the input size doubles (100 → 200), the time quadruples (10 → 40 seconds). This is characteristic of $O(n^2)$ quadratic time.

44. A search algorithm takes 1 second for 1,000 elements and 2 seconds for 2,000 elements. Which Big O complexity is most consistent with this behavior?

(A) O(1)
(B) O(log n)
(C) O(n)
(D) $O(n^2)$

Correct Answer: C

Explanation: When the input size doubles and the time also doubles, the behavior is linear, consistent with O(n).

45. Two algorithms solve the same problem. Algorithm X is correct but unclear and inefficient. Algorithm Y is clear and efficient but fails for some valid inputs. Which statement is best?

(A) Algorithm X is better because it is correct
(B) Algorithm Y is better because it is efficient
(C) Both are equally acceptable
(D) Neither is fully satisfactory; a good solution must balance correctness, clarity, and efficiency

Correct Answer: D

Explanation: A good computational solution must satisfy all three criteria: correctness, clarity, and efficiency. Each algorithm fails at least one criterion.

46. In the Euclidean Algorithm, what happens when b becomes zero?

(A) The algorithm stops and a contains the GCD
(B) The algorithm restarts
(C) The algorithm returns zero
(D) The algorithm continues with new values

Correct Answer: A

Explanation: The algorithm stops and a contains the GCD — this correctly answers the question.

47. A programmer must store data that can grow and shrink dynamically, with frequent insertion and deletion at arbitrary positions. Which data structure is most suitable?

(A) Array
(B) Linked list
(C) Stack
(D) Queue

Correct Answer: B

Explanation: Linked lists are dynamic in size and allow easy insertion and deletion at any position, unlike arrays with fixed size.

48. A tree traversal visits the root, then the left subtree, then the right subtree. Which traversal is this?

(A) In-order
(B) Post-order
(C) Pre-order
(D) Level-order

Correct Answer: C

Explanation: Pre-order — this correctly answers the question.

49. An algorithm's time complexity is O(log n). If the input size increases from 1,000 to 1,000,000, the number of steps increases approximately:

(A) By a factor of 1,000
(B) By a factor of 1,000,000
(C) It remains constant
(D) By a factor of 2

Correct Answer: D

Explanation: For O(log n), the number of steps grows logarithmically. log□(1,000) ≈ 10 and log□(1,000,000) ≈ 20, so the steps roughly double.

50. A student claims that an algorithm is efficient because it uses few lines of code. Which statement best evaluates this claim?

(A) The claim is incorrect; efficiency is about time and space complexity, not code length
(B) The claim is correct; fewer lines always mean better efficiency
(C) The claim is correct only for sorting algorithms
(D) The claim is correct only for search algorithms

Correct Answer: A

Explanation: Efficiency refers to how well an algorithm uses computer resources (time and memory), measured by time and space complexity, not by the number of lines of code.

Public Library · FBISE / NBF

Computer Science Grade 12 — Chapter 3

Programming Fundamentals

by Public Library

Independent practice MCQs from the supplied Class 12 Computer Science notes pack. Total: 50 questions.

A. Important / Main Topics

1. A programming paradigm is best defined as:

(A) A particular methodology to use a programming language for problem-solving
(B) A type of computer hardware
(C) A programming language
(D) A software application

Correct Answer: A

Explanation: A programming paradigm describes a process for creating and organizing code, acting as a particular methodology to use a language for problem-solving.

2. Which paradigm divides code into functions based on functionality?

(A) Object-Oriented Programming
(B) Functional Programming
(C) Procedural Programming
(D) Structural Programming

Correct Answer: B

Explanation: Functional programming divides code into functions based on functionality, focusing on what is to be achieved.

3. Which paradigm is based on data and objects that model real-world entities?

(A) Functional Programming
(B) Procedural Programming
(C) Object-Oriented Programming
(D) Structural Programming

Correct Answer: C

Explanation: OOP is based on data and objects, modeling real-world entities with attributes and methods.

4. In OOP, a class is best described as:

(A) An instance of an object
(B) A function in functional programming
(C) A type of data structure
(D) A template for creating objects

Correct Answer: D

Explanation: A class is an object creation template that specifies methods and attributes for its objects.

5. In OOP, an object is:

(A) An instance of a class
(B) A template for creating classes
(C) A function in functional programming
(D) A type of data structure

Correct Answer: A

Explanation: An object is an instance of a class that denotes a physical thing with distinct properties and behaviors.

6. Which OOP concept involves hiding data and combining it with methods?

(A) Abstraction
(B) Encapsulation
(C) Inheritance

(D) Polymorphism

Correct Answer: B

Explanation: Encapsulation — this correctly answers the question.

7. Which OOP concept simplifies complex scenarios by showing only necessary information?

(A) Encapsulation
(B) Inheritance
(C) Abstraction
(D) Polymorphism

Correct Answer: C

Explanation: Abstraction shows only essential information while hiding background details or implementation.

8. Which OOP concept allows a subclass to inherit attributes and methods from a parent class?

(A) Encapsulation
(B) Abstraction
(C) Polymorphism
(D) Inheritance

Correct Answer: D

Explanation: Inheritance allows a subclass to inherit attributes and methods from a parent class, reducing code repetition.

9. Which OOP concept allows objects of different classes to be treated as instances of a common type?

(A) Polymorphism
(B) Encapsulation
(C) Abstraction
(D) Inheritance

Correct Answer: A

Explanation: Polymorphism allows objects of different classes to be treated as instances of a common type.

10. A Python list is best described as:

(A) An immutable collection of items
(B) An ordered, mutable collection of items
(C) A type of function
(D) A type of loop

Correct Answer: B

Explanation: A Python list is best described as An ordered, mutable collection of items.

11. A Python tuple is best described as:

(A) A mutable list
(B) A type of dictionary
(C) An immutable list
(D) A type of function

Correct Answer: C

Explanation: A tuple is a special type of list that is immu.

12. A Python set is best described as:

(A) An ordered collection of items
(B) A type of dictionary
(C) A type of function
(D) A collection of unique and unordered elements

Correct Answer: D

Explanation: A set is a collection of unique and unordered elements; duplicates are automatically removed.

13. A Python dictionary is best described as:

(A) A collection of key-value pairs
(B) An ordered collection of items

(C) A collection of unique and unordered elements
(D) A type of function

Correct Answer: A

Explanation: A dictionary stores data as key-value pairs, where each key is unique and associated with a value.

14. Which function is used to add an element at the end of a Python list?

(A) `insert()`
(B) `append()`
(C) `remove()`
(D) `pop()`

Correct Answer: B

Explanation: `append()` — this correctly answers the question.

15. Which function is used to add an element at a specific position in a Python list?

(A) `append()`
(B) `remove()`
(C) `insert()`
(D) `pop()`

Correct Answer: C

Explanation: `insert()` — this correctly answers the question.

16. Why is updating code easier in functional programming?

(A) Because the code is shorter
(B) Because the code is written in Python
(C) Because there are no functions
(D) Because only the relevant function(s) need to be modified

Correct Answer: D

Explanation: Updating is easier because only the relevant function(s) need to be modified; the whole program does not need to be read again.

17. Which of the following is a disadvantage of functional programming?

(A) May involve overhead with large data structures
(B) Simpler code
(C) Easier to debug
(D) Functions are easier to test

Correct Answer: A

Explanation: Functional programming may involve overhead, especially when handling large data structures.

18. Which of the following is an advantage of OOP?

(A) It is always faster
(B) It simplifies complex systems by breaking them into reusable components
(C) It eliminates the need for functions
(D) It cannot model real-world objects

Correct Answer: B

Explanation: It simplifies complex systems by breaking them into reusable components — this correctly answers the question.

19. Which of the following is a disadvantage of OOP?

(A) It cannot model real-world objects
(B) It does not support encapsulation
(C) It may result in complex designs if not implemented thoughtfully
(D) It cannot use functions

Correct Answer: C

Explanation: It may result in complex designs if not implemented thoughtfully — this correctly answers the question.

20. In the bank example, which method retrieves the current balance without changing it?

(A) `deposit(amount)`
(B) `withdraw(amount)`
(C) `set_balance()`
(D) `get_balance()`

Correct Answer: D

Explanation: `get_balance()` — this correctly answers the question.

21. Which OOP concept is illustrated by a 'Car' inheriting attributes from a 'Vehicle'?

(A) Inheritance
(B) Encapsulation
(C) Abstraction
(D) Polymorphism

Correct Answer: A

Explanation: A 'Car' inheriting from a 'Vehicle' illustrates inheritance.

22. Which OOP concept is illustrated by different shapes having their own `calculateArea()` method?

(A) Encapsulation
(B) Polymorphism
(C) Abstraction
(D) Inheritance

Correct Answer: B

Explanation: Polymorphism — this correctly answers the question.

23. What happens if you try to remove a value that is not in a Python list?

(A) Nothing happens
(B) The list is cleared
(C) A `ValueError` is raised
(D) The program crashes silently

Correct Answer: C

Explanation: Trying to remove a value that is not in the list raises a `ValueError`.

24. What is the index of the first element in a Python list?

(A) 1
(B) -1
(C) Depends on the list
(D) 0

Correct Answer: D

Explanation: In Python, indexing starts at 0, so the first element is at index 0.

25. Which of the following is true about Python lists?

(A) They can store different data types
(B) They can only store integers
(C) They have a fixed size
(D) They cannot be changed after creation

Correct Answer: A

Explanation: Python lists can store different data types and are mu.

B. Less Important / Secondary Topics

26. Why is it good practice to use a conditional statement before removing a value from a list?

(A) To prevent a `ValueError` if the value is not in the list
(B) To make the code run faster
(C) To add a new value
(D) To sort the list

Correct Answer: A

Explanation: To prevent a `ValueError` if the value is not in the list — this correctly answers the question.

27. How do you calculate the average of a list of numbers in Python without using a loop?

(A) Using `average()` function
(B) Using `sum()` and `len()`
(C) Using `mean()` function
(D) Using `avg()` function

Correct Answer: B

Explanation: The average is calculated using `sum(list) / len(list)`.

28. What is a tuple in Python?

(A) A mutable list
(B) A type of dictionary
(C) An immutable list
(D) A type of function

Correct Answer: C

Explanation: A tuple is a special type of list in Python that is immu.

29. How is a tuple created in Python?

(A) Using square brackets `[]`
(B) Using curly braces `{}`
(C) Using angle brackets `<>`
(D) Using parentheses `()`

Correct Answer: D

Explanation: Tuples are created using parentheses `()`.

