1.

Which of the following statements describes Computer Science?

The study of problems with solutions

The study of problems with no solutions

The study of algorithms

All of the above (this)

2.

In which format is data stored in a computer?

Hard disk

Binary

Decimal

Electricity

None of the above (this)

3.

Which of the following aspects of https://proctor.andela.com best demonstrates abstraction?

You need a username and password to log in

You need internet access to use it

You don’t need to know how the website was made to use it (this)

You have multiple sections to complete

None of the above

4.

What is an algorithm?

A piece of code meant to solve only hard problems

A list of instructions

A long block of code

A set of commands that lead to a solution for a problem (this)

None of the above

5.

Which of the following industries does NOT need computer scientists?

Medical

Banking

Education

Space Exploration

None of the above (this)

6.

What is the metric for analyzing the worst-case scenario of algorithms in terms of scalability and efficiency called?

Parallelism

Big Data

Recursion

Big O Notation (this)

7.

Which of the following statements IS TRUE about Computer Scientists?

They design software but not computers

They apply innovation and expertise to complex problems (this)

They are just programmers

All of the above

None of the above

8.

The act of making something happen on its own, i.e. without any external help or human interference, is called?

Engineering

Abstraction

Automation (this)

Simulation

SECTION 2

Complete the questions below:

1.

Which of the following CANNOT be looped over?

List

String

Dict

Int (this)

None of the above

2.

What does the expression [] is [ ] evaluate to and why?

True, because both are empty lists (this)

False, because one has a space inside

True, because they refer to the same object in memory

False, because they refer to different objects in memory

None of the above

3.

Which of the following is not an element of a programming language?

File I/O

Functions

Environment setup (this)

Basic syntax

None of the above

4.

Which of the following best represents the set of features that should be present in a programming language for it to be useful in algorithm implementation?

Data structures, variables, abstract data types and binary digits

Assignment operators, arithmetic operators and logical operators

Ability to execute instructions one after the other, statements for expressing conditional logic and functionality to repetitively execute instructions (this)

Strings, integers, lists and dictionaries

5.

Which of the following is not a programming language?

HTML (this)

Clojure

Smalltalk

Python

All of the above are programming languages

6.

Which of the following programming languages requires a compiler?

Python

Java (this)

PHP

Lisp

None of the above

7.

Which of the following statements can be used to generate the following list of numbers? [10, 8, 6, 4, 2]

list(reversed([2, 4, 6, 8, 10]))

sorted(list({4, 2, 8, 6, 10}), reverse=True)

list(range(10, 0, -2)) (this)

None of the above

A & C

8.

What 3 things are important setup to start programming in any language?

A text editor, compiler, internet

A text editor, compiler, interpreter (this)

Internet, web browser, interpreter

A compiler, internet, web browser

9.

A computer program...

Specifies tasks for the computer

Runs a specified task (this)

Is an unordered set of instructions

All of the above

None of the above

10.

What does this code snippet do?

total = 0

for i in 1, 3, 7:

total = total + i

print(total)

This code prints the value in total which is the sum of the numbers 1, 3 and 7

This code prints 11 - the sum of the numbers 1, 3 and 7

The code reassigns to the total variable, the sum of the numbers 1,3,7 and prints it

All of the above (this)

B & C only

SECTION 3

Complete the questions below:

1.

Which of the following choices contains the terms that are most closely associated with Object Oriented Programming?

Abstraction, Inheritance, Polymorphism, Functions

Polymorphism, Methods, Encapsulation, Inheritance (this)

Encapsulation, Assignments, Polymorphism, Abstraction

Methods, Assignments, Encapsulation, Abstraction

None of the above

2.

Consider the following statements.

Class attributes are more suitable for sharing data across instances of a class as opposed to instance variables.

Instance variables always point to a common location in memory regardless of which instance of a class is used to access them

Abstraction cannot be utilized without Inheritance

In order to enable access to instance variables, functions must have a “self” argument.

Composition represents an “is-a” relationship between two entities.

Which combination of statements is true?

4, 3, 5, 1

1, 2, 3, 5

2, 3, 5, 4

5, 2, 4, 1 (this)

None of the above

3.

Which of the following scenarios depict true inheritance.

NB: -> represents the is a/an

Vehicle -> Car -> Truck

Pet -> Animal -> Dog

Person -> Employee -> Manager

User -> Admin -> Guest (this)

4.

