2.2 Programming Fundamentals – Past Exam Questions

2.2.1 Programming fundamentals

- ☐ The use of variables, constants, operators, inputs, outputs and assignments
- ☐ The use of the three basic programming constructs used to control the flow of a program:
  - Sequence
  - Selection
  - Iteration (count- and condition-controlled loops)
- ☐ The common arithmetic operators
- ☐ The common Boolean operators AND, OR and NOT

Required

- ✓ Practical use of the techniques in a high-level language within the classroom
- ✓ Understanding of each technique
- ✓ Recognise and use the following operators:

Comparison operators		Arithmetic operators	
==	Equal to	+	Addition
!=	Not equal to	–	Subtraction
<	Less than	*	Multiplication
<=	Less than or equal to	/	Division
>	Greater than	MOD	Modulus
>=	Greater than or equal to	DIV	Quotient
		^	Exponentiation (to the power)

2.2.2 Data types

- ☐ The use of data types:
  - Integer
  - Real
  - Boolean
  - Character and string
  - Casting

Required

- ✓ Practical use of the data types in a high-level language within the classroom
- ✓ Ability to choose suitable data types for data in a given scenario
- ✓ Understand that data types may be temporarily changed through casting, and where this may be useful

2.2.3 Additional programming techniques

- ☐ The use of basic string manipulation
- ☐ The use of basic file handling operations:
  - Open
  - Read
  - Write
  - Close
- ☐ The use of records to store data
- ☐ The use of SQL to search for data
- ☐ The use of arrays (or equivalent) when solving problems, including both one-dimensional (1D) and two-dimensional arrays (2D)
- ☐ How to use sub programs (functions and procedures) to produce structured code
- ☐ Random number generation

Required

- ✓ Practical use of the additional programming techniques in a high-level language within the classroom
- ✓ Ability to manipulate strings, including:
  - Concatenation
  - Slicing
- ✓ Arrays as fixed length or static structures
- ✓ Use of 2D arrays to emulate database tables of a collection of fields, and records
- ✓ The use of functions
- ✓ The use of procedures
- ✓ Where to use functions and procedures effectively
- ✓ The use of the following within functions and procedures:
  - local variables/constants
  - global variables/constants
  - arrays (passing and returning)
- ✓ SQL commands:
  - SELECT
  - FROM
  - WHERE
- ✓ Be able to create and use random numbers in a program

2022

1 **(a)** Tick (✓) **one** box in each row to identify whether the OCR Reference Language code given is an example of selection or iteration.

OCR Reference Language code	Selection	Iteration

`for i = 1 to 10`
`  print(i)`
`next i`		

`while score != 0`
`  playgame()`
`endwhile`		

`if playerHit() then`
`  score = 0`
`endif`		

`switch bonus:`
`  case 0:`
`  score = 9`
`  case 1:`
`  score = 7`
`  case 2:`
`  score = 5`
`endswitch`		

[4]

(b) Write pseudocode to increment the value held in the variable `score` by one.

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

(d) Each member of staff that works in the restaurant is given a Staff ID. This is calculated using the following algorithm.

```
01  surname = input("Enter surname")
02  year = input("Enter starting year")
03  staffID = surname + str(year)
04  while staffID.length < 10
05      staffID = staffID + "x"
06  endwhile
07  print("ID " + staffID)
```

(i) Define the term **casting and** give the line number where casting has been used in the algorithm.

Definition .....

.....

Line number .....

[2]

(i) State the purpose of each of the arithmetic operators in the table.

Arithmetic operator	Purpose
*	
/	

[2]

5 Customers at a hotel can stay between 1 and 5 (inclusive) nights and can choose between a basic room or a premium room.

(a) A typical booking record is shown in the table:

`firstName`	Amaya
`surname`	Taylor-Ling
`nights`	3
`room`	Premium
`stayComplete`	False

(i) State the most appropriate data type for the following fields:

Nights .....

Room .....

[2]

(ii) Give the name of **one** field that could be stored as a Boolean data type.

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

(iii) Booking records are stored in a database table called `TblBookings`.