30. Can you add an element to a tuple after it is created?

(A) No, tuples are immutable
(B) Yes, using `append()`
(C) Yes, using `insert()`
(D) Yes, using `add()`

Correct Answer: A

Explanation: No, tuples are immutable — this correctly answers the question.

31. How do you access the first element of a tuple named `grades`?

(A) `grades[1]`
(B) `grades[0]`
(C) `grades.first()`
(D) `grades.get(0)`

Correct Answer: B

Explanation: Indexing starts at 0, so the first element is `grades[0]`.

32. Which operator is used to check if a value exists in a tuple?

(A) `==`
(B) `exists`
(C) `in`
(D) `contains`

Correct Answer: C

Explanation: `in` — this correctly answers the question.

33. What does `grades.count(92)` return if `92` appears twice in the tuple?

(A) 1
(B) 3
(C) 0
(D) 2

Correct Answer: D

Explanation: 2 — this correctly answers the question.

34. What happens when you concatenate two tuples using `+`?

(A) A new tuple is created
(B) The first tuple is modified
(C) The second tuple is modified
(D) The tuples are merged into a list

Correct Answer: A

Explanation: Concatenation creates a new tuple; the original tuples are not modified.

35. Which of the following is a valid single-element tuple?

(A) `(5)`
(B) `(5,)`
(C) `[5]`
(D) `{5}`

Correct Answer: B

Explanation: `(5,)` — this correctly answers the question.

36. A student writes a function that works for normal inputs but fails for an empty list. Which programming construct would help catch this issue early?

(A) A `while` loop
(B) An `if` statement
(C) A unit test with an edge case
(D) A `print()` statement

Correct Answer: C

Explanation: Unit tests with edge cases (like an empty list) catch bugs early, ensuring the function works for all valid inputs.

37. A programmer wants to store a student's name, registration number, and marks in a single structure, with the ability to look up the record by name. Which Python construct is most suitable?

(A) A list of integers
(B) A tuple of strings
(C) A set of names
(D) A dictionary with the name as the key and a list of details as the value

Correct Answer: D

Explanation: A dictionary allows lookup by key (name), and a list as the value allows storing multiple details per student.

38. A programmer needs to store a fixed set of values that must not change during program execution, such as the days of the week. Which Python construct is most suitable?

(A) Tuple
(B) List
(C) Set
(D) Dictionary

Correct Answer: A

Explanation: Tuple — this correctly answers the question.

39. A programmer needs to remove all duplicate values from a list. Which Python construct is most suitable?

(A) Tuple
(B) Set
(C) Dictionary
(D) Stack

Correct Answer: B

Explanation: A set automatically removes duplicates, making it ideal for removing duplicate values.

40. A student writes a class `Rectangle` with private attributes and methods to calculate area and perimeter. Which OOP principle is being applied?

(A) Inheritance
(B) Polymorphism
(C) Encapsulation
(D) Abstraction

Correct Answer: C

Explanation: Encapsulation hides data and combines it with methods, as seen in the `Rectangle` class with private attributes.

41. A program defines a base class `Vehicle` and derived classes `Car` and `Bike`, each with its own `start()` method. Which OOP principle is being applied?

(A) Encapsulation
(B) Abstraction
(C) Inheritance
(D) Polymorphism

Correct Answer: D

Explanation: Polymorphism allows different classes (`Car`, `Bike`) to be treated as instances of a common type (`Vehicle`) with their own implementations.

42. Which of the following best explains why functional programming naturally supports parallel and concurrent programming?

(A) Because functions are independent and can be executed simultaneously
(B) Because functions are always fast
(C) Because functions do not use data
(D) Because functions are written in Python

Correct Answer: A

Explanation: In functional programming, functions are independent and can be executed simultaneously, supporting parallel and concurrent programming.

43. A student writes a function that calculates the factorial of a number using recursion. Which paradigm does this best align with?

(A) Object-Oriented Programming
(B) Functional Programming
(C) Procedural Programming
(D) Structural Programming

Correct Answer: B

Explanation: Recursive functions are a common feature of functional programming, where the solution is expressed as a series of function calls.

44. A programmer needs to store a list of unique usernames and quickly check if a username already exists. Which Python construct is most suitable?

(A) List
(B) Tuple
(C) Set
(D) Dictionary

Correct Answer: C

Explanation: A set stores unique values and provides fast membership testing, making it ideal for checking if a username exists.

45. A programmer wants to store a matrix (2D grid of numbers) in Python. Which construct is most suitable?

(A) A flat list
(B) A tuple
(C) A set

(D) A nested list

Correct Answer: D

Explanation: A nested list (list of lists) can represent a 2D matrix, with rows and columns accessible by indexes.

46. A programmer needs to store a dictionary where each key (student name) maps to multiple values (marks in different subjects). Which construct is most suitable?

(A) A dictionary with lists as values
(B) A list of tuples
(C) A set of strings
(D) A flat dictionary with single values

Correct Answer: A

Explanation: A dictionary with lists as values allows multiple pieces of data to be stored under a single key, such as marks in different subjects per student.

47. A student wants to count how many times the letter 'a' appears in a string. Which approach is most suitable?

(A) Using a `while` loop
(B) Using a `for` loop and a counter
(C) Using a recursive function
(D) Using a `print()` statement

Correct Answer: B

Explanation: Iterating through each character with a `for` loop and incrementing a counter is the simplest approach.

48. A programmer is designing a system where multiple objects of different types (e.g., `Circle`, `Rectangle`) must respond to a common operation (e.g., `draw()`). Which OOP principle is most relevant?

(A) Encapsulation
(B) Abstraction
(C) Polymorphism
(D) Inheritance

Correct Answer: C

Explanation: Polymorphism allows different objects to be treated as instances of a common type and respond to the same operation in their own way.

49. A programmer wants to store data in a file so that it persists after the program ends. Which Python construct is most suitable?

(A) A list
(B) A tuple
(C) A set
(D) A file (using `open()` and `write()`)

Correct Answer: D

Explanation: A file (using `open()` and `write()`) — this correctly answers the question.

50. A programmer wants to store a list of student records with fields like name, roll number, and marks, and perform operations like adding, removing, and searching records. Which Python construct is most suitable?

(A) A list of dictionaries
(B) A tuple of strings
(C) A set of integers
(D) A single dictionary with one key

Correct Answer: A

Explanation: A list of dictionaries allows each record to be a dictionary with key-value pairs (name, roll number, marks), with the list allowing multiple records.

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Computer Science Grade 12 — Chapter 4

Data and Analysis

by Public Library

Independent practice MCQs from the supplied Class 12 Computer Science notes pack. Total: 50 questions.

A. Important / Main Topics

1. Which of the following is numerical data?

(A) Age
(B) Gender
(C) Color
(D) True/False

Correct Answer: A

Explanation: Age is numerical (quantitative) data because it represents a numerical value.

2. Which type of data has only two possible values?

(A) Numerical
(B) Boolean
(C) Categorical
(D) Text

Correct Answer: B

Explanation: Boolean — this correctly answers the question.

3. Which type of data is organized in rows and columns?

(A) Unstructured
(B) Semi-structured
(C) Structured
(D) Text

Correct Answer: C

Explanation: Structured data is organized in the form of rows and columns.

4. Which of the following is an example of unstructured data?

(A) Spreadsheet
(B) Database
(C) XML
(D) Video

Correct Answer: D

Explanation: Videos are unstructured data because they have no predefined structure.

5. Data visualization is best defined as:

(A) The graphical representation of information and data
(B) The process of collecting data
(C) The process of storing data
(D) The process of deleting data

Correct Answer: A

Explanation: Data visualization is the graphical representation of information and data.

6. Which Python libraries are used for data visualization?

(A) NumPy and Pandas
(B) Matplotlib and Seaborn
(C) TensorFlow and Keras
(D) Django and Flask

Correct Answer: B

Explanation: Matplotlib and Seaborn are Python libraries used for data visualization.

7. Data storytelling is best defined as:

(A) Writing a story about data
(B) Collecting data for a story
(C) Using visuals to communicate insights from data
(D) Deleting data

Correct Answer: C

Explanation: Data storytelling uses visuals to communicate insights, combining charts, graphs, and narratives.

8. Which of the following is a measure of central tendency?

(A) Range
(B) Standard deviation
(C) Variance
(D) Mean

Correct Answer: D

Explanation: Mean is a measure of central tendency, along with median and mode.

9. The mean of a dataset is:

(A) The average value of the data set
(B) The middle value when data is ordered
(C) The most frequent value
(D) The difference between highest and lowest values

Correct Answer: A

Explanation: The mean is the average value of the data set.

10. The median of a dataset is:

(A) The average value
(B) The middle value when data is ordered
(C) The most frequent value
(D) The difference between highest and lowest values

Correct Answer: B

Explanation: The median is the middle value when data is ordered.

11. The mode of a dataset is:

(A) The average value
(B) The middle value
(C) The most frequent value in the data
(D) The difference between highest and lowest values

Correct Answer: C

Explanation: The mode is the most frequent value in the data.

12. The range of a dataset is:

(A) The average value
(B) The middle value
(C) The most frequent value
(D) The difference between the highest and lowest values

Correct Answer: D

Explanation: The range is the difference between the highest and lowest values.

13. Which of the following is a key element of a data story?

(A) Relatable character
(B) Random numbers
(C) Complex equations
(D) Technical jargon

Correct Answer: A

Explanation: Relatable character — this correctly answers the question.

14. Hypothesis formulation is best defined as:

(A) Collecting data
(B) Making an educated guess about a relationship between variables
(C) Analyzing data
(D) Deleting data

Correct Answer: B

Explanation: Hypothesis formulation is the process of making an educated guess or assumption about a relationship between variables.

15. The null hypothesis (H□) states that:

(A) There is a significant effect or relationship
(B) The data is invalid
(C) There is no effect or relationship
(D) The hypothesis is proven

Correct Answer: C

Explanation: The null hypothesis states that there is no effect or relationship between variables.

16. How does continuous learning affect a machine learning model?

(A) It reduces the model's accuracy over time
(B) It makes the model slower to process data
(C) It simplifies the model's decision-making process
(D) It helps the model improve its performance by adapting to new data

Correct Answer: D

Explanation: It helps the model improve its performance by adapting to new data — this correctly answers the question.

17. What is feature engineering?

(A) Transforming and selecting relevant data features
(B) Collecting raw data
(C) Testing the model's accuracy
(D) Calculating the significance of the model

Correct Answer: A

Explanation: Transforming and selecting relevant data features — this correctly answers the question.

