codebash

OCR GCSE (9-1) Computer Science J277

J277/02 Diagnostic Test

Computational thinking, algorithms and programming

Time allowed: 40 minutes **Total: 40 marks**

Name _____

Class _____

Instructions

- There are 40 questions. Each has four options, A, B, C and D, and only one is correct.
- Circle your answers on the answer sheet at the back of this booklet. You may use the question pages for working, but only the answer sheet is marked.
- Each question is worth 1 mark. There are no marks taken off for wrong answers.
- This is a diagnostic test: your wrong answers tell your teacher exactly what to reteach. If you have no idea at all, leave the question blank rather than guessing.
- Code is written in OCR Exam Reference Language unless a question says it is Python.

1 Which of these is the best definition of a syntax error?

A A missing bracket at the end of a line of code, such as print("Hi"

B An error where the program runs but gives the wrong result

C An error that breaks the rules of the programming language, so the code cannot be translated

D An error caused by the user typing the wrong type of data

2 Look at this code. What happens when line 02 runs?

```
01  temp = 21
02  print(temp)
```

A A syntax error, because temp is not in quotation marks

B The word temp is output

C A runtime error, because print needs a string

D 21 is output

3 A program must check that total is between 10 and 20 inclusive. Which condition is correct?

A `if total >= 10 and <= 20 then`

B `if total >= 10 and total <= 20 then`

C `if total > 10 and total < 20 then`

D `if total >= 10 or total <= 20 then`

4 Which line correctly checks that score is at least 50?

A `if score >= 50 then`

B `if score ≥ 50 then`

C `if score => 50 then`

D `if score = 50 then`

5 Which line stores the value 3 in the variable lives?

A `lives == 3`

B `if lives = 3 then`

C `lives = 3`

D 3 = lives

6 What are the values of 17 MOD 5 and 17 DIV 5?

A 17 MOD 5 = 3 and 17 DIV 5 = 2

B 17 MOD 5 = 2 and 17 DIV 5 = 3

C 17 MOD 5 = 2 and 17 DIV 5 = 3.4

D 17 MOD 5 = 3.4 and 17 DIV 5 = 2

7 In a flowchart, what must every decision symbol have?

A One exit arrow leading to the next step

B Two exit arrows, which do not need labels because the arrows show the direction

C An arrow that leads back to Start, so the program can repeat

D Two exit arrows, labelled with the outcomes such as Yes and No

8 This code should calculate the cost of seats at £8 each. The user enters 3. Which statement about this code is correct?

```
01  seats = input("How many seats? ")
02  cost = seats * 8
```

A seats holds the string "3", so it must be cast to an integer before multiplying

B input() returns an integer here, so cost will be 24

C cost must be cast with str() before the calculation will work

D seats * 8 must be written as 8 * seats for the calculation to work

9 Which line fixes the error in this code?

```
01  total = 42
02  print("Total: " + total)
```

A `print("Total: " + int(total))`

B `print("Total: " + str(total))`

C `print("Total: " + "total")`

D total = int(42)

10 word1 = "Code" and word2 = "Bash". Which line stores "CodeBash" in the variable message?

A `message = word1, word2`

B `message = word1 + word2`

C `print(word1 + word2)`

D `message = "word1" + "word2"`

11 A question tells you to use the variable highScore. Which line would be accepted?

A `highScore = 0`

B `high score = 0`

C `highscores = 0`

D `highScore == 0`

12 name = "maria" and age = 15. Which expression gives "MAR15"?

A `name.left(3).upper + str(age)`

B `name.upper + str(age)`

C `name.left(3).upper + age`

D `str(name.left(3)).upper + int(age)`

13 What is stored in code after this line runs?

```
01  code = "AB" + str(int("7") * 2)
```

A `"AB77"`

B `"AB14"`

C An error, because "7" cannot be cast

D `"AB72"`

14 The array names holds 5 items. Which expression should go in the gap so the loop checks each item?

```
01  for i = 0 to 4
02      if __________ == target then
03          print("Found")
04      endif
05  next i
```

A `names`

B `names[i, 0]`

C `names[target]`

D `names[i]`

15 How many numbers does this code output?

```
01  for i = 0 to 5
02      print(i)
03  next i
```

A 5

B 4

C 6

D 7

16 A program works out a taxi fare from the distance travelled. Which of these is an input to the program?

A The distance travelled, in miles

B The taxi journey itself

C Working out the fare

D The fare the passenger pays

17 What happens when this Python code runs?

```
01  scores = [12, 7, 30]
02  for s in scores:
03      print(scores[s])
```

A 12, 7 and 30 are output, one on each line
B 0, 1 and 2 are output, one on each line
C 12 is output three times, because s does not change
D An error, because s holds 12, which is not a valid index

18 prices holds [4, 5, 6]. What is output?

```
01  for i = 0 to 2
02      total = 0
03      total = total + prices[i]
04  next i
05  print(total)
```

A 15
B 0
C 6
D 4

19 What does addUp([3, 4, 5]) return?

```
01  function addUp(nums)
02      total = 0
03      for i = 0 to nums.length - 1
04          total = total + nums[i]
05          return total
06      next i
07  endfunction
```

A 3
B 12
C 0
D 7

20 The function area should give back the area so that x = area(3, 4) stores 12 in x. Which line should go in the gap?

```
01  function area(w, h)
02      __________
03  endfunction
```

A `return w * h`
B `print(w * h)`
C `area = w * h`
D `w = w * h`

21 What is wrong with this function?

```
01  function move(position, steps)
02      steps = int(input("Steps: "))
03      return position + steps
04  endfunction
```

A Nothing: asking for input inside a function is good practice
B position should also be input inside the function
C steps must be a global variable to be used here
D The value passed in as steps is overwritten, so the parameter is ignored

22 bonus is not used anywhere else in the program. What happens when this program runs?

```
01  procedure setBonus()
02      bonus = 50
03  endprocedure
04  setBonus()
05  print(bonus)
```

A 50 is output, because setBonus has already run
B An error at line 05, because bonus only exists inside setBonus
C 0 is output, because bonus has not been given a value
D The word bonus is output, because it has no quotation marks

23 The 2D array climbs stores climbs[wall, day]. Walls are numbered 0 to 2 and days 0 to 4. Which accesses wall 2 on day 4?