Which of these is a valid interpretation of the expression foo = X()?

Create an object foo of class X

Assign variable foo an instance of X

Set foo to an instance of X

A and B

A, B and C (this)

5.

The code class X(object): def \_\_init\_\_(self, J) can be interpreted as:

Make a subclass X of class object that defines a constructor method that takes self and J as parameters

Make a class X of object with a constructor method that has as parameters self and J

Make a class X that inherits from an object class and has defined a constructor method that accepts as arguments the values of self and J

All of the above (this)

None of the above

SECTION 4

1.

Of the following statements, which ones can be said to be TRUE?

The time complexity of all single statements is constant

According to the Big O Notation, the time complexity of some statements can be said to be logarithmic

Time complexity can only be expressed by using the Big O notation

Time complexity can be expressed as a differential equation

The time complexity of an algorithm can vary over time

Quadratic time complexity can be expressed as a quadratic equation

1, 3 & 5

2 & 4

5, 2 & 6

2 & 6

2, 4 & 6 (this)

2.

You are writing a Python e-commerce program that reminds users of the contents of their wish list in the order that they put the items in. Which data structure best simulates the behavior you want to achieve?

List

Queue (this)

Array

Stack

Dictionary

3.

In relation to both primitive and complex data structures, what CANNOT be said to be TRUE?

Primitive data structures are used to represent semantically independent values whilst complex data structures are NOT

Complex data structures are used to represent interdependent values

Complex data structures are complicated to use whilst basic data structures are simple to use

Basic data structures can be used out of the box in a programming language

Complex data structures should only be used with a large data set

1 & 3

4 & 2 (this)

2 & 3

3 & 5

5 & 1

4.

You have a subscription input field on a client’s website and need a method to ensure that any email address and username in the client's database is unique. What should you use to achieve this?

An ordered list because Grace needs to know when each user subscribed to the website

A set because each username and email needs to be singular (this)

A slice because Grace will have to extract the names of each user from their email address

A dictionary because she needs to link each user's name to their email address

None of the above

5.

You are designing an algorithm that ranks website pages by relevance according to the number of times they are viewed by users. Which data structure would be the most useful and efficient for you to use?

A hash table because data would be efficiently searched and retrieved

A stack because the website pages would need to be popped and pushed systematically from the ranking list

A graph because Elizabeth needs data relating to how webpages are connected to each other and how many times they were viewed (this)

A sorted array because all the data relating to web pages needs to be sorted in a ranking order

None of the above

6.

What is the efficiency of an algorithm dependent on?

The time taken by the algorithm and memory consumption (this)

The data structure used and memory consumption

The time taken by the algorithm and data structure used

None of the above

A & B

7.

You are creating an inventory management system in Python. You want the following features:

The name of every item should be linked to its stock level and expiry date

The order of the items in the database is not a priority

You need to be able to easily lookup data for each item

Which is the best representation of the optimal data structure you should use to manage the data in this application?

Canned Soup , [45 , 16/12/2016]

‘Canned Soup’ ’45’ ’16/12/2016’

{ ‘Canned Soup’: [45, '16/12/2016'] } (this)

‘Canned Soup, 45, 16/12/2016’

[ ‘Canned Soup’ , 45 , 16/12/2016 ]

def inventory(item,stock\_level,expiry)

{ ‘Canned Soup’: 45, ‘Canned Soup’:16/12/2016 }

8.

What do data structures NOT do?

Optimise efficiency

Optimise speed (this)

Organise data

Classify data

C & D

9.

Which of the following best describes a list?

list = {1: “a”, 2: “b”, 3: “c”}

list = [1, 2, 3, ”abc”] (this)

list = (a, b, c, [1,2,3])

list = set([1, 2, 3])

None of the above

10.

Which of the following best describes a LIST comprehension?

lc = [ x \* 2 for x in [1, 2, 3] ] (this)

lc = {x for x in ‘apple’ if x not in [‘a’, ‘e’, ‘i’]}

lc = (x for x in ‘apple’ if x not in [‘a’, ‘e’, ‘i’])

lc = x \* 2 for x in [1, 2, 3]’

None of the above

SECTION 5

Complete the questions below:

1.

What statement BEST describes why the Big-O notation is a very useful way of analyzing algorithm complexity?