18. What is the main advantage of machine learning over rule-based algorithms?

(A) It requires fewer resources
(B) It can learn from data and adapt
(C) It is simpler to implement
(D) It does not require data

Correct Answer: B

Explanation: Machine learning can learn from data and adapt over time, unlike rule-based algorithms.

19. What is overfitting in machine learning?

(A) A model that is too simple
(B) A model that performs well on all data
(C) A model that learns the training data too well
(D) A model that does not learn at all

Correct Answer: C

Explanation: Overfitting happens when a model learns the training data too well, including noise, and performs poorly on new data.

20. What is underfitting in machine learning?

(A) A model that is too complex
(B) A model that learns the training data too well

(C) A model that performs well on all data
(D) A model that is too simple and fails to capture patterns

Correct Answer: D

Explanation: Underfitting occurs when a model is too simple and fails to capture underlying patterns, performing poorly on all data.

21. What is the test-train split used for?

(A) Dividing data into training and test portions
(B) Splitting the algorithm into two parts
(C) Dividing the model into two layers
(D) Splitting the output into two categories

Correct Answer: A

Explanation: A test-train split divides data into training (main) and test (smaller) portions for model evaluation.

22. What is supervised learning?

(A) Learning from unlabeled data
(B) Learning from labeled data
(C) Learning through rewards and penalties
(D) Learning without data

Correct Answer: B

Explanation: Supervised learning uses labeled data, where the correct output is provided for each input.

23. What is unsupervised learning?

(A) Learning from labeled data
(B) Learning through rewards and penalties
(C) Learning from unlabeled data
(D) Learning without data

Correct Answer: C

Explanation: Learning from unlabeled data — this correctly answers the question.

24. What is reinforcement learning?

(A) Learning from labeled data
(B) Learning from unlabeled data
(C) Learning without data
(D) Learning through rewards and penalties

Correct Answer: D

Explanation: Reinforcement learning involves a model that learns by interacting with an environment, receiving feedback in the form of rewards or penalties.

25. What is the formula for accuracy?

(A) Correct Predictions / Total Predictions
(B) True Positives / (True Positives + False Positives)
(C) Total Predictions / Correct Predictions
(D) False Positives / True Positives

Correct Answer: A

Explanation: Accuracy = Correct Predictions / Total Predictions.

B. Less Important / Secondary Topics

26. What is the formula for precision?

(A) True Positives / (True Positives + False Positives)
(B) Correct Predictions / Total Predictions
(C) False Positives / True Positives
(D) Total Predictions / Correct Predictions

Correct Answer: A

Explanation: True Positives / (True Positives + False Positives) — this correctly answers the question.

27. Which of the following is a measure of dispersion?

(A) Mean
(B) Standard deviation
(C) Median
(D) Mode

Correct Answer: B

Explanation: Standard deviation is a measure of dispersion, along with range and variance.

28. What does frequency distribution show?

(A) The average value
(B) The middle value
(C) How often each value occurs
(D) The difference between highest and lowest

Correct Answer: C

Explanation: Frequency distribution shows how often each value occurs in the data set.

29. Which measure is most affected by outliers?

(A) Median
(B) Mode
(C) Range
(D) Mean

Correct Answer: D

Explanation: The mean is most affected by outliers because it uses all values in its calculation.

30. Which measure is least affected by outliers?

(A) Median
(B) Mean
(C) Standard deviation
(D) Variance

Correct Answer: A

Explanation: The median is least affected by outliers because it only depends on the middle value.

31. What is data storytelling used for?

(A) To delete data
(B) To communicate insights from data
(C) To store data
(D) To encrypt data

Correct Answer: B

Explanation: Data storytelling uses visuals and narrative to communicate insights from data.

32. In a data story, what is the "call to action"?

(A) The data itself
(B) The character in the story
(C) A clear suggestion for what the audience should do next
(D) The chart used in the story

Correct Answer: C

Explanation: The call to action is a clear suggestion for what the audience should do next.

33. What is the purpose of formulating questions in data analysis?

(A) To make the analysis longer
(B) To eliminate the need for data
(C) To make the data more complex
(D) To guide data exploration and analysis

Correct Answer: D

Explanation: Formulating questions guides data exploration and analysis, ensuring the analysis is meaningful and directed.

34. What is the first step in the data analysis process?

(A) Formulating questions
(B) Identifying relevant data sets
(C) Evaluating data quality
(D) Refining questions

Correct Answer: A

Explanation: The first step is to formulate questions that guide the analysis.

35. Why is data quality important in data analysis?

(A) It makes the data more complex
(B) It ensures data accuracy and relevance
(C) It deletes data
(D) It stores data

Correct Answer: B

Explanation: Data quality ensures that the data is accurate and relevant, leading to reliable insights.

36. A model shows 98% accuracy, but precision and recall are both below 60%. What is the most likely issue?

(A) The model is underfitting
(B) The model is overfitting
(C) The data is imbalanced
(D) Labels are missing in training data

Correct Answer: C

Explanation: The data is imbalanced — this correctly answers the question.

37. A retail analyst wants to segment customers to discover hidden shopping patterns without any labeled categories. Which approach is most appropriate?

(A) Logistic regression
(B) Decision trees
(C) Linear regression
(D) Clustering

Correct Answer: D

Explanation: Clustering is an unsupervised learning technique that groups similar data points without labeled categories.

38. A machine learning model performs very well on training data but poorly on test data. What is the most likely cause?

(A) Overfitting
(B) Underfitting
(C) Data imbalance
(D) Missing labels

Correct Answer: A

Explanation: Overfitting occurs when a model learns the training data too well, including noise, and performs poorly on new, unseen data.

39. A company wants to predict house prices based on features like area, number of bedrooms, and location. Which type of learning is most appropriate?

(A) Unsupervised learning
(B) Supervised learning (regression)
(C) Reinforcement learning
(D) Clustering

Correct Answer: B

Explanation: Predicting continuous values like house prices is a regression problem, a type of supervised learning.

40. A researcher formulates a hypothesis that "increased study hours lead to better exam scores." What type of relationship does this hypothesis propose?

(A) Correlation
(B) Random
(C) Cause-and-effect
(D) No relationship

Correct Answer: C

Explanation: The hypothesis proposes a cause-and-effect relationship between study hours (cause) and exam scores (effect).

41. A study finds a p-value of 0.02 for the difference in plant height between fertilized and non-fertilized plants. What does this suggest?

(A) The difference is likely due to chance
(B) The data is invalid
(C) The fertilizer had no effect
(D) The difference is unlikely to be due to chance

Correct Answer: D

Explanation: A small p-value (0.02) suggests the difference is unlikely due to chance, providing evidence that the fertilizer had an effect.

42. A p-value of 0.5 is found in a study. What does this suggest?

(A) Weak evidence against the null hypothesis; the result could be due to chance
(B) Strong evidence against the null hypothesis
(C) The null hypothesis is proven true
(D) The alternative hypothesis is proven true

Correct Answer: A

Explanation: Weak evidence against the null hypothesis; the result could be due to chance — this correctly answers the question.

43. A company tests two versions of a website (A and B) to see which one leads to more sales. Which method is most appropriate?

(A) Clustering
(B) A/B testing
(C) Regression
(D) Qualitative testing

Correct Answer: B

Explanation: A/B testing compares two versions of a system to see which one performs better.

44. In the context of hypothesis testing, what is a Type I error?

(A) Failing to reject a false null hypothesis
(B) Rejecting a false null hypothesis
(C) Rejecting a true null hypothesis
(D) Failing to reject a true null hypothesis

Correct Answer: C

Explanation: A Type I error occurs when a true null hypothesis is incorrectly rejected (false positive).

45. In the context of hypothesis testing, what is a Type II error?

(A) Rejecting a true null hypothesis
(B) Rejecting a false null hypothesis
(C) Failing to reject a true null hypothesis
(D) Failing to reject a false null hypothesis

Correct Answer: D

Explanation: A Type II error happens when a false null hypothesis is not rejected (false negative).

46. What is power in hypothesis testing?

(A) The ability to detect an effect if one exists
(B) The probability of a Type I error
(C) The probability of a Type II error
(D) The average of the data

Correct Answer: A

Explanation: The ability to detect an effect if one exists — this correctly answers the question.

47. A larger sample size generally:

(A) Decreases power
(B) Increases power and reliability
(C) Has no effect on power
(D) Deletes data

Correct Answer: B

Explanation: A larger sample size generally Increases power and reliability.

48. A researcher wants to reduce the chance of a Type I error. What should they do?

(A) Increase the significance level (α)
(B) Increase the sample size
(C) Decrease the significance level (α)
(D) Decrease the sample size

Correct Answer: C

Explanation: Decrease the significance level (α) — this correctly answers the question.

49. A researcher wants to increase the power of a hypothesis test. Which of the following would help?

(A) Decrease the sample size
(B) Increase the significance level only
(C) Decrease the effect size
(D) Increase the sample size

Correct Answer: D

Explanation: Increase the sample size — this correctly answers the question.

50. In the coffee and productivity example, if the p-value is less than the significance level (α = 0.05), what is the correct decision?

(A) Reject H□ and accept H□
(B) Fail to reject H□
(C) Accept H□
(D) Ignore the results

Correct Answer: A

Explanation: If the p-value is less than the significance level, the null hypothesis is rejected, and the alternative hypothesis is accepted.

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Computer Science Grade 12 — Chapter 5

Applications of Computer Science

by Public Library

Independent practice MCQs from the supplied Class 12 Computer Science notes pack. Total: 50 questions.

A. Important / Main Topics

1. IoT is best defined as:

(A) A network of physical devices connected through the Internet
(B) A type of software
(C) A type of database
(D) A programming language

Correct Answer: A

Explanation: IoT is a network of physical devices connected through the Internet for communication with each other.

2. Which of the following is an example of an IoT device?

(A) Desktop computer without internet
(B) Smart watch
(C) Notebook
(D) Pencil

Correct Answer: B

Explanation: A smart watch is an IoT device because it connects to the internet and communicates with other devices.

3. What is the status of IoT in Pakistan?

(A) Fully implemented
(B) Not used at all
(C) Early stage of planning and implementation
(D) Only used in homes

Correct Answer: C

Explanation: In Pakistan, IoT is at an early stage of planning and implementation.

4. Which of the following is a benefit of IoT?

(A) Decreased efficiency
(B) Increased energy consumption
(C) Reduced automation
(D) Improved productivity

Correct Answer: D

Explanation: Improved productivity — this correctly answers the question.

