

Question 1: A teacher gives pseudocode to students:

START

SET $x = 4$

WHILE $x < 40$

PRINT x

$x = x * 2$

ENDWHILE

END

What sequence will be printed?

- a) 4, 8, 16, 32, 64
- b) 4, 8, 16, 32
- c) 4, 6, 8, 10
- d) 2, 4, 8, 16, 32

Question 2: A small website form collects passwords in plain text to a server. Which two actions most urgently reduce risk?

- a) Display password strength meter and force long passwords
- b) Hash passwords on the server using a strong salt and enable HTTPS for form submission
- c) Log passwords to a file for backup and email them to admins
- d) Allow login without password to avoid storage

Question 3: Which HTML element is best for grouping related form controls like name and address?

- a) `<div>` only
- b) `<form>` (entire form)
- c) `<fieldset>`
- d) `<article>`

Question 4: In algorithm analysis, which of the following describes linear time complexity?

- a) Running time grows proportionally with input size ($O(n)$)
- b) Running time stays constant regardless of input ($O(1)$)
- c) Running time grows as square of input ($O(n^2)$)
- d) Running time grows exponentially ($O(2^n)$)

Question 5: Which JavaScript expression will correctly test whether the variable age is 18 or older?

- a) `if (age => 18)`
- b) `if (age >= 18)`
- c) `if (age = 18)`
- d) `if (age >>> 18)`

Question 6: In SQL, which clause filters groups after aggregation (e.g., to show departments with average salary > 50,000)?

- a) WHERE
- b) HAVING
- c) GROUP BY
- d) ORDER BY

Question 7: Which is a valid reason to choose a NoSQL database instead of a relational SQL database?

- a) Need for strict ACID transactions across multiple tables always
- b) Flexible schema and horizontal scaling for large semi-structured data
- c) Want simple joins across many normalized tables
- d) Need only single-user desktop app

Question 8: A student writes this pseudocode to find the largest of three numbers A, B, C:

IF A > B THEN

IF A > C THEN PRINT A

ELSE IF B > C THEN PRINT B

ELSE PRINT C

Why might this code produce incorrect results?

- a) It uses > instead of >=, but that's harmless
- b) the ELSE pairs incorrectly
- c) It is syntactically perfect and will always work
- d) It misses printing when all equal because PRINT is missing

Question 9: Which cyber security concept refers to verifying the user is who they claim to be?

- a) Authorization
- b) Authentication
- c) Encryption
- d) Hashing

Question 10: In HTML, which attribute of improves accessibility by providing descriptive text?

- a) src
- b) alt
- c) title
- d) href

Question 11: Which statement best describes supervised machine learning?

- a) The model learns patterns using labelled input-output pairs to make predictions
- b) The model randomly guesses without data
- c) The model only clusters unlabelled data
- d) The model runs on a single instruction repeatedly

Question 12: Which flowchart symbol is used to represent input or output (e.g., "Enter n")?

- a) Rectangle
- b) Diamond
- c) Parallelogram
- d) Oval

Question 13: A classroom computer used by many students should have which configuration to reduce malware risk?

- a) All users run as local administrator to install needed tools quickly
- b) Use a standard limited user account, restrict software installs, and keep OS/antivirus updated
- c) Disable the firewall to speed up network access
- d) Store all passwords in a shared text file on the desktop

Question 14: What does SQL JOIN do?

- a) Stops a query mid-execution
- b) Combines rows from two or more tables based on a related column
- c) Deletes duplicate tables
- d) Converts SQL into JavaScript

Question 15: In JavaScript, which of these values is considered "falsy" (i.e., treated as false in conditionals)?

- a) "false" (string)
- b) 0 (number zero)
- c) [] (empty array)
- d) {} (empty object)

Question 16: Which algorithmic technique divides a problem into smaller identical problems?

- a) Greedy method
- b) Divide and conquer
- c) Backtracking
- d) Iterative deepening

Question 17: In a website's CSS, which rule will set the text colour of <p> elements to blue?

- a) `p { colour: blue; }`
- b) `p { text-colour: blue; }`
- c) `<p style="colour: blue;">`
- d) `p = colour(blue);`

Question 18: Which is the main ethical concern with deploying facial recognition in schools?

- a) Increased fun at events
- b) Privacy violations and potential biased identification leading to unfair treatment
- c) Faster computer performance
- d) Reduced electricity bills

Question 19: A student writes CSS:

```
.container { display: flex; }  
.item { flex: 1; }
```

What does flex: 1; do for .item elements inside .container?

- a) It makes each item occupy proportional available space
- b) It sets font-size to 1px
- c) It hides the items
- d) It applies 1px border only

Question 20: Which SQL command permanently removes a table and its structure from the database?

