

Question 1:

'Let x = 1. What is x << 3 in Python 3?', A. '1', B. '3', C. '8', D. '16'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: C

Answer Option 3:

Final Answer: C

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: C

Answer Option 6:

Final Answer: C

Answer Option 7:

Final Answer: C

Answer Option 8:

Final Answer: C

Answer Option 9:

Final Answer: C

Question 2:

'In Python 3, which of the following function convert a string to an int in python?', A. 'int(x [,base])', B. 'long(x [,base])', C. 'float(x)', D. 'str(x)'

=====

Answer Option 1:

Final Answer: A

Answer Option 2:

Final Answer: A

Answer Option 3:

Final Answer: A

Answer Option 4:

Final Answer: A

Answer Option 5:

Final Answer: A

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: A

Answer Option 9:

Final Answer: A

Question 3:

'A user enters a Web address in a browser, and a request for a file is sent to a Web server. Which of the following best describes how the file is sent to the user?', A. 'The file is broken into packets for transmission. The packets must be reassembled upon receipt.', B. 'The file is broken into packets for transmission. The user's browser must request each packet in order until all packets are received.', C. 'The server attempts to connect directly to the user's computer. If the connection is successful, the entire file is sent. If the connection is unsuccessful, an error message is sent to the user.', D. 'The server repeatedly attempts to connect directly to the user's computer until a connection is made. Once the connection is made, the entire file is sent.'

=====

Answer Option 1:

Final Answer: A

Answer Option 2:

Final Answer: A

Answer Option 3:

Final Answer: A

Answer Option 4:

Final Answer: A

Answer Option 5:

Final Answer: A

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: A

Answer Option 9:

Final Answer: A

Question 4:

'Digital images are often represented by the red, green, and blue values (an RGB triplet) of each individual pixel in the image. A photographer is manipulating a digital image and overwriting the original image.

Which of the following describes a lossless transformation of the digital image?', A. 'Compressing the image in a way that may lose information but will suffer only a small loss of image quality.', B. 'Creating the gray scale of an image by averaging the amounts of red, green, and blue in each pixel and assigning this new value to the corresponding pixel in the new image. The new value of each pixel represents a shade of gray, ranging from white to black.', C. 'Creating the negative of an image by creating a new RGB triplet for each pixel in which each value is calculated by subtracting the original value from 255. The negative of an image is reversed from the original; light areas appear dark, and colors are reversed.', D. 'Modifying part of the image by taking the pixels in one part of the picture and copying them to the pixels in another part of the picture.'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: C

Answer Option 3:

Final Answer: C

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: C

Answer Option 6:

Final Answer: C

Answer Option 7:

Final Answer: C

Answer Option 8:

Final Answer: C

Answer Option 9:

Final Answer: C

Question 5:

'A programmer is writing a program that is intended to be able to process large amounts of data. Which of the following considerations is LEAST likely to affect the ability of the program to process larger data sets?', A. 'How long the program takes to run', B. 'How many programming statements the program contains', C. 'How much memory the program requires as it runs', D. 'How much storage space the program requires as it runs'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 6:

'Suppose the characters 0,1, . . . ,8,9,A,B,C,D, E,F are used to represent a hexadecimal (base-16) number. Here A = 10, B = 11, . . . ,F = 15. What is the largest base-10 integer that can be represented with a two-digit hexadecimal number, such as 14 or 3A?', A. '32', B. '225', C. '255', D. '256'

=====

Answer Option 1:

Final Answer: C

=====

Answer Option 2:

Final Answer: C

=====

Answer Option 3:

Final Answer: C

=====

Answer Option 4:

Final Answer: C

=====

Answer Option 5:

Final Answer: C

=====

Answer Option 6:

Final Answer: C

=====

Answer Option 7:

Final Answer: C

=====

Answer Option 8:

Final Answer: C

=====

Answer Option 9:

Final Answer: C

=====

Question 7:

'A large data set contains information about all students majoring in computer science in colleges across the United States. The data set contains the following information about each student.