5. Blockchain is best defined as:

(A) A decentralized, distributed ledger of records
(B) A type of cryptocurrency
(C) A traditional database
(D) A programming language

Correct Answer: A

Explanation: Blockchain is a decentralized, distributed ledger of records or transactions shared among many network users.

6. Cloud computing is best defined as:

(A) A type of hardware
(B) The use of hosted services over the Internet
(C) A programming language

(D) A type of network

Correct Answer: B

Explanation: Cloud computing is the use of hosted services such as servers, data storage, databases, networking, and software over the Internet.

7. Which of the following is a benefit of cloud computing?

(A) Increased infrastructure costs
(B) Limited accessibility
(C) Cost savings
(D) Decreased collaboration

Correct Answer: C

Explanation: Cloud computing provides cost savings by eliminating the need for expensive on-premises infrastructure.

8. Neural networks are best defined as:

(A) A type of database
(B) A programming language
(C) A type of network
(D) Simulations of the working of the human brain

Correct Answer: D

Explanation: Neural networks are simulations of the working of the human brain, based on the functioning of neurons.

9. Deep learning is best defined as:

(A) Neural networks with multiple hidden layers
(B) A type of database
(C) A programming language
(D) A type of network

Correct Answer: A

Explanation: Deep learning uses deep neural networks with multiple hidden layers.

10. Data sharing is best defined as:

(A) Deleting data
(B) Making data available to multiple users, applications, and organizations
(C) Encrypting data
(D) Storing data

Correct Answer: B

Explanation: Data sharing means making the same data available to multiple users, applications, and organizations.

11. Data privacy is best defined as:

(A) Making data available to everyone
(B) Deleting data
(C) The ability of a person to control their personal information
(D) Encrypting data

Correct Answer: C

Explanation: Data privacy is the ability of a person to control their personal information and know when, how, and what personal information is shared with others.

12. What does GDPR stand for?

(A) Global Data Privacy Rules
(B) General Data Privacy Regulations
(C) Global Data Protection Rules
(D) General Data Protection Regulations

Correct Answer: D

Explanation: GDPR stands for General Data Protection Regulations.

13. Which of the following is a blockchain application applicable to Pakistan?

(A) All of the above
(B) Voting
(C) Healthcare
(D) Banking

Correct Answer: A

Explanation: Voting, healthcare, and banking are all blockchain applications applicable to Pakistan.

14. Which of the following is a cloud computing application applicable to Pakistan?

(A) Education
(B) All of the above
(C) Healthcare
(D) Government

Correct Answer: B

Explanation: Education, healthcare, and government are all cloud computing applications applicable to Pakistan.

15. Which of the following is a deep learning application?

(A) Natural Language Processing
(B) Healthcare
(C) All of the above
(D) Fraud Detection

Correct Answer: C

Explanation: Natural Language Processing, healthcare, and fraud detection are all applications of deep learning.

16. How does IoT improve productivity and efficiency?

(A) By deleting data
(B) By storing data
(C) By ignoring users
(D) By automating processes and enabling remote control

Correct Answer: D

Explanation: By automating processes and enabling remote control — this correctly answers the question.

17. What role do sensors play in IoT?

(A) They collect data from the environment
(B) They delete data
(C) They store data
(D) They encrypt data

Correct Answer: A

Explanation: Sensors collect data from the environment, enabling automation and control.

18. How does IoT help with energy savings?

(A) By increasing energy consumption
(B) By automating tasks like turning off lights
(C) By reducing automation
(D) By making devices slower

Correct Answer: B

Explanation: IoT helps save energy by automating tasks like turning off lights when no one is in a room.

19. Which of the following is an example of a smart home device?

(A) Traditional notebook
(B) Pencil
(C) Smart TV
(D) Paper

Correct Answer: C

Explanation: A smart TV is an example of a smart home device.

20. Which of the following is a benefit of smart agriculture?

(A) Increased production cost
(B) Reduced productivity
(C) Ignoring weather conditions
(D) Proper knowledge of climate through sensors

Correct Answer: D

Explanation: Smart agriculture uses sensors to observe real-time weather conditions, making farming more controlled, precise, and efficient.

21. What is the purpose of the NDMA mobile app?

(A) To provide early warnings and advisories for disasters
(B) To increase disaster damage
(C) To ignore disasters
(D) To delete disaster data

Correct Answer: A

Explanation: To provide early warnings and advisories for disasters — this correctly answers the question.

22. How does blockchain improve the voting system?

(A) By increasing rigging
(B) By ensuring security and integrity
(C) By making voting slower
(D) By deleting votes

Correct Answer: B

Explanation: Blockchain can transform the voting system by ensuring security and integrity, preventing fraudulent activities.

23. How does blockchain improve healthcare?

(A) By increasing data breaches
(B) By deleting patient data
(C) By providing increased privacy, transparency, and accessibility for patient data
(D) By ignoring patient data

Correct Answer: C

Explanation: Blockchain provides increased privacy, transparency, and accessibility for patient data.

24. How does blockchain improve the banking industry?

(A) By increasing fraud
(B) By deleting transactions
(C) By ignoring security
(D) By making operations more secure, transparent, efficient, and cost-effective

Correct Answer: D

Explanation: By making operations more secure, transparent, efficient, and cost-effective — this correctly answers the question.

25. How does blockchain improve education?

(A) By making record-keeping more efficient, secure, and transparent
(B) By increasing fake credentials
(C) By deleting records
(D) By ignoring verification

Correct Answer: A

Explanation: By making record-keeping more efficient, secure, and transparent — this correctly answers the question.

B. Less Important / Secondary Topics

26. How is cloud computing used in the education sector?

(A) To streamline administrative tasks and enable online learning

(B) To increase administrative tasks
(C) To delete records
(D) To ignore students

Correct Answer: A

Explanation: To streamline administrative tasks and enable online learning — this correctly answers the question.

27. How is cloud computing used in healthcare?

(A) To increase disease
(B) To enable real-time access to medical records and telemedicine
(C) To delete records
(D) To ignore patients

Correct Answer: B

Explanation: To enable real-time access to medical records and telemedicine — this correctly answers the question.

28. What is a neural network?

(A) A type of database
(B) A programming language
(C) A simulation of the human brain
(D) A type of network

Correct Answer: C

Explanation: A neural network is a simulation of the working of the human brain.

29. What are the three layers of a neural network?

(A) Data, Process, Result
(B) Start, Middle, End
(C) Left, Center, Right
(D) Input, Hidden, Output

Correct Answer: D

Explanation: The three layers of a neural network are the input layer, hidden layers, and output layer.

30. What do weights in a neural network represent?

(A) Numerical values associated with connections between neurons
(B) The number of neurons
(C) The type of activation function
(D) The size of the network

Correct Answer: A

Explanation: Weights are numerical values associated with connections between neurons, determining the influence of one neuron's output on another.

31. What is the purpose of biases in a neural network?

(A) To increase the number of layers
(B) To provide adaptability and flexibility
(C) To decrease the number of neurons
(D) To change the activation function

Correct Answer: B

Explanation: To provide adaptability and flexibility — this correctly answers the question.

32. What does an activation function determine?

(A) The number of layers
(B) The number of neurons
(C) Whether a neuron should be activated
(D) The type of data

Correct Answer: C

Explanation: An activation function determines whether a neuron should be activated based on the input.

33. What does a loss function measure?

(A) The number of layers
(B) The number of neurons
(C) The type of data
(D) How well the neural network is performing

Correct Answer: D

Explanation: How well the neural network is performing — this correctly answers the question.

34. What is feedforward propagation?

(A) Information is fed in the forward direction
(B) Information is fed in the backward direction
(C) Information is deleted
(D) Information is ignored

Correct Answer: A

Explanation: Feedforward propagation is the process where information is fed in the forward direction from input to output.

35. What is backpropagation?

(A) Weights are deleted
(B) Weights are modified to minimize the loss
(C) Weights are ignored
(D) Weights are increased randomly

Correct Answer: B

Explanation: Weights are modified to minimize the loss — this correctly answers the question.

36. A city wants to monitor air pollution in real time using IoT sensors. Which combination of technologies would be most effective?

(A) IoT sensors only
(B) Cloud computing only
(C) IoT sensors + cloud computing + blockchain
(D) Blockchain only

Correct Answer: C

Explanation: IoT sensors + cloud computing + blockchain — this correctly answers the question.

37. A hospital wants to securely store patient records using blockchain. Which feature of blockchain ensures that records cannot be altered?

(A) Decentralization
(B) Transparency
(C) Scalability
(D) Immutability

Correct Answer: D

Explanation: Immutability ensures that once data is recorded on the blockchain, it cannot be changed, protecting patient records.

38. A bank wants to prevent financial fraud using blockchain. Which feature of blockchain is most relevant?

(A) Immutability
(B) Scalability
(C) Anonymity
(D) Flexibility

Correct Answer: A

Explanation: Immutability prevents transactions from being altered, eliminating financial fraud.

39. A university wants to eliminate fake degrees using blockchain. Which feature of blockchain is most relevant?

(A) Scalability

(B) Immutability
(C) Anonymity
(D) Flexibility

Correct Answer: B

Explanation: Immutability ensures that degrees and certificates cannot be altered or forged.

40. A government wants to provide online services to citizens using cloud computing. Which benefit is most relevant?

(A) Increased infrastructure costs
(B) Limited accessibility
(C) Improved service delivery
(D) Decreased collaboration

Correct Answer: C

Explanation: Improved service delivery — this correctly answers the question.

41. A company wants to reduce its IT infrastructure costs. Which cloud computing benefit is most relevant?

(A) Increased infrastructure costs
(B) Limited accessibility
(C) Decreased collaboration
(D) Cost savings

Correct Answer: D

Explanation: Cloud computing reduces costs by eliminating the need for expensive on-premises infrastructure.

42. A startup wants to build a model that can recognize images of cats and dogs. Which type of learning is most appropriate?

(A) Supervised learning (classification)
(B) Unsupervised learning
(C) Reinforcement learning
(D) Clustering

Correct Answer: A

Explanation: Image recognition with labeled data (cats and dogs) is a classification problem, a type of supervised learning.

43. A healthcare provider wants to use deep learning to diagnose diseases from medical images. Which application of deep learning is most relevant?

(A) Natural Language Processing
(B) Healthcare
(C) Fraud Detection
(D) Entertainment

Correct Answer: B

Explanation: Deep learning is used for diagnosis of diseases through medical imaging.