- a) `DELETE TABLE table_name;`
- b) `DROP TABLE table_name;`
- c) `TRUNCATE DATABASE table_name;`
- d) `REMOVE table_name;`

Question 21: A small program should compute factorial (n). For n = 0 it returns 1, but student's code returns 0. Which mistake is most likely?

- a) Using an iterative loop that multiplies starting at 0
- b) Using recursion which always returns 0 for zero
- c) Fonts are too small
- d) The program used + instead of * everywhere but still returns 1

Question 22: Which concept in cyber security ensures that data has not been altered in transit?

- a) Confidentiality
- b) Integrity
- c) Availability
- d) Scalability

Question 23: Which HTML element would you use to include JavaScript code inside a page?

- a) `<script>`
- b) `<js>`
- c) `<code>`
- d) `<program>`

Question 24: A decision tree model in machine learning is best described as:

- a) A sequence of arithmetic operations only
- b) A flowchart-like structure that splits data on feature values to make predictions
- c) A linear equation with no branching
- d) A neural network with hidden layers

Question 25: Which SQL clause is used to sort query results by a column?

- a) ORDER BY
- b) GROUP BY
- c) SORT ON
- d) ARRANGE

Question 26: Which is the most secure practice for password storage on a website?

- a) Store passwords as plain text
- b) Hash passwords using a strong, slow, salted hash
- c) Encrypt passwords using reversible symmetric key and store key in same server file
- d) Email passwords to users for backup

Question 27: Which data structure is best for implementing a queue (FIFO)?

- a) Stack
- b) Queue
- c) Hash table
- d) Binary search tree

Question 28: You must search for a name in an unsorted list of 1,000 student names. Which approach gives guaranteed result and what is its time complexity?

- a) Binary search — $O(\log n)$
- b) Linear search — $O(n)$
- c) Hashing is $O(1)$ always without prep
- d) Sorting first and then binary search is $O(1)$

Question 29: Which of the following is an example of two-factor authentication (2FA)?

- a) Password only
- b) Password + OTP sent to mobile phone
- c) Password typed twice
- d) Using the same password on two sites

Question 30: In pseudocode, what does FOR i FROM 1 TO N STEP 2 do?

- a) Loops $i = 1, 2, 3, \dots, N$ every time
- b) Loops $i = 1, 3, 5, \dots$ up to N (increments by 2)
- c) Does nothing unless N is even
- d) Multiplies i by 2 each iteration

Question 31: Which JavaScript statement changes the text content of an element with id "title"?

- a) `document.getElementById("title").innerText = "Hello";`
- b) `document.getElementById("title").value = "Hello";`
- c) `getElement("title").text = "Hello";`
- d) `#title = "Hello";`

Question 32: Which of the following best describes overfitting in machine learning?

- a) The model performs well on training data but poorly on new unseen data
- b) The model is too simple and under-performs on both train and test sets
- c) The model never learns anything
- d) The model always runs faster

Question 33: A webpage loads slowly because images are very large. Which two immediate actions will improve load speed?

- a) Convert images to appropriate compressed formats and use responsive sizes
- b) Add more animated gifs to distract users
- c) Increase font-size of the page
- d) Remove CSS entirely

Question 34: Which operator in many programming languages is used for equality comparison (value and type in JS)?

- a) =
- b) ==
- c) ===
- d) :=

Question 35: What is the purpose of the SELECT statement in SQL?

- a) To add new rows to a table
- b) To retrieve data from one or more tables
- c) To save the database to disk
- d) To create a new table

Question 36: Which technique reduces model complexity by randomly dropping nodes during training in neural networks?

- a) Regularization by L1 only
- b) Dropout
- c) Increasing learning rate only
- d) Multiplying weights by zero always

Question 37: Which of the following is a secure practice when opening email attachments?

- a) Opening attachments from unknown senders immediately
- b) Scan the attachment with antivirus and confirm sender before opening
- c) Disable antivirus to improve speed
- d) Save the attachment as .exe and run it

Question 38: In a CSS rule .box { padding: 10px; margin: 20px;}, which is true?

- a) Padding is the space outside the border, margin is inside the border
- b) Padding is inside the border, margin is outside the border
- c) Both do the same thing
- d) These are only JavaScript properties

Question 39: Which SQL query gives the number of students in the table Students?

- a) COUNT * FROM Students;
- b) SELECT COUNT(*) FROM Students;
- c) SELECT NUMBER(Students);
- d) SUM(Students);

Question 40: A student discovers a vulnerability that reveals classmates' grades via a website URL tweak. Ethically, what should they do first?