It is very easy to understand

It focuses on the performance of the algorithm itself, not of the hardware used to run the algorithm (this)

It gives the average case running time of an algorithm

It can be used for more than analyzing algorithms

2.

Which of the following is not a sorting algorithm?

Binary sort (this)

Heap sort

Merge sort

Quicksort

3.

Look at this code snippet which is supposed to print a series of numbers to the screen.

a = 1

while a:

a += 23

print a

What is wrong with this code snippet and how would you improve it?

a is being incremented by 23, it needs to be incremented by 1 instead

a was initialized to 1. It should have been initialized to 0

Printing a after every loop is inefficient. Print after the loop has ended.

The loop won’t end. It needs to have a stopping condition (this)

4.

What is the running time of Merge sort?

O(Log(N))

O(N\*Log(N)) (this)

O(N2)

O(N)

5.

Look at this code snippet:

def printer(n):

if(n <= 0):

return “Please enter a number greater than 0”

else:

for i in xrange(0,n):

print i

What is the running time of this algorithm?

O(N) (this)

O(Log(N))

O(N2)

O(1)

6.

Which of the following does the Big O notation denote?

Average case run time

Worst case run time (this)

Best case run time

Abstract case run time

7.

You want to sort the following list using the bubble sort algorithm [14,33,27,35,10]. What would be the result of the operation?

[5,7,13,15,17]

[35,33,27,14,10]

[10,14,27,33,35] (this)

[14,10,33,35,27]

The array cannot be sorted using the bubble sort algorithm

SECTION 6

Complete the questions below:

1.

Which of these instances BEST describes a scenario that will require you to use recursive functions?

Printing out numbers from one to ten

When you want to speed up your program

Arranging elements of a nested list in a particular order (this)

None of the above

2.

Recursive functions are considered to be elegant and clear but that comes with underlying costs. Which of these set of statements is the correct list of disadvantages of using recursive functions?

They support tail-optimisation, add clarity and use more space

They will always throw Stack Overflow Exceptions when processing big chunks of data, are slower than non-recursive functions and increase space requirements (this)

They are not-readable, their performance is slow when tail optimisation is performed

None of the above

3.

Consider this function:

def factorial(number):

if number == 0 :

return 1;

return number \* factorial(number-1)

What kind of recursion does it use?

Tail recursion (this)

Binary recursion

Augmenting recursion

None of the above

4.

How many recursive calls will the function in Question 3 make given a number input of 5?

4

5 (this)

6

7

5.

Do you need an IF-ELSE statement to prevent infinite recursion?

Yes

No

Sometimes (this)

SECTION 7

Complete the questions below:

1.

Suppose you have the following list of numbers to sort: [19, 1, 9, 7, 3, 10, 13, 15, 8, 12] which list represents the partially sorted list after three complete passes of bubble sort?

[1, 9, 19, 7, 3, 10, 13, 15, 8, 12]

[1, 9, 19, 7, 3, 10, 13, 15, 12, 8]

[1, 7, 3, 9, 10, 13, 8, 12, 15, 19]

[1, 3, 7, 9, 10, 8, 12, 13, 15, 19] (this)

2.

A linear search algorithm is more efficient that a binary search algorithm

True

False (this)

3.

Given the following list of numbers: [21, 1, 26, 45, 29, 28, 2, 9, 16, 49, 39, 27, 43, 34, 46, 40] which answer illustrates the list to be sorted after 2 recursive calls to mergesort?

[16, 49, 39, 27, 43, 34, 46, 40]

[21, 1, 26, 45]

[21]

[21,1] (this)

4.

Suppose you have the following list of numbers to sort: [15, 5, 4, 18, 12, 19, 14, 10, 8, 20] which list represents the partially sorted list after three complete passes of insertion sort?

[4, 5, 12, 15, 14, 10, 8, 18, 19, 20]

[15, 5, 4, 10, 12, 8, 14, 18, 19, 20]

[4, 5, 15, 18, 12, 19, 14, 10, 8, 20] (this)

[15, 5, 4, 18, 12, 19, 14, 8, 10, 20

5.