44. A company wants to use deep learning to detect suspicious login attempts. Which application of deep learning is most relevant?

(A) Healthcare
(B) Natural Language Processing
(C) Fraud Detection
(D) Entertainment

Correct Answer: C

Explanation: Deep learning is used for fraud detection, such as detecting suspicious login attempts.

45. A media company wants to personalize recommendations for its users. Which application of deep learning is most relevant?

(A) Healthcare

(B) Fraud Detection
(C) Natural Language Processing
(D) Entertainment

Correct Answer: D

Explanation: Deep learning is used in entertainment platforms for content personalization.

46. A student claims that "data sharing and data privacy are always in conflict." Which statement best evaluates this claim?

(A) The claim is partially correct; they often conflict, but can be balanced with proper policies and techniques
(B) The claim is fully correct
(C) The claim is incorrect; they never conflict
(D) The claim is irrelevant to computing

Correct Answer: A

Explanation: Data sharing and privacy often conflict, but they can be balanced with techniques like data minimization and anonymization.

47. A hospital wants to share patient data for research while protecting privacy. Which technique is most appropriate?

(A) Data duplication
(B) Data anonymization
(C) Data deletion
(D) Data encryption only

Correct Answer: B

Explanation: Data anonymization removes personally identifiable information, allowing data to be used for research while protecting privacy.

48. A company wants to ensure that its data collection is limited to what is necessary. Which technique is most appropriate?

(A) Data duplication
(B) Data anonymization
(C) Data minimization
(D) Data encryption only

Correct Answer: C

Explanation: Data minimization limits the collection of personal information to what is necessary to accomplish a specified purpose.

49. Which of the following is a principle of the OECD on data sharing and privacy?

(A) There should be no limits on data collection
(B) Personal data should be inaccurate
(C) Data should be used for any purpose
(D) There should be limits to how much personal data can be collected

Correct Answer: D

Explanation: One of the OECD principles is that there should be limits to how much personal data can be collected.

50. Which combination of technologies is used in the flood management example from the textbook?

(A) IoT, cloud computing, and blockchain
(B) IoT only
(C) Cloud computing only
(D) Blockchain only

Correct Answer: A

Explanation: The flood management example combines IoT sensors, cloud computing for data processing, and blockchain for secure record-keeping.

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Computer Science Grade 12 — Chapter 6

Impacts of Computing

by Public Library

Independent practice MCQs from the supplied Class 12 Computer Science notes pack. Total: 50 questions.

A. Important / Main Topics

1. Security protocols are best defined as:

(A) Rules and procedures to protect data and communication on networks
(B) Types of databases
(C) Programming languages
(D) Types of networks

Correct Answer: A

Explanation: Security protocols are rules and procedures to protect data and communication on networks.

2. What does confidentiality ensure?

(A) Data is accessible to everyone
(B) Data is accessible only to authorized parties
(C) Data is deleted
(D) Data is ignored

Correct Answer: B

Explanation: Confidentiality ensures that data is accessible only to authorized parties.

3. What does data integrity ensure?

(A) Information is changed frequently
(B) Information is deleted
(C) Information remains accurate, consistent, and unaltered
(D) Information is ignored

Correct Answer: C

Explanation: Data integrity ensures that information remains accurate, consistent, and unaltered.

4. What is authentication?

(A) Deleting data
(B) Encrypting data
(C) Storing data
(D) Verifying user or device identities

Correct Answer: D

Explanation: Verifying user or device identities — this correctly answers the question.

5. What is access control?

(A) Deciding who can access, change, or send data
(B) Deleting data
(C) Encrypting data
(D) Storing data

Correct Answer: A

Explanation: Access control decides who can access, change, or send data.

6. What is secure transmission?

(A) Deleting data
(B) Protecting data during transmission
(C) Storing data
(D) Ignoring data

Correct Answer: B

Explanation: Protecting data during transmission — this correctly answers the question.

7. What is data backup and recovery?

(A) Deleting data
(B) Ignoring data
(C) Ensuring data can be restored after loss
(D) Encrypting data

Correct Answer: C

Explanation: Data backup and recovery ensures that data can be brought back if it's lost.

8. What is identity theft?

(A) Sharing personal information with friends
(B) Using someone's personal details with permission
(C) Deleting personal information
(D) Using someone's personal details without permission for fraud

Correct Answer: D

Explanation: Identity theft happens when someone uses your personal details without permission for fraud.

9. Which of the following is a risk of sharing private information?

(A) All of the above
(B) Phishing
(C) Data breaches
(D) Lost or stolen items

Correct Answer: A

Explanation: Phishing, data breaches, and lost or stolen items are all risks of sharing private information.

10. What is phishing?

(A) A type of data breach
(B) Sending fraudulent emails or messages to steal personal information
(C) A type of online scam
(D) A type of lost item

Correct Answer: B

Explanation: Sending fraudulent emails or messages to steal personal information — this correctly answers the question.

11. What is a data breach?

(A) When individuals share data with friends
(B) When data is encrypted
(C) When organizations lose customer data due to cyber attacks
(D) When data is deleted

Correct Answer: C

Explanation: A data breach occurs when organizations or websites are attacked online and lose customer data.

12. Which of the following is a best practice to prevent identity theft?

(A) Share passwords with friends
(B) Ignore financial statements
(C) Use the same password for all accounts
(D) Be careful about sharing personal information

Correct Answer: D

Explanation: Being careful about sharing personal information is a best practice to prevent identity theft.

13. What is a DDoS attack?

(A) Flooding a system with too much traffic
(B) Encrypting files
(C) Stealing information
(D) Deceiving people

Correct Answer: A

Explanation: A DDoS attack floods a system with too much traffic, making it slow or unavailable.

14. What is ransomware?

(A) A type of virus
(B) Malicious software that locks or encrypts files and demands money
(C) A type of spyware
(D) A type of phishing

Correct Answer: B

Explanation: Ransomware is malicious software that locks or encrypts files and demands money to unlock them.

15. What are security methods?

(A) Types of databases
(B) Programming languages
(C) Techniques to protect systems and data from unauthorized access
(D) Types of networks

Correct Answer: C

Explanation: Security methods are techniques and technologies used to protect systems and data from unauthorized access.

16. Why is employee training important for cybersecurity?

(A) It deletes data
(B) It stores data
(C) It ignores security
(D) It helps employees spot phishing attempts

Correct Answer: D

Explanation: It helps employees spot phishing attempts — this correctly answers the question.

17. What does email filtering do?

(A) Catches and blocks phishing emails
(B) Deletes all emails
(C) Stores emails permanently
(D) Ignores emails

Correct Answer: A

Explanation: Catches and blocks phishing emails — this correctly answers the question.

18. What is the purpose of secure communication protocols?

(A) To delete data
(B) To keep communication secure
(C) To store data
(D) To ignore security

Correct Answer: B

Explanation: To keep communication secure — this correctly answers the question.

19. What is web content filtering?

(A) Allowing access to all websites
(B) Deleting websites
(C) Blocking access to known phishing sites
(D) Ignoring websites

Correct Answer: C

Explanation: Blocking access to known phishing sites — this correctly answers the question.

20. Why are security updates important?

(A) They delete data
(B) They store data
(C) They ignore security

(D) They close known vulnerabilities

Correct Answer: D

Explanation: Security updates close known vulnerabilities that attackers could exploit.

21. What is troubleshooting security problems?

(A) Finding and fixing security issues
(B) Deleting data
(C) Storing data
(D) Ignoring security

Correct Answer: A

Explanation: Troubleshooting security problems is the process of finding and fixing security issues to protect systems and apps.

22. What is the first step in troubleshooting security problems?

(A) User education
(B) Identify the issue
(C) Regular backups
(D) Document and learn

Correct Answer: B

Explanation: The first step is to identify the issue.

23. Why is user education important?

(A) It deletes data
(B) It stores data
(C) It prevents human error
(D) It ignores security

Correct Answer: C

Explanation: User education is important because human error is a major cause of security breaches.

24. Why are regular backups important?

(A) They delete data
(B) They ignore security
(C) They store data permanently
(D) They ensure data can be recovered after security incidents

Correct Answer: D

Explanation: Regular backups ensure that data can be recovered if lost due to security problems.

25. Why is security considered an ongoing process?

(A) Because threats evolve constantly
(B) Because security is a one-time task
(C) Because security is not important
(D) Because security is easy

Correct Answer: A

Explanation: Security is an ongoing process because threats evolve constantly, requiring continuous assessment and adjustment.

B. Less Important / Secondary Topics

26. What is a cybersecurity threat?

(A) Any potential danger that could compromise security
(B) A type of database
(C) A programming language
(D) A type of network

Correct Answer: A

Explanation: A cybersecurity threat is any potential danger that could compromise the security of a computer system.

27. Which of the following is a strategy for identifying cybersecurity threats?

(A) Employee training and awareness
(B) All of the above
(C) Email filtering
(D) Web content filtering

Correct Answer: B

Explanation: Employee training, email filtering, and web content filtering are all strategies for identifying cybersecurity threats.

28. What are computational perspectives?

(A) A type of database
(B) A programming language
(C) Using computers to solve problems by breaking down complex tasks
(D) A type of network

Correct Answer: C

Explanation: Using computers to solve problems by breaking down complex tasks — this correctly answers the question.

29. Why are computational perspectives important?

(A) They delete data
(B) They store data
(C) They ignore security
(D) They enhance problem-solving and critical thinking

Correct Answer: D

Explanation: They enhance problem-solving and critical thinking — this correctly answers the question.

30. Which of the following is a key skill in computational perspectives?

(A) All of the above
(B) Decomposition
(C) Pattern recognition
(D) Abstraction

Correct Answer: A

Explanation: Decomposition, pattern recognition, and abstraction are all key skills in computational perspectives.

31. What are computing applications?

(A) Types of databases
(B) Software programs and systems designed to perform specific tasks
(C) Programming languages
(D) Types of networks

Correct Answer: B

Explanation: Computing applications are software programs and systems designed to perform specific tasks.

32. Why is collaboration important in computing application design?

(A) It deletes data
(B) It stores data
(C) It brings together diverse skills and perspectives
(D) It ignores security

Correct Answer: C

Explanation: It brings together diverse skills and perspectives — this correctly answers the question.

33. What are resources for equal information accessibility?

(A) Types of databases
(B) Programming languages
(C) Types of networks
(D) Tools and projects to give everyone equal access to information

Correct Answer: D

Explanation: Resources for equal information accessibility are tools, projects, and initiatives designed to ensure that everyone has equal access to information.

