

AP Computer Science Principles Exam - Multiple Choice Questions

1. Which of the following best describes the purpose of an algorithm in computer science?
 - A. To store data efficiently
 - B. To perform a specific task or solve a problem
 - C. To display information to the user
 - D. To manage hardware resources
 - E. To encrypt sensitive information
2. In programming, what is the primary function of a loop?
 - A. To execute a set of instructions repeatedly
 - B. To make decisions based on conditions
 - C. To define variables
 - D. To handle exceptions
 - E. To import libraries
3. Which data structure is most appropriate for storing a collection of unique items?
 - A. Array
 - B. Stack
 - C. Queue
 - D. Set
 - E. List
4. What is the primary purpose of the Domain Name System (DNS) in networking?
 - A. To assign IP addresses to devices
 - B. To translate domain names into IP addresses
 - C. To encrypt data transmitted over the internet
 - D. To manage network traffic
 - E. To establish peer-to-peer connections

5. Which of the following is an example of a high-level programming language?
- A. Assembly
 - B. Machine code
 - C. Python
 - D. Binary
 - E. Hexadecimal
6. What does the term 'abstraction' refer to in computer science?
- A. The process of hiding complex implementation details
 - B. The conversion of high-level code to machine code
 - C. The physical layout of hardware components
 - D. The storage of data in databases
 - E. The encryption of sensitive information
7. In the context of cybersecurity, what is phishing?
- A. A method of encrypting data
 - B. An attack that involves tricking individuals into revealing personal information
 - C. A technique for testing software security
 - D. A process of scanning networks for vulnerabilities
 - E. A type of firewall configuration
8. Which of the following best describes 'big data'?
- A. Data that is stored in large databases
 - B. Extremely large datasets that require specialized tools to analyze
 - C. Data that is highly structured and easy to process
 - D. Small datasets used for testing purposes
 - E. Data that is stored on personal computers
9. What is the main advantage of using a cloud computing service?
- A. Enhanced physical security of data

- B. Scalability and on-demand resource availability
- C. Reduced need for internet connectivity
- D. Complete control over hardware infrastructure
- E. Elimination of all data privacy concerns

10. Which sorting algorithm has the best average-case time complexity?

- A. Bubble Sort
- B. Selection Sort
- C. Insertion Sort
- D. Merge Sort
- E. Quick Sort

11. Which of the following best describes an API (Application Programming Interface)?

- A. A tool used to design user interfaces
- B. A protocol that allows different software applications to communicate
- C. A database management system
- D. A web browser extension
- E. A physical hardware component

12. What is the purpose of a Boolean expression in programming?

- A. To perform arithmetic calculations
- B. To store text values
- C. To evaluate conditions as either true or false
- D. To loop through a sequence of numbers
- E. To define a function

13. Which of the following best describes an advantage of using parallel computing?

- A. It reduces power consumption

- B. It increases processing speed by dividing tasks among multiple processors
- C. It simplifies programming logic
- D. It eliminates the need for algorithms
- E. It prevents errors in data processing

14. Which of the following is NOT a characteristic of an efficient algorithm?

- A. It runs in a reasonable amount of time
- B. It uses excessive memory
- C. It solves the intended problem
- D. It follows a clear set of logical steps
- E. It produces a correct result

15. What is the primary function of an operating system?

- A. To write and compile code
- B. To manage hardware and software resources on a computer
- C. To provide security encryption for the internet
- D. To execute only one program at a time
- E. To store user passwords

16. Which of the following is an example of a lossless data compression technique?

- A. JPEG
- B. MP3
- C. ZIP
- D. GIF
- E. MP4

17. What does a linear search algorithm do?

- A. It searches for an item by checking every element in the list sequentially
- B. It divides the list into halves to find an item

- C. It sorts the list before searching
- D. It only works on sorted lists
- E. It uses multiple processors to find an item