- ° The student's gender
- ° The state in which the student attends college
- ° The student's grade point average on a 4.0 scale

Which of the following questions could be answered by analyzing only information in the data set?', A. 'Do students majoring in computer science tend to have higher grade point averages than students majoring in other subjects?', B. 'How many states have a higher percentage of female computer science majors than male computer science majors attending college in that state?', C. 'What percent of students attending college in a certain state are majoring in computer science?', D. 'Which college has the highest number of students majoring in computer science?'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 8:

The code segment below uses the procedure IsFound (list, item), which returns true if item appears in list and returns false otherwise. The list resultList is initially empty.

```
FOR EACH item IN inputList1{  
  IF (isFound (inputList2, item) )  
    APPEND (resultList, item)  
}
```

Which of the following best describes the contents of resultList after the code segment is executed?, A. 'All elements in inputList1 followed by all elements in inputList2', B. 'Only elements that appear in both inputList1 and inputList2', C. 'Only elements that appear in either inputList1 or inputList2 but not in both lists', D. 'Only elements that appear in inputList1 but not in inputList2'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 9:

'A program is expressed in a programming language. Which of the following is true of the program?', A. 'The program can also be expressed as binary code, but will be more easily understood by humans when expressed in a higher-level programming language.', B. 'The program can also be expressed as binary code, which will reduce the likelihood of errors.', C. 'The program cannot be expressed as binary code, because binary code can only be used to represent data.', D. 'Some parts of the program can be expressed as binary code, but operations must be expressed using a higher-level programming language.'

=====

Answer Option 1:

Final Answer: A

Answer Option 2:

Final Answer: A

Answer Option 3:

Final Answer: A

Answer Option 4:

Final Answer: A

Answer Option 5:

Final Answer: A

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: A

Answer Option 9:

Final Answer: A

Question 10:

'In Python 3, what is the output of print tuple[0] if tuple = ('abcd', 786 , 2.23, 'john', 70.2)?', A. ('abcd', 786 , 2.23, 'john', 70.2), B. 'abcd', C. 'Error', D. 'None of the above.'

=====

Answer Option 1:

Final Answer: B

=====

Answer Option 2:

Final Answer: B

=====

Answer Option 3:

Final Answer: B

=====

Answer Option 4:

Final Answer: B

=====

Answer Option 5:

Final Answer: B

=====

Answer Option 6:

Final Answer: B

=====

Answer Option 7:

Final Answer: B

=====

Answer Option 8:

Final Answer: B

=====

Answer Option 9:

Final Answer: B

=====

Question 11:

'Of the following potential benefits, which is LEAST likely to be provided by the upgraded system?'. A. 'Human representatives will not be needed to respond to some inquiries.', B. 'The company will be able to provide a human representative for any incoming call.', C. 'Customers are likely to spend less time listening to information not relevant to their issue.', D. 'Customers will be unable to mistakenly select the incorrect department for their particular issue.'

=====

Answer Option 1:

Final Answer: B

=====

Answer Option 2:

Final Answer: B

=====

Answer Option 3:

Final Answer: B

=====

Answer Option 4:

Final Answer: B

=====

Answer Option 5:

Final Answer: B

=====

Answer Option 6:

Final Answer: B

=====

Answer Option 7:

Final Answer: B

=====

Answer Option 8:

Final Answer: D

=====

Answer Option 9:

Final Answer: B

=====

Question 12:

'Historically, it has been observed that computer processing speeds tend to double every two years. Which of the following best describes how technology companies can use this observation for planning purposes?', A. 'Technology companies can accurately predict the dates when new computing innovations will be available to use.', B. 'Technology companies can plan to double the costs of new products each time advances in processing speed occur.', C. 'Technology companies can set research and development goals based on anticipated processing speeds.', D. 'Technology companies can spend less effort developing new processors because processing speed will always improve at the observed rate.'

=====

Answer Option 1:

Final Answer: C

=====

Answer Option 2:

Final Answer: C

=====

Answer Option 3:

Final Answer: C

=====

Answer Option 4:

Final Answer: C

=====

Answer Option 5:

Final Answer: C

=====

Answer Option 6:

Final Answer: C

=====

Answer Option 7:

Final Answer: C

=====

Answer Option 8:

Final Answer: C

=====

Answer Option 9:

Final Answer: C

=====

Question 13:

'A programmer wrote the program below. The program uses a list of numbers called numList. The program is intended to display the sum of the numbers in the list.

```
sum ← numList [1]
FOR EACH value IN numList
    sum ← sum + value
DISPLAY sum
```

In order to test the program, the programmer initializes numList to [0 , 1 , 4 , 5]. The program displays 10, and the programmer concludes that the program works as intended. Which of the following is true?',