34. What are digital libraries?

(A) Online libraries with free access to educational materials
(B) Physical libraries
(C) Types of databases
(D) Programming languages

Correct Answer: A

Explanation: Digital libraries are online libraries that offer free access to educational materials.

35. What are collaborative tools?

(A) Types of databases
(B) Software applications designed to facilitate teamwork and communication
(C) Programming languages
(D) Types of networks

Correct Answer: B

Explanation: Collaborative tools are software applications designed to facilitate teamwork and communication among individuals.

36. A company wants to protect data during transmission over the internet. Which protocol is most appropriate?

(A) HTTP
(B) FTP
(C) HTTPS
(D) SMTP

Correct Answer: C

Explanation: HTTPS uses TLS/SSL to secure data during transmission over the internet.

37. A company wants to secure communication between remote offices using a VPN. Which protocol is most appropriate?

(A) HTTP
(B) FTP
(C) SMTP
(D) IPsec

Correct Answer: D

Explanation: IPsec is a set of protocols that secure IP communication and is often used for VPNs.

38. A company wants to ensure that data remains unchanged during transmission. Which security objective is most relevant?

(A) Integrity
(B) Confidentiality
(C) Availability
(D) Usability

Correct Answer: A

Explanation: Integrity ensures that data remains unchanged during transmission, storage, and processing.

39. A company wants to prevent unauthorized access to its systems. Which security objective is most relevant?

(A) Integrity
(B) Confidentiality
(C) Availability
(D) Usability

Correct Answer: B

Explanation: Confidentiality ensures that data is accessible only to authorized parties, preventing unauthorized access.

40. A company wants to ensure that its systems are available when needed. Which security objective is most relevant?

(A) Integrity
(B) Confidentiality
(C) Availability
(D) Usability

Correct Answer: C

Explanation: Availability ensures that systems and data are accessible and usable when needed.

41. A user wants to protect their account with two forms of identification. Which security method is most appropriate?

(A) Single-factor authentication
(B) Password only
(C) PIN only
(D) Two-factor authentication (2FA)

Correct Answer: D

Explanation: Two-factor authentication (2FA) — this correctly answers the question.

42. A company wants to use unique physical traits for identification. Which security method is most appropriate?

(A) Biometric verification
(B) Password authentication
(C) PIN authentication
(D) Token authentication

Correct Answer: A

Explanation: Biometric verification uses unique physical traits like fingerprints or face scans for identification.

43. A company wants to ensure that data remains private during transmission. Which technique is most appropriate?

(A) Decryption
(B) Encryption
(C) Compression
(D) Duplication

Correct Answer: B

Explanation: Encryption converts plaintext to ciphertext, ensuring that data remains private during transmission.

44. A company uses symmetric cryptography for bulk data encryption. What is the main advantage?

(A) It uses two keys
(B) It is slower than asymmetric cryptography
(C) It is fast and efficient for large data volumes
(D) It requires no key

Correct Answer: C

Explanation: Symmetric cryptography is fast and efficient for large data volumes because it uses the same key for encryption and decryption.

45. A company uses asymmetric cryptography for key exchange. What is the main advantage?

(A) It is faster than symmetric cryptography
(B) It uses the same key for encryption and decryption
(C) It requires no key
(D) It solves the key distribution problem

Correct Answer: D

Explanation: Asymmetric cryptography uses a public key for encryption and a private key for decryption, solving the key distribution problem.

46. A company wants to protect against DDoS attacks. Which measure is most appropriate?

(A) Traffic filtering and load balancing
(B) Ignoring the attack
(C) Sharing passwords
(D) Disabling security

Correct Answer: A

Explanation: Traffic filtering and load balancing — this correctly answers the question.

47. A company wants to protect against ransomware. Which measure is most appropriate?

(A) Ignoring the attack
(B) Regular backups
(C) Sharing passwords
(D) Disabling security

Correct Answer: B

Explanation: Regular backups ensure that data can be recovered if a ransomware attack occurs.

48. A company wants to protect against spyware. Which measure is most appropriate?

(A) Ignoring the attack
(B) Sharing passwords
(C) Anti-spyware tools and cautious downloading
(D) Disabling security

Correct Answer: C

Explanation: Anti-spyware tools and cautious downloading help prevent spyware from infecting systems.

49. A company wants to protect against phishing. Which measure is most appropriate?

(A) Ignoring the attack
(B) Sharing passwords
(C) Disabling security
(D) Awareness training and email filtering

Correct Answer: D

Explanation: Awareness training and email filtering — this correctly answers the question.

50. A company wants to protect against viruses. Which measure is most appropriate?

(A) Antivirus software and safe browsing
(B) Ignoring the attack
(C) Sharing passwords
(D) Disabling security

Correct Answer: A

Explanation: Antivirus software and safe browsing help prevent viruses from infecting systems.

Public Library · FBISE / NBF

Computer Science Grade 12 — Chapter 7

Digital Literacy

by Public Library

Independent practice MCQs from the supplied Class 12 Computer Science notes pack. Total: 50 questions.

A. Important / Main Topics

1. Research is best defined as:

(A) The process of investigating a specific question by gathering, analyzing, and interpreting information
(B) A type of database
(C) A programming language
(D) A type of network

Correct Answer: A

Explanation: Research is the process of investigating a specific question or topic by systematically gathering, analyzing, and interpreting information.

2. A research question serves as:

(A) A type of database
(B) A clear, focused, and specific guide for the investigation
(C) A programming language
(D) A type of network

Correct Answer: B

Explanation: A research question serves as a clear, focused, and specific guide for the entire investigation.

3. Which of the following is an advanced search technique?

(A) Boolean operators
(B) Quotation marks
(C) All of the above
(D) Site operator

Correct Answer: C

Explanation: Boolean operators, quotation marks, and site operators are all advanced search techniques.

4. What does the AND operator do?

(A) Finds results containing either term
(B) Excludes results containing a term
(C) None of the above
(D) Finds results containing both terms

Correct Answer: D

Explanation: Finds results containing both terms — this correctly answers the question.

5. What does the OR operator do?

(A) Finds results containing either term
(B) Finds results containing both terms
(C) Excludes results containing a term
(D) None of the above

Correct Answer: A

Explanation: Finds results containing either term — this correctly answers the question.

6. What does the NOT operator do?

(A) Finds results containing both terms
(B) Excludes results containing a term
(C) Finds results containing either term
(D) None of the above

Correct Answer: B

Explanation: Excludes results containing a term — this correctly answers the question.

7. How do quotation marks help in searching?

(A) They exclude terms
(B) They combine terms
(C) They search for exact phrases
(D) They filter by date

Correct Answer: C

Explanation: Quotation marks are used to search for exact phrases.

8. What does the site operator do?

(A) Searches for specific file types
(B) Searches for keywords in the title
(C) Excludes specific words
(D) Limits the search to a specific website or domain

Correct Answer: D

Explanation: Limits the search to a specific website or domain — this correctly answers the question.

9. What does the file type operator do?

(A) Searches for specific file types
(B) Limits the search to a specific website
(C) Searches for keywords in the title
(D) Excludes specific words

Correct Answer: A

Explanation: The file type operator (`filetype:`) searches for specific file types.

10. What does the intitle operator do?

(A) Limits the search to a specific website
(B) Returns web pages that contain the keywords in the title
(C) Searches for specific file types
(D) Excludes specific words

Correct Answer: B

Explanation: The intitle operator (`Intitle:`) returns web pages that contain the keywords/search string in the title of the document/page.

11. What are credible sources?

(A) Random websites
(B) Social media posts
(C) Peer-reviewed articles, trusted domains, up-to-date information
(D) Unverified sources

Correct Answer: C

Explanation: Credible sources include peer-reviewed articles, websites with trusted domains, and up-to-date information.

12. What are citation management tools?

(A) Tools that delete data
(B) Tools that store data
(C) Tools that ignore sources
(D) Tools like Zotero or Mendeley that help organize sources

Correct Answer: D

Explanation: Tools like Zotero or Mendeley that help organize sources — this correctly answers the question.

13. What is an artefact?

(A) A digital product that communicates research findings
(B) A type of database

(C) A programming language
(D) A type of network

Correct Answer: A

Explanation: An artefact is a digital product that communicates research findings and conclusions.

14. What is the first step in creating an artefact?

(A) Designing the artefact
(B) Data collection
(C) Presenting the artefact
(D) Evaluating the artefact

Correct Answer: B

Explanation: The first step is data collection by performing advanced searches to locate credible sources.

15. What forms can an artefact take?

(A) Only written reports
(B) Only presentations
(C) Written report, presentation, infographic, video, website
(D) Only videos

Correct Answer: C

Explanation: An artefact can take many forms, including written reports, presentations, infographics, videos, and websites.

16. Which of the following is a text-heavy report tool?

(A) PowerPoint
(B) Excel
(C) Tableau
(D) Microsoft Word

Correct Answer: D

Explanation: Microsoft Word is a text-heavy report tool.

17. Which of the following is a visual presentation tool?

(A) PowerPoint
(B) Google Docs
(C) Excel
(D) Tableau

Correct Answer: A

Explanation: PowerPoint is a visual presentation tool.

18. Which of the following is a data visualization tool?

(A) Microsoft Word
(B) Excel
(C) PowerPoint
(D) Google Docs

Correct Answer: B

Explanation: Excel — this correctly answers the question.

19. When should you use text-heavy reports?

(A) When presenting to an audience
(B) When showing trends and patterns
(C) When detailed explanations and citations are needed
(D) When engaging the audience

Correct Answer: C

Explanation: Text-heavy reports are used when detailed explanations and citations are needed.

20. When should you use visual presentations?

(A) When detailed explanations are needed

(B) When showing trends and patterns
(C) When formal citations are needed
(D) When presenting to an audience and engaging them

Correct Answer: D

Explanation: Visual presentations are used when presenting to an audience and engaging them.

21. When should you use data visualization tools?

(A) When showing trends and patterns in numerical data
(B) When detailed explanations are needed
(C) When presenting to an audience
(D) When formal citations are needed

Correct Answer: A

Explanation: Data visualization tools are used when showing trends and patterns in numerical data.

22. What does Fig. 7.5 show?

(A) A database
(B) Communication of collected data
(C) A programming language
(D) A network

Correct Answer: B

Explanation: Communication of collected data — this correctly answers the question.