- a) Publicly post the exploit and encourage others to try it
- b) Report the vulnerability privately to the teacher/IT admin and do not exploit further
- c) Sell the exploit online for profit
- d) Change the grades to give friends higher marks

Question 41: Which HTML element is most appropriate for marking up a navigation menu?

- a) <nav>
- b) <header>
- c) <section>
- d) <footer>

Question 42: Which of these is not typically a supervised learning task?

- a) Classification
- b) Regression
- c) Clustering
- d) Predicting labels based on examples

Question 43: In algorithm design, greedy algorithms make choices that are:

- a) Optimal for the overall problem always
- b) Locally optimal at each step hoping to find a global optimum
- c) Random picks only
- d) Always backtracking

Question 44: Which CSS property controls the space between letters?

- a) letter-spacing
- b) word-spacing
- c) line-height
- d) text-indent

Question 45: Which SQL statement changes existing rows in a table?

- a) INSERT INTO
- b) UPDATE table_name SET column = value WHERE condition;
- c) CREATE TABLE
- d) DROP TABLE

Question 46: You have imbalanced dataset for classification (many more negatives than positives). Which approach helps train a fair classifier?

- a) Ignore imbalance and proceed
- b) Use resampling, use appropriate metrics, or use class-weighted loss
- c) Always predict the majority class to get high accuracy
- d) Remove all minority class examples

Question 47: Which HTML attribute makes a form input required in modern browsers?

- a) mandatory
- b) required
- c) must
- d) validate

Question 48: Which is a commonly used hash function family for password storage (note: use slow, salted functions in practice)?

- a) MD5 without salt
- b) SHA1 unsalted
- c) bcrypt (slow, saltable)
- d) Plain Base64 encoding

Question 49: Which JavaScript method schedules a function to run after a specified delay (milliseconds)?

- a) setTimeout(function, ms)
- b) delay(function, ms)
- c) wait(function, ms)
- d) sleep(ms)

Question 50: Which database constraint ensures a column cannot have duplicate values?

- a) NOT NULL
- b) PRIMARY KEY or UNIQUE constraint
- c) CHECK
- d) DEFAULT

Question 51: Consider pseudocode:

```
sum = 0
FOR i FROM 1 TO N
    sum = sum + i
END FOR
PRINT sum
```

What does the program compute?

- a) Product of numbers 1..N
- b) Sum of integers 1 through N (triangular number)
- c) Sum of even numbers only
- d) Count of prime numbers up to N

Question 52: Which practice improves website accessibility for people using screen readers?

- a) Use meaningful alt text for images and semantic HTML elements
- b) Use images only and no text
- c) Rely on flashing graphics instead of text
- d) Hide content with CSS only

Question 53: Which method is commonly used to prevent SQL injection attacks?

- a) Concatenate user input into SQL strings directly
- b) Use parameterized queries / prepared statements and validate inputs
- c) Disable the database server firewall
- d) Store SQL queries in plain text files

Question 54: Which machine learning evaluation metric is most useful when classes are imbalanced and you want to balance precision and recall?

- a) Accuracy only
- b) F1 score
- c) Raw loss value only
- d) Number of features

Question 55: Which HTML tag semantically represents the main heading of a page?

- a) <h1>
- b) <title>
- c) <head>
- d) <main>

Question 56: Which is the correct SQL to create an index to speed up queries on email column of Users table?

- a) CREATE INDEX idx_email ON Users(email);
- b) INDEX CREATE email Users;
- c) ADD INDEX email TO Users;
- d) SPEED UP Users.email;

Question 57: Which programming paradigm emphasizes functions without side effects and immutable data?

- a) Object-oriented programming
- b) Functional programming
- c) Procedural programming
- d) Imperative programming

Question 58: A button click should disable the button to prevent double submission and then send data. Which JS sequence is safest?

- a) Immediately disable the button, then send data via AJAX and re-enable if error
- b) Send data first then disable the button after several seconds
- c) Always disable for 60 seconds no matter what
- d) Do nothing; allow multiple clicks

Question 59: What is the main reason to use GROUP BY in SQL?

- a) To group rows that have the same values so aggregate functions (SUM, AVG, COUNT) can be applied per group
- b) To order results alphabetically
- c) To delete rows with duplicates
- d) To combine two tables

Question 60: Which statement explains the difference between AI and traditional rule-based programs?

- a) AI learns patterns from data to make decisions; rule-based programs follow explicit rules written by humans without learning
- b) AI uses only if-then rules; rule-based systems learn automatically
- c) No difference: they are exactly the same
- d) AI always requires a database while rule-based programs do not