A. 'The conclusion is correct; the program works as intended.', B. 'The conclusion is incorrect; the program does not display the correct value for the test case [0, 1, 4, 5].', C. 'The conclusion is incorrect; using the test case [0, 1, 4, 5] is not sufficient to conclude the program is correct.', D. 'The conclusion is incorrect; using the test case [0, 1, 4, 5] only confirms that the program works for lists in increasing order.'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: C

Answer Option 3:

Final Answer: C

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: C

Answer Option 7:

Final Answer: C

Answer Option 8:

Final Answer: C

Answer Option 9:

Final Answer: C

Question 14:

'A computer simulation is created to simulate the growth of a certain plant species in different conditions. Which of the following actions could be used to validate the model used in the simulation?', A.

'Express the simulation software using both recursive and iterative algorithms. Compare the results of the recursive algorithm to those of the iterative algorithm.', B. 'Perform real-world experiments on the plant species' growth in different environments. Compare the experimental results to the results provided by the simulation.', C. 'Remove any unnecessary details from the model. Compare the running times of the original simulation and the simplified simulation.', D. 'Run the simulation software on multiple devices. Compare the results obtained from each of the devices.'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 15:

'Huffman coding assigns unique variable-length codes to input values based on the frequency of occurrence of each value. Frequently occurring values are assigned codes that contain fewer bits than values that occur less frequently, which are assigned codes that contain more bits. Which of the following best describes an appropriate use of Huffman coding?', A. 'Decryption', B. 'Efficient sorting', C. 'Lossless compression', D. 'Lossy compression'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: C

Answer Option 3:

Final Answer: C

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: C

Answer Option 6:

Final Answer: C

Answer Option 7:

Final Answer: C

Answer Option 8:

Final Answer: C

Answer Option 9:

Final Answer: C

Question 16:

'In Python 3, which of the following function checks in a string that all characters are in uppercase?', A. 'isupper()', B. 'join(seq)', C. 'len(string)', D. 'ljust(width[, fillchar])'

=====

Answer Option 1:

Final Answer: A

Answer Option 2:

Final Answer: A

Answer Option 3:

Final Answer: A

Answer Option 4:

Final Answer: A

Answer Option 5:

Final Answer: A

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: A

Answer Option 9:

Final Answer: A

Question 17:

The code fragment below is intended to display "odd" if the positive number num is odd.

IF (<MISSING CONDITION>)

DISPLAY "odd"

Which of the following can be used to replace <MISSING CONDITION> so that the code fragment will work as intended?, A. '(num MOD 1) = 0', B. '(num MOD 1) = 1', C. '(num MOD 2) = 0', D. '(num MOD 2) = 1'

=====

Answer Option 1:

Final Answer: D

Answer Option 2:

Final Answer: D

Answer Option 3:

Final Answer: D

Answer Option 4:

Final Answer: D

Answer Option 5:

Final Answer: D

Answer Option 6:

Final Answer: D

Answer Option 7:

Final Answer: D

Answer Option 8:

Final Answer: D

Answer Option 9:

Final Answer: D

Question 18:

'A programmer uses code published online under a Creative Commons Attribution (C C B Y) license in a commercial product. Which of the following best describes an acceptable use of the code?', A.

'Copying code from the online source into the programmer's product without any other actions', B. 'Copying code from the online source into the programmer's product and limiting the copied code to ten code

lines', C. 'Copying code from the online source into the programmer's product and changing all variable names', D. 'Copying code from the online source into the programmer's product and crediting the

original author in the manner indicated by the license'

=====

Answer Option 1:

Final Answer: D

Answer Option 2:

Final Answer: D

Answer Option 3:

Final Answer: D

Answer Option 4:

Final Answer: D

Answer Option 5:

Final Answer: D

Answer Option 6:

Final Answer: D

Answer Option 7:

Final Answer: D

Answer Option 8:

Final Answer: D

Answer Option 9:

Final Answer: D

Question 19:

'A new bank plans to make customer convenience a priority by minimizing the amount of time a customer waits in line. The bank is considering two options: a single line where the customer at the front waits for the next available teller, or separate lines for each teller. The bank decides to use a computer simulation of these two options to determine the average wait time for customers. Which of the following is NOT true about the bank's plan?', A. 'The bank can incorporate other factors, such as the number of tellers, in the simulation.', B. 'The bank can use the simulation to investigate these two options without causing inconvenience for customers.', C. 'The bank may consider new alternatives based on the simulation results.', D. 'The simulation will not produce usable results because actual customer data are not available.'