The following SQL statement is written to display all customer bookings that stay more than one night.

```
SELECT ALL
FROM TblBookings
IF Nights < 1
```

The SQL statement is incorrect.

Rewrite the SQL statement so that it is correct.

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

(c) A Basic room costs £60 each night. A Premium room costs £80 each night.

(i) Create a function, `newPrice()`, that takes the number of nights and the type of room as parameters, calculates and returns the price to pay.

You do **not** have to validate these parameters.

You must use **either**:

- OCR Exam Reference Language, **or**
- a high-level programming language that you have studied.

4 marks

(ii) Write program code, that uses `newPrice()`, to output the price of staying in a Premium room for 5 nights.

You must use **either**:
- OCR Exam Reference Language, **or**
- a high-level programming language that you have studied.

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..... **[3]**

(d) The hotel has nine rooms that are numbered from room 0 to room 8.

The number of people currently staying in each room is stored in an array with the identifier `room`.

The index of `room` represents the room number.

Array `room`

Index	0	1	2	3	4	5	6	7	8
Data	2	1	3	2	1	0	0	4	1

The following program counts how many people are currently staying in the hotel.

```
for count = 1 to 8
    total = 0
    total = total + room[count]
next count
print(total)
```

When tested, the program is found to contain **two** logic errors.

Describe how the program can be refined to remove these logic errors.

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

Sample Paper

3 The database table `Results` stores the results for each student in each of their chosen subjects.

StudentName	Subject	Grade
Alistair	English	3
Jaxon	Art	5
Alex	Art	4
Anna	French	7
Ismaael	Art	9

Complete the SQL query to return all of the fields for the students who take Art.

```
SELECT .....
FROM   .....
WHERE  .....
```

[3]

7 The area of a circle is calculated using the formula $\pi \times r^2$ where π is equal to 3.142 and r is the radius.

A program is written to allow a user to enter the radius of a circle as a whole number between 1 and 30, then calculate and output the area of the circle.

```
01  radius = 0
02  area = 0.0
03  radius = input("Enter radius")
04  if radius < 1 OR radius > 30 then
05  print("Sorry, that radius is invalid")
06  else
07  area = 3.142 * (radius ^ 2)
08  print (area)
09  endif
```

(b) Identify **two** variables used in the program.

1 .....

2 .....

[2]

(c) **(i)** Identify **one** item in the program that could have been written as a constant.

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

(ii) Give **one** reason why you have identified this item as a constant.

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

(d) Tick (✓) **one** box in each row to identify whether each programming construct has or has **not** been used in the program.

	Has been used	Has **not** been used
Sequence		
Selection		
Iteration		

[3]

8 A teacher researches the length of time students spend playing computer games each day.

(a) Tick (✓) **one** box to identify the data type you would choose to store the data and explain why this is a suitable data type.

Data Type	Tick (✓) one box
String	
Integer	
Real	
Boolean	

Explanation: .....

.....

[2]

(c) Data for one week (Monday to Friday) is stored in a 2D array with the identifier `minsPlayed`.

The following table shows part of this array, containing 4 students.

			Students			
			Stuart	**Wes**	**Victoria**	**Dan**
			0	**1**	**2**	**3**
Days of the week	**Mon**	**0**	60	30	45	0
	Tue	**1**	180	60	0	60
	Wed	**2**	200	30	0	20
	Thu	**3**	60	10	15	15
	Fri	**4**	100	35	30	45

The teacher wants to output the number of minutes Dan (column index 3) played computer games on Wednesday (row index 2). The following code is written:

```
print(minsPlayed[3,2])
```

Write a line of code to output the number of minutes that Stuart played computer games on Friday.

You must use **either:**

- OCR Exam Reference Language, **or**
- a high-level programming language that you have studied.

.....

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

(d) The teacher writes a program to add up and print out the total number of minutes student 2 played computer games over 5 days (Monday to Friday).

```
total = 0
total = total + minsPlayed[2,0]
total = total + minsPlayed[2,1]
total = total + minsPlayed[2,2]
total = total + minsPlayed[2,3]
total = total + minsPlayed[2,4]
print(total)
```

Refine the program to be more efficient. Write the refined version of the algorithm.