18. Which cybersecurity measure is best for protecting sensitive data from unauthorized access?

- A. Using a strong password and two-factor authentication
- B. Only using public Wi-Fi networks
- C. Disabling all firewall protections
- D. Storing passwords in an unencrypted document
- E. Clicking on email links without verification

19. What does the term 'open source' software mean?

- A. Software that is free to use but cannot be modified
- B. Software whose source code is publicly available and can be modified
- C. Software that requires a subscription for access
- D. Software that is developed only by large corporations
- E. Software that runs on only one type of operating system

20. What is the purpose of a function in programming?

- A. To permanently store data
- B. To execute code sequentially without repetition
- C. To encapsulate a block of code that can be reused
- D. To create graphics and animations
- E. To compile a program into machine code

21. What is an advantage of using a binary search algorithm over a linear search?

- A. Binary search is easier to implement
- B. Binary search works on both sorted and unsorted lists
- C. Binary search is faster on large sorted datasets
- D. Binary search requires less memory than linear search

- E. Binary search always finds the correct answer
22. Which of the following best describes the function of a firewall in cybersecurity?
- A. It encrypts all data before transmission
 - B. It prevents unauthorized access to a network
 - C. It removes viruses from a computer
 - D. It backs up data automatically
 - E. It speeds up internet connections
23. What is a primary characteristic of an iterative process in software development?
- A. It involves writing all code before testing
 - B. It follows a strict linear sequence
 - C. It uses repeated cycles of designing, testing, and refining
 - D. It does not require user feedback
 - E. It is only used in small projects
24. Which of the following best describes the difference between IPv4 and IPv6?
- A. IPv6 provides more available IP addresses than IPv4
 - B. IPv4 is more secure than IPv6
 - C. IPv4 is only used for wireless networks
 - D. IPv6 is only used for large-scale enterprise systems
 - E. IPv6 reduces the speed of internet communication
25. Which of the following is an example of a heuristic approach to problem-solving?
- A. An algorithm that guarantees the best possible solution
 - B. A method that prioritizes efficiency over exact solutions
 - C. A brute force approach that checks all possibilities
 - D. A sorting algorithm that always produces an optimal result
 - E. A technique that avoids approximation in calculations

26. What is a key characteristic of a distributed computing system?

- A. It uses a single processor to complete tasks
- B. It relies on a centralized database for all computations
- C. It spreads processing tasks across multiple devices or computers
- D. It does not require internet connectivity
- E. It is only used for gaming applications

27. Which of the following is true about symmetric encryption?

- A. It requires a public and private key for encryption
- B. It uses the same key for encryption and decryption
- C. It is slower than asymmetric encryption
- D. It cannot be used for securing internet transactions
- E. It is primarily used in blockchain technology

28. Which type of error occurs when a program runs but produces an incorrect result?

- A. Syntax error
- B. Runtime error
- C. Logic error
- D. Compilation error
- E. Overflow error

29. Which of the following best describes the role of metadata in digital files?

- A. It encrypts the file for security purposes
- B. It provides additional information about the file, such as its size and author
- C. It compresses the file to reduce storage space
- D. It deletes unnecessary data from the file
- E. It prevents unauthorized users from opening the file

30. What is an example of a DDoS (Distributed Denial-of-Service) attack?

- A. A hacker stealing personal information through email phishing
- B. An attacker overwhelming a website with traffic to make it unavailable
- C. A computer virus spreading through a USB drive
- D. A password being guessed using brute force
- E. A network administrator blocking an unauthorized IP address

31. Which of the following best describes an advantage of using a database over a spreadsheet?

- A. Databases are only used for small datasets
- B. Databases allow for efficient storage and retrieval of large amounts of data
- C. Spreadsheets are faster at handling big data than databases
- D. Databases cannot be accessed over the internet
- E. Spreadsheets allow for more advanced queries than databases

32. What is the primary role of a function in programming?

- A. To store data permanently
- B. To create a reusable block of code that performs a specific task
- C. To write data to a file
- D. To execute only once in a program
- E. To make a program run slower