=====

Answer Option 1:

Final Answer: D

Answer Option 2:

Final Answer: D

Answer Option 3:

Final Answer: D

Answer Option 4:

Final Answer: D

Answer Option 5:

Final Answer: D

Answer Option 6:

Final Answer: D

Answer Option 7:

Final Answer: D

Answer Option 8:

Final Answer: D

Answer Option 9:

Final Answer: D

Question 20:

'Which of the following best explains how data is typically assembled in packets for transmission over the Internet?', A. 'Each packet contains data to be transmitted, along with metadata containing information used for routing the data.', B. 'Each packet contains an encrypted version of the data to be transmitted, along with metadata containing the key needed to decrypt the data.', C. 'Each packet contains only the metadata used to establish a direct connection so that the data can be transmitted.', D. 'Each packet contains multiple data files bundled together, along with metadata describing how to categorize each data file.'

=====

Answer Option 1:

Final Answer: A

Answer Option 2:

Final Answer: A

Answer Option 3:

Final Answer: A

Answer Option 4:

Final Answer: A

Answer Option 5:

Final Answer: A

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: A

Answer Option 9:

Final Answer: A

Question 21:

'A method is to be written to search an array for a value that is larger than a given item and return its index. The problem specification does not indicate what should be returned if there are several such values in the array. Which of the following actions would be best?', A. 'The method should be written on the assumption that there is only one value in the array that is larger than the given item.', B. 'The method should be written so as to return the index of every occurrence of a larger value.', C. 'The specification should be modified to indicate what should be done if there is more than one index of larger values.', D. 'The method should be written to output a message if more than one larger value is found.'

=====

Answer Option 1:

Final Answer: C

=====

Answer Option 2:

Final Answer: C

=====

Answer Option 3:

Final Answer: C

=====

Answer Option 4:

Final Answer: C

=====

Answer Option 5:

Final Answer: C

=====

Answer Option 6:

Final Answer: C

=====

Answer Option 7:

Final Answer: C

=====

Answer Option 8:

Final Answer: C

=====

Answer Option 9:

Final Answer: C

=====

Question 22:

'What is the output of the statement "a" + "ab" in Python 3?'; A. 'Error', B. 'aab', C. 'ab', D. 'a ab'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 23:

'In python 3, which of the following is floor division?', A. '/', B. '//', C. '%', D. '|'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 24:

'Which of the following school policies is most likely to have a positive impact on the digital divide?', A. 'A school allows students to bring a graphing calculator from home to complete in-class mathematics assignments.', B. 'A school allows students to bring a tablet computer to class every day to participate in graded quizzes.', C. 'A school provides a laptop or tablet computer to all students enrolled at the school.', D. 'A school recommends that all students purchase a computer with as much processing speed as possible so that projects run faster.'

=====

Answer Option 1:

Final Answer: C

=====

Answer Option 2:

Final Answer: C

=====

Answer Option 3:

Final Answer: C

=====

Answer Option 4:

Final Answer: C

=====

Answer Option 5:

Final Answer: C

=====

Answer Option 6:

Final Answer: C

=====

Answer Option 7:

Final Answer: C

=====

Answer Option 8:

Final Answer: C

=====

Answer Option 9:

Final Answer: C

=====

Question 25:

'In a certain country, a person must be at least 16 years old to drive a car and must be at least 18 years old to vote. The variable age represents the age of a person as an integer. Which of the following expressions evaluates to true if the person is old enough to drive but not old enough to vote, and evaluates to false otherwise?

I. $(age \geq 16) \text{ AND } (age \leq 18)$

II. $(age \geq 16) \text{ AND } (\text{NOT}(age \geq 18))$

III. $(age < 18) \text{ AND } (\text{NOT}(age < 16))$ ', A. 'II only', B. 'I and II only', C. 'I and III only', D. 'II and III only'

=====

Answer Option 1:

Final Answer: D

Answer Option 2:

Final Answer: D

Answer Option 3:

Final Answer: D

Answer Option 4:

Final Answer: D

Answer Option 5:

Final Answer: D

Answer Option 6:

Final Answer: D

Answer Option 7:

Final Answer: D

Answer Option 8:

Final Answer: D

Answer Option 9:

Final Answer: D

Question 26:

'An online store uses 6-bit binary sequences to identify each unique item for sale. The store plans to increase the number of items it sells and is considering using 7-bit binary sequences. Which of the following best describes the result of using 7-bit sequences instead of 6-bit sequences?', A. '2 more items can be uniquely identified.', B. '10 more items can be uniquely identified.', C. '2 times as many items can be uniquely identified.', D. '10 times as many items can be uniquely identified.'