You must use **either:**

- OCR Exam Reference Language, **or**
- a high-level programming language that you have studied.

4 marks

(ii) A program is created to convert hours and minutes into a total number of minutes.

The teacher wants to create a sub program to perform the calculation.

The program has been started but is not complete.

Complete the design for the program.

```
hours = input("Please enter number of hours played")
minutes = input("Please enter number of minutes played")
finalTotal = ..........
print(finalTotal)

function ..........
         ..........
         ..........
         ..........
         ..........
endfunction
```

[4]

2021

3 Taylor is writing an algorithm to record the results of an experiment.

Taylor needs to be able to enter a numeric value which is added to a total which initially starts at 0.

Every time she enters a value, the total is output.

The algorithm repeats until the total is over 100.

(b) The input to the program could be an integer or real value.

(i) State what is meant by a real data type **and** give an example of this data type.

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

(ii) State what is meant by an integer data type **and** give an example of this data type.

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

4 A programmer declares the following variables.

```
first = "Computer Science"
second = "is great"
```

(a) State **one** difference between a variable and a constant.

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

(b) State the output from the following lines of program code.

(i) `print(first.length)`

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

(ii) `print(second.length DIV 3)`

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

(iii) `print(3 ^ 2)`

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

(c) Strings can be concatenated (joined together) using the + operator. For example, `print("Maths " + second)` will output `Maths is great`

Use string manipulation with the variables `first` and/or `second` to produce the following output.

(i) `great`

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

(ii) `Computer`

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

(iii) `Science is great`

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

6 OCRBlocks is a game played on a 5 × 5 grid. Players take it in turns to place blocks on the board. The board is stored as a two-dimensional (2D) array with the identifier `gamegrid`

Fig. 6.1 shows that players A and B have placed three blocks each so far.

	0	1	2	3	4
0	A			B	
1					
2		B			
3	A		B		
4			A		

Fig. 6.1

The function `checkblock()` checks whether a square on the board has been filled. When `checkblock(4,2)` is called, the value "A" is returned.

```
function checkblock(r,c)
    if gamegrid[r,c] == "A" or gamegrid[r,c] == "B" then
       outcome = gamegrid[r,c]
    else
       outcome = "FREE"
    endif
    return outcome
endfunction
```

(a) Give the returned value when the following statements are called.

Function call	Returned value
`checkblock(2,1)`	
`checkblock(3,0)`	
`checkblock(2,3)`	

[3]

(b) State **one** feature of `checkblock()` that shows that it is a function and not a procedure.

.....

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

(c) When `checkblock(-1,6)` is called, an error is produced.

(i) State why this function call will produce an error.

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

(d) Write an algorithm to allow player A to select a position for their next block on the game board.

The algorithm must:

- ask the player for the position of their block on the board
- use the `checkblock()` function to check if this position is free
- if the position is free, add the letter "A" to the position chosen in the `gamegrid` array
- if the position is not free, repeat the above steps until a free position is chosen.

6 marks

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2020

1 The following table contains several definitions of terms that are used in Computer Science.

Letter	Definition
A	Cleaning up data entered by removing non-standard characters
B	Hiding or removing irrelevant details from a problem to reduce complexity
C	Checking that the user is allowed to access the program
D	Breaking a complex problem down into smaller problems
E	Repeating elements of a program
F	Converting one data type to another, for example converting an integer to a real number

(a) Write the letter of the definition that matches each keyword in each space.

Decomposition .....

Abstraction .....

Input sanitisation .....

Casting .....

[4]

(b) (i) Write a pseudocode statement to assign the value `7.3` to a variable with the identifier `timer`

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

(ii) State the most appropriate data type for the variable `timer`.

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

(b) The algorithm for one section of the vending machine program is shown in pseudocode.

```
if money >= price then
    venditem()
    giveChange(money - price)
else
    print("Error - not enough money inserted")
endif
```

(i) Give the identifier of **one** variable used in the algorithm.

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

(ii) State how many parameters are passed into the `giveChange()` subroutine.