33. Which of the following statements about open-source software is true?

- A. Open-source software is always free
- B. Open-source software cannot be modified by users
- C. Open-source software allows users to view and modify the source code
- D. Open-source software is only developed by large companies
- E. Open-source software is always less secure than proprietary software

34. Which type of loop would be most appropriate when the number of iterations is known in advance?

- A. While loop
- B. For loop
- C. Do-while loop
- D. Infinite loop
- E. Recursive loop

35. What does the digital divide refer to?

- A. The gap between different levels of internet access and technology usage among people
- B. The process of dividing digital data into smaller packets for transmission
- C. The difference between analog and digital signals
- D. The separation of network layers in computer systems
- E. The transition from physical books to e-books

36. Which of the following is an example of a phishing attack?

- A. A hacker guessing a user's password using brute force
- B. An attacker sending fraudulent emails pretending to be a trusted source to steal information
- C. A hacker exploiting a software vulnerability to gain access to a system
- D. A virus spreading through a file attachment
- E. An attack where a website is flooded with traffic to crash it

37. What is an abstraction in computer science?

- A. A process of hiding complex implementation details to simplify usage
- B. A method of slowing down the execution of a program
- C. A way to physically remove data from memory
- D. A security technique for encrypting passwords

- E. A file format used for compressing large files

38. Which of the following best describes how packets are used in data transmission?

- A. Packets are large blocks of data that must be transmitted in order
- B. Packets are small chunks of data that can be transmitted independently and reassembled later
- C. Packets always arrive in the correct order without errors
- D. Packets do not contain sender and receiver information
- E. Packets require manual routing by the user

39. Which of the following is an example of a one-to-one relationship in a database?

- A. One student can enroll in multiple courses
- B. One book can be borrowed by multiple users
- C. One employee is assigned to exactly one office
- D. Multiple users can share a single email account
- E. A website with multiple registered users

40. What is the main goal of a hashing algorithm?

- A. To sort data in ascending order
- B. To convert input data into a fixed-size value for security or indexing
- C. To search for data in a large dataset
- D. To encrypt messages for secure communication
- E. To compress data for storage

41. Which of the following is an example of a cyberattack that exploits human psychology?

- A. Phishing
- B. Denial-of-Service (DoS) attack
- C. SQL Injection
- D. Man-in-the-Middle attack

- E. Brute force attack

42. What is the primary purpose of an IP address?

- A. To encrypt internet traffic
- B. To uniquely identify devices on a network
- C. To store website data
- D. To improve computer performance
- E. To speed up internet connections

43. Which of the following is a key feature of cloud computing?

- A. Data is stored only on local devices
- B. Users must install all software on their personal computers
- C. Computing resources are provided on demand over the internet
- D. Cloud computing is only available for large businesses
- E. Cloud services are always free

44. Which sorting algorithm generally has the best time complexity for large datasets?

- A. Bubble Sort
- B. Selection Sort
- C. Merge Sort
- D. Insertion Sort
- E. Linear Sort

45. Which of the following is an ethical concern related to artificial intelligence (AI)?

- A. AI always produces unbiased results
- B. AI reduces the need for data privacy
- C. AI can inherit biases from the data it is trained on
- D. AI eliminates all security risks
- E. AI is always transparent in decision-making

46. Which statement best describes how the internet is structured?

- A. The internet is controlled by a single organization
- B. The internet is a decentralized network of interconnected devices
- C. The internet only works when all computers are turned on
- D. The internet requires all data to travel through a central server
- E. The internet only allows secure data to be transmitted

47. Which of the following is NOT an advantage of using an algorithm to solve a problem?

- A. It provides a step-by-step solution
- B. It guarantees efficiency in all cases
- C. It can be reused for similar problems
- D. It helps automate repetitive tasks
- E. It can be implemented in different programming languages

48. Which data type would be most appropriate for storing a user's age in a program?

- A. Boolean
- B. String
- C. Integer
- D. Float
- E. List