=====

Answer Option 1:

Final Answer: C

=====

Answer Option 2:

Final Answer: C

=====

Answer Option 3:

Final Answer: C

=====

Answer Option 4:

Final Answer: C

=====

Answer Option 5:

Final Answer: C

=====

Answer Option 6:

Final Answer: C

=====

Answer Option 7:

Final Answer: C

=====

Answer Option 8:

Final Answer: C

=====

Answer Option 9:

Final Answer: C

=====

Question 27:

'Which of the following programs is most likely to benefit from the use of a heuristic?', A. 'A program that calculates a student's grade based on the student's quiz and homework scores', B. 'A program that encrypts a folder of digital files', C. 'A program that finds the shortest driving route between two locations on a map', D. 'A program that sorts a list of numbers in order from least to greatest'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: C

Answer Option 3:

Final Answer: C

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: C

Answer Option 6:

Final Answer: C

Answer Option 7:

Final Answer: C

Answer Option 8:

Final Answer: C

Answer Option 9:

Final Answer: C

Question 28:

Consider the following code segment.

```
int num1 = value1, num2 = value2, num3 = value3;
```

```
while (num1 > num2 || num1 > num3)
```

```
{
```

```
/* body of loop */
```

```
}
```

You may assume that value1, value2, and value3 are int values. Which of the following is sufficient to guarantee that /* body of loop */ will never be executed?, A. 'num1 < num2', B. 'num1 < num3', C. 'num1 >

num2 && num1 > num3', D. 'num1 < num2 && num1 < num3'

=====

Answer Option 1:

Final Answer: D

Answer Option 2:

Final Answer: D

Answer Option 3:

Final Answer: D

Answer Option 4:

Final Answer: D

Answer Option 5:

Final Answer: D

Answer Option 6:

Final Answer: D

Answer Option 7:

Final Answer: D

Answer Option 8:

Final Answer: D

Answer Option 9:

Final Answer: D

Question 29:

Two lists, list1 and list2, contain the names of books found in two different collections. A librarian wants to create newList, which will contain the names of all books found in either list, in alphabetical order, with duplicate entries removed.

For example, if list1 contains

["Macbeth", "Frankenstein", "Jane Eyre"]

and list2 contains

["Frankenstein", "Dracula", "Macbeth", "Hamlet"],

then newList will contain

["Dracula", "Frankenstein", "Hamlet", "Jane Eyre", "Macbeth"].

The following procedures are available to create newList.

Procedure

Explanation

Sort (list)

Sorts list in alphabetical order and returns the resulting list.

Combine (list1, list2)

Creates a new list consisting of the entries from

list1 followed by the entries from list2. The resulting list is returned.

RemoveDuplicates (list)

Iterates through list. If any two or more entries have the same value, the duplicate entries are removed so that any entry appears at most once. The resulting list is returned.

Which of the following code segments will correctly create newList?, A. 'newList ← Combine (list1, list2)

newList ← Sort (newList)

newList ← RemoveDuplicates (newList), B. 'list1 ← Sort (list1)

list2 ← Sort (list2)

newList ← Combine (list1, list2)

newList ← RemoveDuplicates (newList), C. 'list1 ← RemoveDuplicates (list1)

list2 ← RemoveDuplicates (list2)

newList ← Combine (list1, list2)

newList ← Sort (newList), D. 'list1 ← RemoveDuplicates (list1)

list1 ← Sort (list1)

list2 ← RemoveDuplicates (list2)

list2 ← Sort (list2)

newList ← Combine (list1, list2)

=====

Answer Option 1:

Final Answer: A

Answer Option 2:

Final Answer: A

Answer Option 3:

Final Answer: A

Answer Option 4:

Final Answer: A

Answer Option 5:

Final Answer: A

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: A

Answer Option 9:

Final Answer: A

Question 30:

'Are Python variable names case-sensitive?', A. 'Yes', B. 'No', C. 'It's machine-dependent', D. 'None of the above'