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

(e) The vending machine stores the quantity of items available in a database table called ITEMS. The current contents of ITEMS is shown:

ItemCode	ItemName	Stock
A1	Crisps, bacon flavour	6
A2	Crisps, salted	2
B1	Chocolate bar	12
C1	Apple pieces	18
C2	Raisins	7

Complete the following SQL statement to display the item code for all items that have fewer than 10 in stock.

SELECT .....

FROM .....

.....

[4]

(f) The vending machine can be in one of three states: on, off or suspended. A user can change the state of the vending machine by using the following algorithm.

```
newstate = input("Enter the new state : ")

switch newstate:

     case "on":

          statevalue = 1

     case "off":

          statevalue = 2

     case "suspended":

          statevalue = 3

     default:

          print("Invalid state")

endswitch
```

Rewrite the algorithm to perform the same actions using IF statements in place of the switch statement.

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..... **[5]**

(d) `DIV` and `MOD` are both operators used in computing-related mathematics.

(i) State the value of `13 DIV 4`

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

(ii) State the value of `13 MOD 4`

.....

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

(c) A school uses the array to call an attendance register every morning.

Write an algorithm using iteration to:

- display the name of each student one at a time from `studentnames`
- take as input whether that student is present or absent
- display the total number of present students and number of absent students in a suitable message, after all student names have been displayed.

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6 marks

2019

The number of goals scored in each football match is held in an array called `goals`. An example of this array is shown.

```
goals = [0, 1, 3, 0, 4, 5, 2, 0, 2, 1]
```

Elliott wants to count how many matches end with 0 goals.

(c) Complete the following pseudocode for an algorithm to count up how many matches with 0 goals are stored in the array and then print out this value.

```
01 nogoalscount = 0
02 for count = 0 to (goals.length-1)
03     if goals[.....] == 0 then
04         nogoalscount .....
05     endif
06 next count
07 print(.....)
```

[3]

(c) The symbol ^ is used for exponentiation.

Give the result of `a^b` when `a = 3` and `b = 2`.

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

6 OCR Land is a theme park aimed at children and adults. Entrance tickets are sold online. An adult ticket to OCR Land costs £19.99, with a child ticket costing £8.99. A booking fee of £2.50 is added to all orders.

(a) A function, `ticketprice()`, takes the number of adult tickets and the number of child tickets as parameters. It calculates and returns the total price to be paid.

(i) Use pseudocode to create an algorithm for the function `ticketprice()`.

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6 marks

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(ii) Tick (✓) **one** box to identify the data type of the value returned from the function `ticketprice()`, justifying your choice.

Data type of returned value	Tick (✓) **one** box
Integer	
Real	
Boolean	
String	

Justification .....

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[2]

2018

1 OCR High School uses a computer system to store data about students' conduct. The system records good conduct as a positive number and poor conduct as a negative number. A TRUE or FALSE value is also used to record whether or not a letter has been sent home about each incident.

An example of the data held in this system is shown below in Fig. 1:

StudentName	Detail	Points	LetterSent
Kirstie	Homework forgotten	−2	FALSE
Byron	Good effort in class	1	TRUE
Grahame	100% in a test	2	FALSE
Marian	Bullying	−3	TRUE

Fig. 1

(a) State the most appropriate data type used to store each of the following items of data.

- StudentName .....
- Points .....
- LetterSent .....

[3]

(b) The data shown above in Fig. 1 is stored in a database table called **Conduct**.

(i) Write an SQL statement to select the StudentName field for all records that have negative Points.

.....

.....

..... **[3]**

(ii) State the wildcard that can be used in SQL to show all fields from a table.

.....

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

(c) A single record from this database table is read into a program that uses an array with the identifier `studentdata`. An example of this array is shown below:

```
studentdata = ["Kirstie", "Homework forgotten", "-2", "FALSE"]
```

The array is zero based, so `studentdata[0]` holds the value "Kirstie".

Write an algorithm that will identify whether the data in the `studentdata` array shows that a letter has been sent home or not for the student. The algorithm should then output either "sent" (if a letter has been sent) or "not sent" (if a letter has not been sent).

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

2 A programmer has written an algorithm to output a series of numbers. The algorithm is shown below:

```
01 for k = 1 to 3
02     for p = 1 to 5
03         print (k + p)
04     next p
05 next k
06 m = 7
07 print m * m
```

(a) (i) Give the first **three** numbers that will be printed by this algorithm.