Suppose you have the following list of numbers to sort: [11, 7, 12, 14, 19, 1, 6, 18, 8, 20] which list represents the partially sorted list after three complete passes of selection sort? (nb: start with the largest item)

[11, 7, 12, 14, 8, 1, 6, 18, 19, 20] (this)

[11, 7, 12, 14, 1, 6, 8, 18, 19, 20]

[7, 11, 12, 14, 19, 1, 6, 18, 8, 20]

[7, 11, 12, 1, 6, 14, 8, 18, 19, 20]

SECTION 8

Complete the questions below:

1.

What BEST describes the term "Software"?

Software is executable code that serves some computational purpose

Software is a product developed using well-defined, scientific principles and methods

Software is a collection of executable programming code, associated libraries and documentations (this)

Software is code that serves a specific requirement

2.

What is the work of a systems software engineer?

A systems software engineer coordinates the construction and maintenance of a company's computer systems (this)

A systems software engineer analyzes user needs and design

A systems software engineer constructs and maintains general computer applications software

A systems software engineer develops packaged systems and systems software

3.

Which of the choices below include some steps taken in SDLC?

Feasibility study, testing, system analysis, software design

Testing, coding, modulation, disposition

Software design, system analysis, documentation, testing (this)

Iteration, product development, risk management, planning

4.

Which of the following statements best describes evolutionary/breadboard prototyping?

Building multiple functional prototypes of the various sub-systems then integrating all the available prototypes to form a complete system

Building functional prototypes with minimal functionality at the beginning which forms the basis of future prototypes on top of which the system is built (this)

A prototype is built using little effort with the minimum requirements of the system, and once the requirements are understood, the actual system is developed based off the prototype

None of the above

5.

Is it true that all software development process models have exactly the same phases?

Yes

No (this)

Sometimes

6.

Good software must be efficient, adaptable and cheap

True

False

7.

Which of the following software development process models is most popularly used in industries?

Waterfall model (this)

Spiral Model

V Model

Agile Model

8.

Is it TRUE that poorly designed software is more costly to maintain than correctly designed software?

True (this)

False

9.

Is it TRUE that Software engineers have other roles apart from just coding the software?

True (this)

False

New Section

1.

Suppose you type www.google.com into your browser address bar and hit ENTER, what happens?

The address is resolved to an IP address (this)

The address is converted to binary

The address is encrypted

The address is sent to the processor which then resolves it to Google

2.

What do WI-FI networks use to transmit data?

Infra-red

Microwaves

UV-Light

Radio waves (this)

3.

Which of the following ports is wrongly matched?

80::HTTP

443::SMTPS (this)

23::Telnet

25::SMTP

4.

Which of the following status codes are NOT correctly matched?

404 - Page not found

200 - OK

201 - Not authorized (this)

301 - Moved permanently

5.

Which of the following is NOT a HTTP verb?

GET

POST

ADD (this)

DELETE

6.

Which of the following statements is TRUE?

The REST protocol uses XML inside of HTTP commands.

The REST protocol uses HTTP verbs (this)

The SOAP protocol uses HTTP verbs

The SOAP protocol is an extension of the REST protocol

7.

Which of the following statements best describes MIME types?

MIME types are format type identifiers for content transmitted over the internet (this)

MIME types are sound format types

MIME types are communication protocols

MIME types are hardware specifications

8.

A host computer that is capable of providing information to others is known as a server. Which of the following does NOT describe a client?

Receives and responds to requests from remote computers (this)

Sends requests to a remote computer

Displays information in a way a user can understand

A computer with a web browser installed

9.

Which of the following best describes HTTP (Hypertext Transfer Protocol)?

It is the standard protocol that is used to resolve domain names to IP addresses (this)

It is the protocol that is used to uniquely identify every resource on the web

It is the protocol responsible for requesting and transmitting web pages

This is the main protocol used in the Internet Layer of the TCP/IP Model

10.

What is a protocol, as specified in a networking context?

It is a process that operates on a specific layer in a networking model

It is a rule specifying a standard way of communicating (this)

It is an address that uniquely identifies Internet resources

It is a way that allows accessibility of the web

SECTION 9

Complete the questions below:

1.

You provide the wrong username and password, what status code is the browser supposed to return?

200

401 (this)

501

503

2.

The following endpoint is used to retrieve users info in a sample API: www.books.com/users/:id

There are four records in the database with IDs 1, 2, 3 and 4.

To get the user with id=1, you invoke www.books.com/users/1.

What status code do you expect to receive when you invoke www.books.com/users/5?