=====

Answer Option 1:

Final Answer: A

=====

Answer Option 2:

Final Answer: A

=====

Answer Option 3:

Final Answer: A

=====

Answer Option 4:

Final Answer: A

=====

Answer Option 5:

Final Answer: A

=====

Answer Option 6:

Final Answer: A

=====

Answer Option 7:

Final Answer: A

=====

Answer Option 8:

Final Answer: A

=====

Answer Option 9:

Final Answer: A

=====

Question 31:

'A computer program uses 3 bits to represent integers. When the program adds the decimal (base 10) numbers 5 and 3, the result is 0. Which of the following is the best explanation for the result?', A. 'An overflow error occurred.', B. 'A round-off error occurred.', C. 'The result was affected by lossy data compression.', D. 'The result was approximated by a floating-point representation.'

=====

Answer Option 1:

Final Answer: A

Answer Option 2:

Final Answer: A

Answer Option 3:

Final Answer: A

Answer Option 4:

Final Answer: A

Answer Option 5:

Final Answer: A

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: A

Answer Option 9:

Final Answer: A

Question 32:

'Which is the largest asymptotically?', A. ' $O(1)$ ', B. ' $O(n)$ ', C. ' $O(n^2)$ ', D. ' $O(\log n)$ '

=====

Answer Option 1:

Final Answer: C

=====

Answer Option 2:

Final Answer: C

=====

Answer Option 3:

Final Answer: C

=====

Answer Option 4:

Final Answer: C

=====

Answer Option 5:

Final Answer: C

=====

Answer Option 6:

Final Answer: C

=====

Answer Option 7:

Final Answer: C

=====

Answer Option 8:

Final Answer: C

=====

Answer Option 9:

Final Answer: C

=====

Question 33:

'A programmer wrote the code segment below to display the average of all the elements in a list called numbers. There is always at least one number in the list.

Line 1: count \leftarrow 0

Line 2: sum \leftarrow 0

Line 3: FOR EACH value IN numbers

Line 4: {

Line 5: count \leftarrow count + 1

Line 6: sum \leftarrow sum + value

Line 7: average \leftarrow sum / count

Line 8: }

Line 9: DISPLAY (average)

The programmer wants to reduce the number of operations that are performed when the program is run. Which change will result in a correct program with a reduced number of operations performed?', A.

'Interchanging line 1 and line 2', B. 'Interchanging line 5 and line 6', C. 'Interchanging line 6 and line 7', D. 'Interchanging line 7 and line 8'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: D

Answer Option 3:

Final Answer: D

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: C

Answer Option 6:

Final Answer: D

Answer Option 7:

Final Answer: C

Answer Option 8:

Final Answer: D

Answer Option 9:

Final Answer: C

Question 34:

'Both online newspapers and social media sites are used to distribute information on the Internet. Which of the following best describes an advantage that online newspapers have over social media sites?', A. 'The ability to distribute information instantaneously', B. 'The ability to provide credibility to the information distributed', C. 'The ability to provide information that is widely accessible', D. 'The ability to provide media-rich content for low cost'

=====

Answer Option 1:

Final Answer: B

=====

Answer Option 2:

Final Answer: B

=====

Answer Option 3:

Final Answer: B

=====

Answer Option 4:

Final Answer: B

=====

Answer Option 5:

Final Answer: B

=====

Answer Option 6:

Final Answer: B

=====

Answer Option 7:

Final Answer: B

=====

Answer Option 8:

Final Answer: B

=====

Answer Option 9:

Final Answer: B

=====

Question 35:

'A large Java program was tested extensively, and no errors were found. What can be concluded?', A. 'All of the preconditions in the program are correct.', B. 'All of the postconditions in the program are correct.', C. 'The program may have bugs.', D. 'Every method in the program may safely be used in other programs.'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: C

Answer Option 3:

Final Answer: C

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: C

Answer Option 6:

Final Answer: C

Answer Option 7:

Final Answer: C

Answer Option 8:

Final Answer: C

Answer Option 9:

Final Answer: C

Question 36:

'What is the value of this python expression: 1 + 3 % 3?', A. '0', B. '1', C. '3', D. '4'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 37:

'Each student that enrolls at a school is assigned a unique ID number, which is stored as a binary number. The ID numbers increase sequentially by 1 with each newly enrolled student. If the ID number assigned to the last student who enrolled was the binary number 1001 0011, what binary number will be assigned to the next student who enrolls?', A. '1001 0100', B. '1001 0111', C. '1101 0100', D. '1101 0111'