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

(ii) State how many times line **03** will be executed if the algorithm runs through once.

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

(b) Identify **two** basic programming constructs that have been used in this algorithm.

1 .....

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2 .....

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

(c) (i) Describe what is meant by a variable.

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

(ii) Identify **two** variables that have been used in the algorithm above.

1 .....

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

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]**

(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]**

6 An infinite loop is where a section of a program repeats indefinitely.

(a) For each of the pseudocode algorithms shown below, tick the appropriate box to show whether they will loop infinitely or not.

Pseudocode	Will loop infinitely	Will <u>not</u> loop infinitely

`01 x = 0`
`02 while True`
`03  print x`
`04 endwhile`		

`01 x = 0`
`02 while x < 10`
`03  print x`
`04 endwhile`		

`01 x = 0`
`02 while x < 10`
`03  print x`
`04  x = x + 1`
`05 endwhile`		

`01 y = 5`
`02 for x = 1 to y`
`03  print x`
`04 next`		

[4]

(b) Using pseudocode, write an algorithm that will use a count-controlled loop to print out the numbers 1 to 10 in ascending order.

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..... **[3]**

7 Victoria is writing a program using a high level language to display the meaning of computer science acronyms that are entered. The code for her first attempt at this program is shown below.

```
01  a = input("Enter an acronym")
02  if a == "LAN" then
03        print("Local Area Network")
04  elseif a == "WAN" then
05        print("Wide Area Network")
06  .....
07  .....
08  endif
```

(a) (i) Complete the code above to print out an "unknown" message if any other acronym is entered by the user. **[2]**

2017

3 An algorithm is written that finds the mean average (i.e. the total of the numbers divided by how many numbers there are) of a set of 10 numbers stored in an array `NumberArray`.

```
const Quantity = 10
for Count = 0 to Quantity
    Total = Total + NumberArray(.....................)
next Count
Mean = ..........................................
output Mean
```

(a) Complete the algorithm by adding the missing pseudocode statements. **[2]**

(b) Define the term constant, giving an example from the algorithm.

Definition .....

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.....

.....

Example.....

[3]

(c) Identify the most appropriate data type for `Mean`. Justify your choice.

Data type .....

Justification .....

.....

[2]

(d) The algorithm uses iteration.

(i) Describe what is meant by iteration.

.....

.....

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

(ii) Identify **two** forms of iteration that are **not** used in this algorithm.

1 .....

2 .....

[2]

2016

4 Joseph is an author and programmer, and he needs to estimate how many pages his new book will have.

Each page has an average of 300 words. Each chapter starts with a chapter title page.
The number of pages is estimated by;

- dividing the number of words by 300
- ignoring the decimal part of the division
- adding the number of chapters to this total.

Joseph uses the algorithm below to estimate the number of pages, but his algorithm does not give the correct result.

```
01  INPUT numberOfWords
02  INPUT numberOfChapters
03  CONST wordsPerPage = 300
04  numberOfPages = RoundDown(numberOfWords / wordsPerPage)
05  numberOfPages = numberOfWords + numberOfChapters
06  OUTPUT numberOfPages
```

Joseph has used a `RoundDown` function to remove the decimal part of the division, e.g. `RoundDown(6.2)` would return 6, `RoundDown(7.8)` would return 7.

(a) State whether this algorithm uses selection, sequence or iteration.

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

(b) Line 03 defines a constant. Describe what is meant by a constant.

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

(c) There is an error in line `05` of the algorithm.

Write a corrected line of code to replace line `05`.

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

(d) Identify the most appropriate data type for the following variable `numberOfWords`. Give a reason for your choice.

Data type .....

Reason .....

[2]

(e) Joseph is changing his algorithm and needs to store the name and price of his book in new variables. State the most appropriate data type(s) for these variables.

Name .....

Price .....

[2]

9 A memory game is played where:

- three players (A, B and C) have to choose a number between 0 and 100
- if the number has already been chosen, a message is displayed that says `"taken"`
- if the number has not already been chosen, the player's letter is placed next to it
- the quantity of numbers that have not yet been chosen is displayed.