23. Why is choosing the right tool important?

(A) It deletes data
(B) It stores data
(C) It helps present findings in a clear and effective way
(D) It ignores data

Correct Answer: C

Explanation: Choosing the right tool is important because it helps present findings in a clear and effective way.

24. Which tool is best for creating charts and graphs?

(A) Microsoft Word
(B) PowerPoint
(C) Google Docs
(D) Excel

Correct Answer: D

Explanation: Excel is best for creating charts and graphs.

25. Which tool is best for writing a detailed research paper?

(A) Microsoft Word
(B) PowerPoint
(C) Excel
(D) Tableau

Correct Answer: A

Explanation: Microsoft Word is best for writing a detailed research paper.

B. Less Important / Secondary Topics

26. Which tool is best for creating a visually engaging slideshow?

(A) PowerPoint
(B) Microsoft Word
(C) Excel
(D) Tableau

Correct Answer: A

Explanation: PowerPoint is best for creating a visually engaging slideshow.

27. What is the layout of a digital artefact?

(A) A type of database
(B) The structured arrangement of content
(C) A programming language
(D) A type of network

Correct Answer: B

Explanation: The layout of a digital artefact refers to the structured arrangement of content to effectively communicate research results and conclusions.

28. What are the three main parts of a digital artefact?

(A) Introduction, Methodology, Results
(B) Abstract, Body, References
(C) Introduction, Findings, Result/Conclusion
(D) Title, Body, Appendix

Correct Answer: C

Explanation: Introduction, Findings, Result/Conclusion — this correctly answers the question.

29. What should the introduction include?

(A) Only the research question
(B) Only the conclusion
(C) Only the findings
(D) Research question, objectives, background, purpose

Correct Answer: D

Explanation: Research question, objectives, background, purpose — this correctly answers the question.

30. What should the findings section include?

(A) Clear communication, visuals, labeling
(B) Only text
(C) Only visuals
(D) Only conclusions

Correct Answer: A

Explanation: Clear communication, visuals, labeling — this correctly answers the question.

31. What should the conclusion include?

(A) Only a summary
(B) Interpretation, implications, future research
(C) Only the introduction
(D) Only the findings

Correct Answer: B

Explanation: The conclusion should include a clear interpretation of the results, implications, and suggestions for future research.

32. Why is the introduction important?

(A) It deletes data
(B) It stores data
(C) It sets the stage for the rest of the artefact
(D) It ignores data

Correct Answer: C

Explanation: It sets the stage for the rest of the artefact — this correctly answers the question.

33. Why are visuals important in the findings section?

(A) They delete data
(B) They store data
(C) They ignore data
(D) They help break down complex data

Correct Answer: D

Explanation: Visuals are important because they help break down complex data into more digestible formats.

34. Why is the conclusion important?

(A) It ties everything together and tells the audience what the findings mean
(B) It deletes data
(C) It stores data
(D) It ignores data

Correct Answer: A

Explanation: The conclusion is important because it ties everything together and tells the audience what the findings mean.

35. What is the overall structure of a digital artefact?

(A) Only Introduction
(B) Introduction, Methodology, Results, Conclusion
(C) Only Conclusion
(D) Only Findings

Correct Answer: B

Explanation: Introduction, Methodology, Results, Conclusion — this correctly answers the question.

36. A student wants to search for articles on machine learning but exclude "deep learning." Which search query is most appropriate?

(A) `machine learning + deep learning`
(B) `"machine learning" AND "deep learning"`
(C) `machine learning - deep learning`
(D) `site: machine learning`

Correct Answer: C

Explanation: The hyphen excludes the term "deep learning" from the search results.

37. A student wants to search for PDFs about Python programming. Which search query is most appropriate?

(A) `site: pdf python programming`
(B) `intitle: pdf python programming`
(C) `"python programming"`
(D) `filetype: pdf python programming`

Correct Answer: D

Explanation: The `filetype:` operator searches for specific file types, such as PDFs.

38. A student wants to search for results from the Federal Board of Intermediate and Secondary Education website only. Which search query is most appropriate?

(A) `site: fbise.edu.pk`
(B) `filetype: fbise.edu.pk`
(C) `intitle: fbise.edu.pk`
(D) `"fbise.edu.pk"`

Correct Answer: A

Explanation: `site: fbise.edu.pk` — this correctly answers the question.

39. A student wants to search for web pages with "HSSC Result 2025" in the title. Which search query is most appropriate?

(A) `site: HSSC Result 2025`
(B) `intitle: HSSC Result 2025`
(C) `filetype: HSSC Result 2025`
(D) `"HSSC Result 2025"`

Correct Answer: B

Explanation: The `intitle:` operator returns web pages that contain the keywords in the title.

40. A student wants to find books priced between Rs. 500 and Rs. 1,500. Which search query is most appropriate?

(A) `books Rs500-Rs1500`
(B) `books Rs500 Rs1500`
(C) `books Rs500..Rs1500`
(D) `books Rs500 Rs1500`

Correct Answer: C

Explanation: The numbers range operator (`..`) is used to find results within a specific range.

41. A student wants to search for images that can be used for free. Which search option is most appropriate?

(A) "copyrighted"
(B) "all rights reserved"
(C) "paid only"
(D) "labeled for reuse"

Correct Answer: D

Explanation: The "labeled for reuse" filter returns images that can be used for free.

42. A student wants to create a research artefact about the impact of social media on mental health. What should be the first step?

(A) Data collection through advanced searches
(B) Designing the artefact
(C) Presenting the artefact
(D) Evaluating the artefact

Correct Answer: A

Explanation: The first step is data collection by performing advanced searches to locate credible sources.

43. A student has collected data and wants to present it to a non-technical audience. Which tool is most appropriate?

(A) LaTeX
(B) PowerPoint or Google Slides
(C) Tableau only
(D) Excel only

Correct Answer: B

Explanation: PowerPoint or Google Slides are ideal for presenting findings to a non-technical audience visually.

44. A student wants to create an infographic for a research project. Which tool is most appropriate?

(A) Microsoft Word
(B) Excel
(C) Canva or Piktochart
(D) LaTeX

Correct Answer: C

Explanation: Canva and Piktochart are multimedia tools used to create infographics.

45. A student wants to organize sources and generate citations for a research paper. Which tool is most appropriate?

(A) Microsoft Word
(B) PowerPoint
(C) Excel
(D) Zotero or Mendeley

Correct Answer: D

Explanation: Zotero and Mendeley are citation management tools used to organize sources and generate citations.

46. A student has created a research artefact and wants to improve it. What should be the next step?

(A) Reflection and self-assessment

(B) Deleting the artefact
(C) Ignoring the artefact
(D) Storing the artefact

Correct Answer: A

Explanation: After completing the artefact, reflection and self-assessment help identify areas for improvement.

47. A student wants to evaluate the credibility of a source. Which of the following is the best indicator of credibility?

(A) Social media posts
(B) Peer-reviewed articles from trusted domains
(C) Anonymous blog posts
(D) Unverified websites

Correct Answer: B

Explanation: Peer-reviewed articles from trusted domains are the most credible sources.

48. A student wants to create a research artefact with a logical structure. Which sequence is most appropriate?

(A) Findings → Introduction → Result/Conclusion
(B) Result/Conclusion → Findings → Introduction
(C) Introduction → Findings → Result/Conclusion
(D) Introduction → Result/Conclusion → Findings

Correct Answer: C

Explanation: The logical structure is Introduction (sets the stage), Findings (presents the data), and Result/Conclusion (interprets the results).

49. A student's research artefact includes poorly labeled visuals. What is the most likely consequence?

(A) The research will be more credible
(B) The artefact will be easier to understand
(C) The visuals will be more engaging
(D) The audience may be confused, and the credibility of the research may be undermined

Correct Answer: D

Explanation: Poorly labeled visuals can confuse the audience and undermine the credibility of the research.

50. A student wants to reflect on their research process. Which question is most appropriate?

(A) What was the most challenging part of the research?
(B) What is the capital of France?
(C) What is 2 + 2?
(D) What is the color of the sky?

Correct Answer: A

Explanation: "What was the most challenging part of the research?" is a reflection question that helps identify challenges and areas for improvement.

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Computer Science Grade 12 — Chapter 8

Entrepreneurship in Digital Age

by Public Library

Independent practice MCQs from the supplied Class 12 Computer Science notes pack. Total: 50 questions.

A. Important / Main Topics

1. An MVP is best defined as:

(A) The simplest version of a product that still solves a problem
(B) The final version of a product
(C) A type of database
(D) A programming language

Correct Answer: A

Explanation: An MVP (Minimum Viable Product) is the simplest version of a product that still solves a problem for customers.

2. What does the "M" in MVP stand for?

(A) Maximum
(B) Minimum
(C) Medium
(D) Moderate

Correct Answer: B

Explanation: Minimum — this correctly answers the question.

3. What does the "V" in MVP stand for?

(A) Variable
(B) Virtual
(C) Viable
(D) Visible

Correct Answer: C

Explanation: Viable — this correctly answers the question.

4. What does the "P" in MVP stand for?

(A) Process
(B) Program
(C) Platform
(D) Product

Correct Answer: D

Explanation: Product — this correctly answers the question.

5. Why is the MVP approach important?

(A) It allows entrepreneurs to test ideas without heavy investment
(B) It deletes data
(C) It stores data
(D) It ignores users

Correct Answer: A

Explanation: It allows entrepreneurs to test ideas without heavy investment — this correctly answers the question.

6. Which company used a video demo as an MVP?

(A) Airbnb
(B) Dropbox
(C) Slack
(D) Tesla

Correct Answer: B

Explanation: Dropbox used a short video demo as an MVP.

7. Which company used a soft launch in San Francisco?

(A) Dropbox
(B) Slack
(C) Airbnb
(D) Tesla

Correct Answer: C

Explanation: Airbnb — this correctly answers the question.

8. Which company used content marketing to target tech-savvy companies?

(A) Dropbox
(B) Airbnb
(C) Tesla
(D) Slack

Correct Answer: D

Explanation: Slack — this correctly answers the question.

9. Which company has a built-in feedback system in their cars?

(A) Tesla
(B) Dropbox
(C) Airbnb
(D) Slack

Correct Answer: A

Explanation: Tesla — this correctly answers the question.

10. Which company uses advanced analytics to track user behavior?

(A) Dropbox
(B) Spotify
(C) Airbnb
(D) Slack

Correct Answer: B

Explanation: Spotify uses advanced analytics to track user behavior.

11. What is a soft launch?

(A) A full launch to everyone
(B) A type of database
(C) A limited launch to gather feedback
(D) A programming language

Correct Answer: C

Explanation: A soft launch is a limited launch of a product to a smaller user base to gather feedback.