=====

Answer Option 1:

Final Answer: A

Answer Option 2:

Final Answer: A

Answer Option 3:

Final Answer: A

Answer Option 4:

Final Answer: A

Answer Option 5:

Final Answer: A

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: A

Answer Option 9:

Final Answer: A

Question 38:

'In Python 3, which of the following operator in python performs exponential (power) calculation on operands?', A. '**', B. '//', C. 'is', D. 'not in'

=====

Answer Option 1:

Final Answer: A

=====

Answer Option 2:

Final Answer: A

=====

Answer Option 3:

Final Answer: A

=====

Answer Option 4:

Final Answer: A

=====

Answer Option 5:

Final Answer: A

=====

Answer Option 6:

Final Answer: A

=====

Answer Option 7:

Final Answer: A

=====

Answer Option 8:

Final Answer: A

=====

Answer Option 9:

Final Answer: A

=====

Question 39:

'Which of the following is the hexadecimal representation of the decimal number 231_{10} ?', A. ' 17_{16} ', B. ' $E4_{16}$ ', C. ' $E7_{16}$ ', D. ' $F4_{16}$ '

=====

Answer Option 1:

Final Answer: C

=====

Answer Option 2:

Final Answer: C

=====

Answer Option 3:

Final Answer: C

=====

Answer Option 4:

Final Answer: C

=====

Answer Option 5:

Final Answer: C

=====

Answer Option 6:

Final Answer: C

=====

Answer Option 7:

Final Answer: C

=====

Answer Option 8:

Final Answer: C

=====

Answer Option 9:

Final Answer: C

=====

Question 40:

'Which of the following spreadsheet functions would be most useful for detecting improbably high or low values that have become part of a data set as a result of data entry errors?', A. 'A function that averages numeric values in a column or row', B. 'A function that counts the values in a column or row', C. 'A function that rounds a numeric value', D. 'A function that sorts values in a column or row'

=====

Answer Option 1:

Final Answer: D

=====

Answer Option 2:

Final Answer: D

=====

Answer Option 3:

Final Answer: D

=====

Answer Option 4:

Final Answer: D

=====

Answer Option 5:

Final Answer: D

=====

Answer Option 6:

Final Answer: D

=====

Answer Option 7:

Final Answer: D

=====

Answer Option 8:

Final Answer: D

=====

Answer Option 9:

Final Answer: D

=====

Question 41:

'A certain computer game is played between a human player and a computer-controlled player. Every time the computer-controlled player has a turn, the game runs slowly because the computer evaluates all potential moves and selects the best one. Which of the following best describes the possibility of improving the running speed of the game?', A. 'The game's running speed can only be improved if the game is played between two human players instead of with the computer-controlled player.', B. 'The game's running speed might be improved by using a process that finds approximate solutions every time the computer-controlled player has a turn.', C. 'The game's running speed cannot be improved because computers can only be programmed to find the best possible solution.', D. 'The game's running speed cannot be improved because the game is an example of an algorithm that does not run in a reasonable time.'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 42:

'In Python 3, what is the output of print list[1:3] if list = ['abcd', 786 , 2.23, 'john', 70.2]?', A. ['abcd', 786 , 2.23, 'john', 70.2]', B. 'abcd', C. [786, 2.23], D. 'None of the above.'

=====

Answer Option 1:

Final Answer: C

=====

Answer Option 2:

Final Answer: C

=====

Answer Option 3:

Final Answer: C

=====

Answer Option 4:

Final Answer: C

=====

Answer Option 5:

Final Answer: C

=====

Answer Option 6:

Final Answer: C

=====

Answer Option 7:

Final Answer: C

=====

Answer Option 8:

Final Answer: C

=====

Answer Option 9:

Final Answer: C

=====

Question 43:

Consider the code segment below.