The winner is the player who has chosen the most unique numbers by the end of the game.

The numbers are stored in an array; `numbers()`. A number that has not yet been chosen is stored as an empty string `""`. The players are represented by `"A"`, `"B"` and `"C"`.

Fig. 5 shows an extract from the array:

Number:	0	1	2	3	4	...	...	99	100
Player:	A	C	B		A			B	

Fig. 5

You have been asked to program part of the game.

Write an algorithm for player A's turn, which;

- takes as an input the number that player A chooses
- if it has not already been chosen, stores an `"A"` in that array element
- if it has already been chosen, outputs `"taken"`
- counts and outputs the quantity of numbers left that have not been chosen. **[6]**

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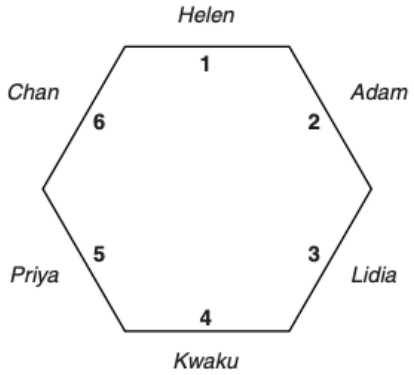
2015

10 A game on a computer shows six players around a table on seats. They are numbered 1 to 6 as shown below.



The names of the players are stored in an array with six elements called PlayerName. The index position of the array is used to indicate the seat number.
For example, the value of PlayerName(1) is "Helen".

(a) State the value of PlayerName(3).

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

(b) Describe what will happen if the code for the game includes an instruction to print the value of PlayerName(7).

.....

.....

.....

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

(c) During the game, each player sometimes moves clockwise by a given number of places.

For example, if the number of places is 2, Helen will move to seat 3, Priya will move to seat 1 etc.

Write an algorithm that will update the contents of the array PlayerName after a move has occurred. Your algorithm should:

- allow the number of places to move to be input
- use iteration
- ensure that all of the existing players' names are moved to the correct position in the array.

.....

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.....

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.....

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6 marks

.....

.....

.....

Some extra questions

Some of the Structured Query Language (SQL) for this database is

```
SELECT Surname, Title, PhoneNo
FROM CUSTOMER
WHERE Town = "Coventry"
[redacted]
```

Describe the purpose of this code and give **one** situation in which it may be used.

---

[5]

(i) Define the term parameter.

---[2]

```
01    FUNCTION IsEvil(n : INTEGER)
02      Temp = TRUE
03      WHILE (n > 0)
04        IF (n MOD 2) = 1 THEN
05          Temp = NOT(Temp)
06          n = n - 1
07        END IF
08        n = n DIV 2
09      END WHILE
10      RETURN Temp
11    END FUNCTION
```

Describe how iteration has been used in this function.

---[2]

(i) Describe the use of local variables.

---[4]

(ii) State **two** features of global variables that distinguish them from local variables.

1

2

---

[2]

13(a). A procedure takes as input a number between 1 and 100. It calculates and outputs the square of each number starting from 1, to the number input. The square of a number is the result of multiplying a number by itself.

```
procedure squares()
    do
        number = int(input("Enter a number between 1 and 100"))
    until number >= 1 AND number <= 100

    for x = 1 to number
        print(x * x)
    next x
endprocedure
```

The procedure uses one programming construct twice.

State whether the construct that is used twice, is iteration or branching.

---[1]

(b). State why the algorithm is a procedure and not a function.

---[1]

8. Programming languages consist of three basic programming constructs. For each construct, state its name and give a working example.

Construct 1: _____

Example: _____

Construct 2: _____

Example: _____

Construct 3: _____

Example: _____

---[6]

18. Describe **one** difference between a global and a local variable.

---[2]

Describe what is meant by a function.

---[2]

20. Dexter is leading a programming team who are creating a computer program that will simulate an accident and emergency room to train hospital staff.

Dexter's team is using an integrated development environment (IDE).

Describe how the programmers could make use of the following IDE tools:

Breakpoints _____

_____

_____

_____

Stepping _____

_____

_____

_____

[4]