200

404 (this)

400

500

3.

How do you add a class 'modal' to the paragraph in the markup below.

<div class="paragraph"> <p>This is Andela.</p> </div>

document.getElementByTag('paragraph') = 'modal';

addClass = 'modal';

document.getElementById("paragraph") = 'modal';

document.getElementByTag('p').className = 'modal'; (this)

4.

Choose the correct HTML element for the smallest heading:

<h6> (this)

<heading>

<head>

<h1>

5.

What is the correct HTML for making a checkbox?

<checkbox>

<input type="check">

<input type="checkbox"> (this)

<check>

6.

What is the correct HTML for inserting an image?

<img src="image.gif" alt="MyImage"> (this)

<img href="image.gif" alt="MyImage">

<image src="image.gif" alt="MyImage">

<img alt="MyImage">image.gif</img>

7.

How do you write HTML comments?

# comment #

# comment

/\*\* comment \*/

<!-- comment --> (this)

8.

What does CSS stand for?

Colorful Style Sheets

Cascading Style Sheets (this)

Creative Style Sheets

Computer Style Sheets

9.

What is the correct HTML for referring to an external style sheet?

<stylesheet>mystyle.css </stylesheet>

<style src="mystyle.css">

<link rel="stylesheet" type="text/css" href="mystyle.css"> (this)

<link rel="stylesheet" type="text/css" src="mystyle.css">

10.

Which is the correct CSS syntax?

{body;color:black;}

body:color=black;

body {color: black;} (this)

{body:color=black;}

11.

How do you make each character in each word in a sentence have ALL capital letters?

You can't do that with CSS

text-transform:capitalize

text-transform:uppercase (this)

text-transform:uppercase-first

12.

JavaScript is a subset of Java

True

False (this)

13.

Which HTML tag are JavaScript scripts written in?

<javascript>

<script> (this)

<scripting>

<js>

14.

How do you display a border like this: The top border = 10 pixels, The bottom border = 5 pixels, The left border = 20 pixels, The right border = 1 pixel?

border-width:10px 1px 5px 20px; (this)

border-width:10px 5px 20px 1px;

border-width:10px 20px 5px 1px;

border-width:5px 20px 10px 1px;

15.

When writing CSS, how do you select an element with id "demo"?

demo

.demo

#demo (this)

\*demo

16.

Where is the correct place to insert an external JavaScript script file?

The <head> section

The <body> section

Inside <script> tags

Both <head> and <body> section are correct (this)

17.

What is the correct syntax for referring to an external script called "xxx.js"?

<script href="xxx.js">

<script name="xxx.js">

<script type=”xxx.js”>

<script src="xxx.js"> (this)

18.

How do you write "alert" in an alert box?

alert("\alert\");

alert("alert") (this)

msg("alert")

alertBox("alert")

19.

How do you write an IF statement in JavaScript?

if (i === 5) } (this)

if i == 5 then

if i = 5 then

if i = 5

20.

How can you add a comment in a JavaScript?

<!--This is a comment-->

'This is a comment

//This is a comment (this)

‘ ’ ’ This is a comment

21.

What is the correct way to write a JavaScript array?

var colors = ["red", "green", "blue"] (this)

var colors = (1:"red", 2:"green", 3:"blue")

var colors = "red", "green", "blue"

var colors = 1 = ("red"), 2 = ("green"), 3 = ("blue")

22.

What does the following mean? <=

equals less

less than or greater than

less than or equal to (this)

None of the above

23.

If I concatenate ‘7’ and ‘10’, what will the result be?

7&10

17

170

710 (this)

24.

What is the function of += in javascript?

It adds two objects (this)

It concatenates two strings

It increments a number by 1

It adds two to a number

25.

How do you reference an array element?

myStudent[element] (this)

myStudent(element)

myStudent:element

myStudent{element};

26.

What is the name of a program used to type in HTML codes?

Browser

Text editor (this)

Source

Internet Explorer

27.

What does MVC stand for?

Message, Verbs and Circuit

Model, View and Controller (this)

Model, View, and Circuit

Message, Verbs and Codes

28.

What are the four major components of MVC?

Routes, Models, Views and Controllers (this)

Routes, Message, Database and Verbs

Message, Routes, Controllers and Database

Database, Models, Controllers and Views

SECTION 10