A `climbs[4, 2]`
B `climbs[1, 3]`
C `climbs[2, 4]`
D `climbs[3, 5]`

24 This code should add a line to the end of log.txt. Which line must be added after line 02?

```
01  myFile = open("log.txt")
02  myFile.writeLine("Done")
```

A `myFile.close()`
B `myFile.endOfFile()`
C `newFile("log.txt")`
D `myFile.readLine()`

25 The table TblMember has the fields MemberID, Name and Town. Which query returns the names of members who live in Leeds?

A `SELECT Name FROM TblMembers WHERE Town = "Leeds"`
B `SELECT Town FROM TblMember WHERE Name = "Leeds"`
C `SELECT Name WHERE Town = "Leeds" FROM TblMember`
D `SELECT Name FROM TblMember WHERE Town = "Leeds"`

26 What does the WHERE clause do in this query?

```
SELECT * FROM TblMember WHERE MemberID > 3
```

A It chooses which fields are returned
B It sorts the records into order
C It chooses which records are returned
D It names the table to search

27 An age must be from 11 to 18. Which line keeps asking while the age entered is invalid?

A `while age < 11 and age > 18`
B `while age < 11 or age > 18`
C `while age >= 11 and age <= 18`
D `while age < 11 or > 18`

28 Marks from 40 to 80 inclusive are valid. The check used is: if mark > 40 and mark < 80 then. Which test value would show that the check is wrong?

A 60
B 40
C 81
D 0

29 A program accepts whole numbers from 1 to 10. How should the test values "seven" and 15 be classified?

A "seven" is invalid; 15 is erroneous
B "seven" is erroneous; 15 is boundary
C "seven" is invalid; 15 is normal
D "seven" is erroneous; 15 is invalid

30 A binary search can be carried out straight away on which of these lists?

A `[31, 20, 3, 12, 8]`
B `["cat", "ant", "dog"]`
C `[3, 8, 12, 20, 31]`
D Any list, as long as it has fewer than 10 items

31 The list [5, 2, 9, 1] is sorted into ascending order using a bubble sort. What is the list after the first pass?

A `[2, 5, 1, 9]`
B `[1, 2, 5, 9]`
C `[2, 1, 5, 9]`
D `[2, 5, 9, 1]`

32 In a merge sort, the lists [2, 7] and [3, 5] are merged. What is the result?

A `[2, 7, 3, 5]`
B `[2, 3, 7, 5]`
C `[7, 5, 3, 2]`
D `[2, 3, 5, 7]`

33 A = 0 and B = 1. What is the value of NOT (A OR B)?

A 1
B 2
C 0
D It cannot be worked out without a truth table

34 Which description matches the NOT gate symbol?

A A triangle with a small circle at its output, and one input
B A triangle with two inputs, like an AND gate
C A triangle with no circle, and one input
D A D shape with two inputs and a circle at its output

35 Which statement about a compiler is correct?

A It translates and runs the program one line at a time
B It stops at each error so you can fix it and carry on running
C It is only used to translate assembly language
D It translates the whole program and produces an executable file

36 Which is a reason a programmer might write part of a program in assembly language?

A Assembly language uses mnemonics, while high-level languages use English-like keywords
B Assembly language is a low-level language
C It gives direct control of the hardware, so the code can run quickly on that processor
D Assembly language is easier to read and debug

37 Which change would make this code easier to maintain?

```
01  x = 0
02  for y = 1 to 10
03      x = x + y
04  next y
05  print(x)
```

A Indent the code inside the loop
B Test it with boundary data
C Rename x to total and y to number
D Add validation to the input

38 You are completing a trace table. A line runs but produces no output. What should go in the Output column for that row?

A An x
B Nothing: leave the cell blank
C The word none
D The previous output again

39 A program lets students book seats on the school bus. Which of these is an example of abstraction in this program?

A Splitting the program into a booking part and a payment part
B Removing unnecessary detail to make a problem simpler
C Using a loop to count the bookings
D Ignoring the colour of the bus and storing only the number of seats

40 A program must find the highest score in an array while looping through it. What is the simplest approach?

A Copy the scores into a second array, sort it, then take the last item
B Keep one variable, highest, and replace it whenever a larger score is found
C Build a 2D array that stores every score alongside its position
D Compare every score with every other score in a nested loop

END OF QUESTIONS

Answer sheet

J277/02 Diagnostic Test. Circle ONE letter for each question. If you have no idea, leave the row blank.

Name _____

Class _____

Q	A	B	C	D
1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D
11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D
16	A	B	C	D
17	A	B	C	D
18	A	B	C	D
19	A	B	C	D
20	A	B	C	D

Q	A	B	C	D
21	A	B	C	D
22	A	B	C	D
23	A	B	C	D
24	A	B	C	D
25	A	B	C	D
26	A	B	C	D
27	A	B	C	D
28	A	B	C	D
29	A	B	C	D
30	A	B	C	D
31	A	B	C	D
32	A	B	C	D
33	A	B	C	D
34	A	B	C	D
35	A	B	C	D
36	A	B	C	D
37	A	B	C	D
38	A	B	C	D
39	A	B	C	D
40	A	B	C	D

Total: _____ **/ 40**