Chhetri Academy

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GCSE COMPUTER SCIENCE

2.2

OCR J277 | Specification point 2.2.3

Additional programming techniques

Untiered

Past paper question booklet

2	2018-2023	Untiered
question groups	available papers	tier

Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

4 A library gives each book a code made from the first three letters of the book title in upper case, followed by the last two digits of the year the book was published.

For example, “Poetry from the War”, published in 2012 would be given the code `POE12`.

(a) (i) Complete the following pseudocode for a function definition that will take in the book title and year as parameters and return the book code.

```
01 function librarycode(title, ……)
02     parta = title.subString(0, ……)
03     partb = year.subString(2, 2)
04     …… parta.upper + partb
05 endfunction
```

[3]

(ii) Use pseudocode to write an algorithm that does the following :

- Inputs the title and year of a book from the user.
- Uses the librarycode function above to work out the book code.
- Permanently stores the new book code to the text file `bookcodes.txt`

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…… **[6]**

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(b) Functions and procedures are both examples of sub programs.

(i) Describe **one** difference between a function and a procedure.

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..... **[2]**

(ii) Describe **two** benefits to a programmer of using sub programs.

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..... **[4]**

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Turn over

(c) The library sorts their books based on the book code.

(i) Show the steps that a merge sort would take to put the following list of book codes into ascending alphabetical order (from A to Z).

POE12 , BAC97 , FLY77 , JAV16 , TAL86 , AND18 , ZAR09 , HOP86

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..... **[4]**

(ii) Explain **one** advantage of a merge sort compared to a bubble sort.

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..... **[2]**

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1 **(a)** The table contains four statements about programming languages.

Tick (✓) **one** box in each row to identify whether each statement describes a low-level programming language or a high-level programming language.

Statement	Low-level	High-level
The same language can be used on computers that use different hardware		
It allows the user to directly manipulate memory		
It allows the user to write English-like words		
It always needs to be translated into object code or machine code		

[4]

(b) The variables `num1` and `num2` store integers.

Write pseudocode to add the integers stored in `num1` and `num2`. Store the result in a variable with the identifier `total`

.....

..... **[1]**

(c) Three incomplete pseudocode algorithms are given with a description of the purpose of each algorithm.

Write the missing arithmetic operator for each algorithm.

(i) Outputting 12 to the power of 2.

```
print(12 ..... 2)
```

[1]

(ii) Working out if a number is odd or even.

```
number = 53
if number ..... 2 == 0 then
   print("Even number")
else
   print("Odd number")
endif
```

[1]

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(iii) Finding the difference between two measurements.

```
measurement1 = 300

measurement2 = 100

difference = measurement1 ..... measurement2
```

[1]

(d) Read the following pseudocode algorithm:

```
01  start = 3
02  do
03    print(start)
04    start = start - 1
05  until start == -1
06  print("Finished")
```

Complete the following trace table for the given algorithm.

Line number	`start`	Output

[3]