Line 1: IF (a = 0)

Line 2: {

Line 3: b \leftarrow a + 10

Line 4: }

Line 5: ELSE

Line 6: {

Line 7: b \leftarrow a + 20

Line 8: }

Which of the following changes will NOT affect the results when the code segment is executed?, A. 'Changing line 3 to b \leftarrow 10', B. 'Changing line 3 to a \leftarrow b + 10', C. 'Changing line 7 to b \leftarrow 20', D. 'Changing line 7 to a \leftarrow b + 10'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: C

Answer Option 3:

Final Answer: C

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: C

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: C

Answer Option 9:

Final Answer: C

Question 44:

'A sorted list of 120 integers is to be searched to determine whether the value 100 is in the list. Assuming that the most efficient searching algorithm is used, what is the maximum number of elements that must be examined?', A. '7', B. '8', C. '20', D. '100'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 45:

'Which of the following is correct about Python?', A. 'It supports automatic garbage collection.', B. 'It can be easily integrated with C, C++, COM, ActiveX, CORBA, and Java.', C. 'Both of the above.', D. 'None of the above.'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: C

Answer Option 3:

Final Answer: C

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: C

Answer Option 6:

Final Answer: C

Answer Option 7:

Final Answer: C

Answer Option 8:

Final Answer: C

Answer Option 9:

Final Answer: C

Question 46:

'Let x = 8. What is x>>1 in Python 3?', A. '3', B. '4', C. '2', D. '8'

=====

Answer Option 1:

Final Answer: B

Answer Option 2:

Final Answer: B

Answer Option 3:

Final Answer: B

Answer Option 4:

Final Answer: B

Answer Option 5:

Final Answer: B

Answer Option 6:

Final Answer: B

Answer Option 7:

Final Answer: B

Answer Option 8:

Final Answer: B

Answer Option 9:

Final Answer: B

Question 47:

The color of a pixel can be represented using the RGB (Red, Green, Blue) color model, which stores values for red, green, and blue, each ranging from 0 to 255. How many bits (binary digits) would be needed to represent a color in the RGB model?, A. '8', B. '16', C. '24', D. '32'

=====

Answer Option 1:

Final Answer: C

Answer Option 2:

Final Answer: C

Answer Option 3:

Final Answer: C

Answer Option 4:

Final Answer: C

Answer Option 5:

Final Answer: C

Answer Option 6:

Final Answer: C

Answer Option 7:

Final Answer: C

Answer Option 8:

Final Answer: C

Answer Option 9:

Final Answer: C

Question 48:

'The boolean expression $a[i] == \max \parallel \neg(\max \neq a[i])$ can be simplified to', A. ' $a[i] == \max$ ', B. ' $a[i] \neq \max$ ', C. ' $a[i] < \max \parallel a[i] > \max$ ', D. 'FALSE'

=====

Answer Option 1:

Final Answer: A

Answer Option 2:

Final Answer: A

Answer Option 3:

Final Answer: A

Answer Option 4:

Final Answer: A

Answer Option 5:

Final Answer: A

Answer Option 6:

Final Answer: A

Answer Option 7:

Final Answer: A

Answer Option 8:

Final Answer: A

Answer Option 9:

Final Answer: A

Question 49:

'A programmer is deciding between using a linear or binary search to find a target value in a sorted list. Which of the following is true?', A. 'In all cases, a binary search of a sorted list requires fewer comparisons than a linear search.', B. 'Generally, the advantage of using a binary search over a linear search increases as the size of the list increases.', C. 'A linear search will generally run faster than a binary search because a linear search requires fewer lines of code to implement.', D. 'Using a linear search is preferable to using a binary search if there is a chance that the target may not be found in the list.'

=====

Answer Option 1:

Final Answer: B

=====

Answer Option 2:

Final Answer: B

=====

Answer Option 3:

Final Answer: B

=====

Answer Option 4:

Final Answer: B

=====

Answer Option 5:

Final Answer: B

=====

Answer Option 6:

Final Answer: B

=====

Answer Option 7:

Final Answer: B

=====

Answer Option 8:

Final Answer: B

=====

Answer Option 9:

Final Answer: B

=====

Question 50:

'Which types of functions grow the slowest?', A. ' $O(\log e^N)$ ', B. ' $O(\log N)$ ', C. ' $O(\log \log N)$ ', D. ' $O(N)$ '

=====

Answer Option 1:

Final Answer: C

=====

Answer Option 2:

Final Answer: C

=====

Answer Option 3:

Final Answer: C

=====

Answer Option 4:

Final Answer: C

=====

Answer Option 5:

Final Answer: C

=====

Answer Option 6:

Final Answer: C

=====

Answer Option 7:

Final Answer: C

=====

Answer Option 8:

Final Answer: C

=====

Answer Option 9:

Final Answer: C

=====