12. What is beta testing?

(A) A full launch to everyone
(B) A type of database
(C) A programming language
(D) Inviting a select group of users to test a product before public launch

Correct Answer: D

Explanation: Inviting a select group of users to test a product before public launch — this correctly answers the question.

13. What are feedback channels?

(A) Clear ways for users to provide feedback within the product
(B) Types of databases
(C) Programming languages

(D) Types of networks

Correct Answer: A

Explanation: Feedback channels are clear ways for users to provide feedback within the product.

14. What is monitoring and analytics?

(A) Deleting data
(B) Tracking user behavior and key metrics
(C) Storing data
(D) Ignoring users

Correct Answer: B

Explanation: Tracking user behavior and key metrics — this correctly answers the question.

15. What are the key takeaways from the MVP approach?

(A) Delete data, store data, ignore users, ignore feedback
(B) Build the full product, ignore feedback, target everyone, skip testing
(C) Use online tools, start with an MVP, use feedback, focus on solving a real problem
(D) Use offline tools, skip the MVP, ignore feedback, focus on features

Correct Answer: C

Explanation: The key takeaways are: use online tools to test your business idea; start with an MVP; use customer feedback to improve your idea; focus on solving a real problem for your users.

16. Why is targeted audience important?

(A) It deletes data
(B) It stores data
(C) It ignores users
(D) It helps ensure that the product resonates with the right users

Correct Answer: D

Explanation: A targeted audience helps ensure that the product resonates deeply with the users who are most likely to benefit from it.

17. Why is a soft launch useful?

(A) It helps iron out bugs and optimize the user experience before scaling up
(B) It deletes data
(C) It stores data
(D) It ignores users

Correct Answer: A

Explanation: It helps iron out bugs and optimize the user experience before scaling up — this correctly answers the question.

18. Why is beta testing useful?

(A) It deletes data
(B) It provides valuable feedback from real users before the public launch
(C) It stores data
(D) It ignores users

Correct Answer: B

Explanation: Beta testing provides valuable feedback from real users before the public launch.

19. Why is marketing important for launching an MVP?

(A) It deletes data
(B) It stores data
(C) It creates awareness and drives user acquisition
(D) It ignores users

Correct Answer: C

Explanation: It creates awareness and drives user acquisition — this correctly answers the question.

20. Why are feedback channels important?

(A) They delete data
(B) They store data
(C) They ignore users
(D) They ensure that users can easily share their thoughts, which helps improve the product

Correct Answer: D

Explanation: Feedback channels ensure that users can easily share their thoughts, which helps improve the product.

21. Why is monitoring and analytics important?

(A) It provides data-driven insights that help improve the product and measure success
(B) It deletes data
(C) It stores data
(D) It ignores users

Correct Answer: A

Explanation: Analytics provide data-driven insights that help improve the product and measure success.

22. Which of the following is a benefit of the MVP approach?

(A) It deletes data
(B) It reduces risk by validating demand before scaling
(C) It stores data
(D) It ignores users

Correct Answer: B

Explanation: It reduces risk by validating demand before scaling — this correctly answers the question.

23. What is the Dropbox example?

(A) The founders built the full product before testing
(B) The founders ignored user feedback
(C) The founders made a short video demo to test demand before building the full product
(D) The founders skipped the MVP

Correct Answer: C

Explanation: The founders made a short video demo to test demand before building the full product — this correctly answers the question.

24. What is the Airbnb example?

(A) A full launch worldwide
(B) Ignoring user feedback
(C) Skipping the MVP
(D) A soft launch in San Francisco to refine the product before scaling

Correct Answer: D

Explanation: A soft launch in San Francisco to refine the product before scaling — this correctly answers the question.

25. What is the Slack example?

(A) Content marketing to target a niche audience
(B) Ignoring marketing
(C) Skipping the MVP
(D) Deleting data

Correct Answer: A

Explanation: Content marketing to target a niche audience — this correctly answers the question.

B. Less Important / Secondary Topics

26. What is the Tesla example?

(A) A built-in feedback system to gather user input
(B) Ignoring user feedback
(C) Skipping the MVP

(D) Deleting data

Correct Answer: A

Explanation: Tesla uses a built-in feedback system in their cars to gather user input.

27. What is the Spotify example?

(A) Ignoring user behavior
(B) Advanced analytics to track user behavior
(C) Skipping the MVP
(D) Deleting data

Correct Answer: B

Explanation: Spotify uses advanced analytics to track user behavior.

28. What is the Lean Start-Up approach?

(A) An approach that ignores customer feedback
(B) An approach that builds the full product first
(C) An approach that focuses on building an MVP and improving based on feedback
(D) An approach that skips testing

Correct Answer: C

Explanation: An approach that focuses on building an MVP and improving based on feedback — this correctly answers the question.

29. What is the main goal of the MVP approach?

(A) To delete data
(B) To store data
(C) To ignore users
(D) To learn what works and what doesn't, then improve based on that learning

Correct Answer: D

Explanation: The MVP is not the final product — it is the starting point for learning and improvement.

30. What is the role of feedback in the MVP approach?

(A) It provides the information needed to learn and improve
(B) It deletes data
(C) It stores data
(D) It ignores users

Correct Answer: A

Explanation: Feedback is essential for learning and improving the product.

31. What is iterative development?

(A) A one-time product development process
(B) Continuous improvement through repeated cycles
(C) A type of database
(D) A programming language

Correct Answer: B

Explanation: Iterative development is the process of continuously improving a product through repeated cycles.

32. What are the three stages of the Build-Measure-Learn loop?

(A) Plan, Do, Check
(B) Design, Develop, Deploy
(C) Build, Measure, Learn
(D) Test, Debug, Deploy

Correct Answer: C

Explanation: The three stages are Build, Measure, and Learn.

33. What is a pivot?

(A) A type of database
(B) A programming language

(C) A type of network
(D) A structured course correction based on learning

Correct Answer: D

Explanation: A pivot is a structured course correction where an entrepreneur changes direction based on what has been learned.

34. What is product-market fit?

(A) The point where the product meets the needs of its target market
(B) A type of database
(C) A programming language
(D) A type of network

Correct Answer: A

Explanation: Product-market fit is the point where the product meets the needs of its target market.

35. Why is iterative development important?

(A) It deletes data
(B) It reduces risk, improves the product, saves time and money, and enables adaptation
(C) It stores data
(D) It ignores users

Correct Answer: B

Explanation: It reduces risk, improves the product, saves time and money, and enables adaptation — this correctly answers the question.

36. A startup has built an MVP and launched it to a small group of users. What should be the next step?

(A) Delete the product
(B) Ignore feedback
(C) Gather feedback and iterate
(D) Skip to full launch

Correct Answer: C

Explanation: After launching an MVP, the next step is to gather feedback and iterate on the product.

37. A startup wants to test its idea without building the full product. Which approach is most appropriate?

(A) Build the full product
(B) Skip testing
(C) Ignore users
(D) Build an MVP

Correct Answer: D

Explanation: Build an MVP — this correctly answers the question.

38. A startup launches its product only in one city to gather feedback before expanding. Which strategy is this?

(A) Soft launch
(B) Full launch
(C) Beta testing
(D) Ignoring users

Correct Answer: A

Explanation: A soft launch is a limited launch to gather feedback before a broader release.

39. A startup invites a small group of users to test its product before public launch. Which strategy is this?

(A) Soft launch
(B) Beta testing
(C) Full launch
(D) Ignoring users

Correct Answer: B

Explanation: Beta testing — this correctly answers the question.

40. A startup uses content marketing to reach a niche audience. Which strategy is this?

(A) Soft launch
(B) Beta testing
(C) Marketing and promotion
(D) Ignoring users

Correct Answer: C

Explanation: Marketing and promotion — this correctly answers the question.

41. A startup sets up an in-app feedback form to gather user input. Which strategy is this?

(A) Soft launch
(B) Beta testing
(C) Ignoring users
(D) Feedback channels

Correct Answer: D

Explanation: Feedback channels are clear ways for users to provide feedback within the product.

42. A startup uses analytics tools to track user behavior. Which strategy is this?

(A) Monitoring and analytics
(B) Soft launch
(C) Beta testing
(D) Ignoring users

Correct Answer: A

Explanation: Monitoring and analytics — this correctly answers the question.

43. A startup realizes that its product is not meeting user needs and decides to change direction. What is this called?

(A) Persevere
(B) Pivot
(C) Ignore
(D) Delete

Correct Answer: B

Explanation: A pivot is a structured course correction where an entrepreneur changes direction based on what has been learned.

44. A startup decides to continue with its current approach after analyzing feedback. What is this called?

(A) Pivot
(B) Ignore
(C) Persevere
(D) Delete

Correct Answer: C

Explanation: Persevere means continuing with the current approach after analyzing feedback.

45. A startup has achieved product-market fit. What does this mean?

(A) The product is failing
(B) The product has no users
(C) The product is not launched
(D) The product meets the needs of its target market

Correct Answer: D

Explanation: Product-market fit is the point where the product meets the needs of its target market.

46. A startup wants to reduce the risk of failure. Which approach is most appropriate?

(A) Build an MVP and iterate based on feedback

(B) Build the full product without testing
(C) Ignore user feedback
(D) Skip the MVP

Correct Answer: A

Explanation: Build an MVP and iterate based on feedback — this correctly answers the question.

47. A startup wants to test its idea quickly and cheaply. Which approach is most appropriate?

(A) Build the full product
(B) Build a video demo as an MVP
(C) Ignore user feedback
(D) Skip testing

Correct Answer: B

Explanation: A video demo (like Dropbox's) is a quick and cheap way to test demand before building the full product.

48. A startup wants to gather feedback from real users before public launch. Which strategy is most appropriate?

(A) Full launch
(B) Ignoring users
(C) Beta testing
(D) Skipping testing

Correct Answer: C

Explanation: Beta testing gathers feedback from real users before public launch.

49. A startup wants to measure the success of its MVP. Which strategy is most appropriate?

(A) Ignoring users
(B) Skipping testing
(C) Deleting data
(D) Monitoring and analytics

Correct Answer: D

Explanation: Monitoring and analytics — this correctly answers the question.

50. A startup wants to improve its product based on user feedback. Which approach is most appropriate?

(A) Iterative development
(B) Ignoring feedback
(C) Skipping testing
(D) Deleting data

Correct Answer: A

Explanation: Iterative development — this correctly answers the question.