

**1(a).** Give **two** reasons why some programs are written in a low-level language.

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[2]

**(b).** Describe the benefits of using a compiler instead of an interpreter when writing a program.

[3]

**2(a).** OCR Drones flies goods around the country using drones.

A text file is used to store pilot's codes and date of birth.

The text file is named `pilots.txt`. The contents of some of this file is shown:

```
JP670,17/05/1986
CC200,31/06/1980
SM720,01/04/1976
GC730,06/06/1978
```

Design an algorithm to:

- Ask the user to input a pilot code and a date of birth
- Write these inputs to the `pilots.txt` text file

**(b).** A pilot is allowed to fly a maximum of 9 hours per day. The pilot code and the hours flown for each flight in one day are stored in a 2D array of strings with the identifier `journeys`.

	[0]	[1]
[0]	"SM720"	"4.5"
[1]	"GC730"	"3"
[2]	"JP670"	"2"
[3]	"GC730"	"3.5"
[4]	"CC200"	"9"
[5]	"RY320"	"12"

Create a function, `pilotValid()`, that:

- You must use either:

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

[illegible]

**[6]**

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[4]

**(b).** The IDE includes a translator, such as a compiler or an interpreter.

Tick (✓) **one** box in each row to identify whether each statement describes the use of a compiler, an interpreter, or both.

Statement	Compiler	Interpreter	Both
Translates high-level code to low-level instructions.			
Produces an executable file.			
Program needs to be translated every time it is run.			

**[3]**

**4.** OCR Drones flies goods around the country using drones.

Pilots are paid a set amount each day. Pilots also get an additional payment for each mile they have flown that day. These payments are shown in the table.

Flying experience	Pay per day	Pay per mile
Fewer than 2 years	£120.00	£0.45
2 years to 5 years inclusive	£150.00	£0.65
More than 5 years	£180.00	£0.85

For example, a pilot with 3 years' experience who flies 100 miles in one day will receive a total of £215.00 pay. This is calculated in the following way:

- £150.00 pay for the day
- £65.00 additional payment (£0.65 pay per mile x 100 miles)
- Add £150.00 and £65.00 together to get £215.00 total pay

i. Complete the algorithm to:

- Calculate the total pay for the pilot for that day

You must use either:

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

```
experience = input("Enter years of experience")  
  
miles = input("Enter miles flown")  
  
totalPay = 0
```

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```
print(totalPay)
```

**[4]**

- ii. The programmer decides to make a function to calculate the total pay for the pilot.  
The function is called `calculatePay()`.

The function takes the values for `experience` and `miles` as two parameters and returns the total pay for the pilot.

Refine the algorithm to use this function and output the pay for the pilot.

You must use either:

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

```
experience = input("Enter years of experience")  
  
miles = input("Enter miles flown")  
  
..... = calculatePay( ..... , .....)  
  
print( totalPay )
```

**[2]**

5. 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]

6. Jack's program uses the addition ( + ) arithmetic operator. This adds together two numbers.

- i. State the purpose of each of the arithmetic operators in the table.

Arithmetic operator	Purpose
*	
/	

[2]

- ii. Complete the description of programming languages and translators by writing the correct term from the box in each space.

continues	crashes	debugging	error	executable
high-level	interpreter	language	low-level	many
no	one	stops	with	without

Jack writes his program in a ..... language. This needs to be translated into assembly or machine code before it can be executed. This is done using a translator.

One type of translator is an interpreter. This converts one line of code and then executes it, before moving to the next line. It ..... when an error is found, and when corrected continues running from the same position. This translator is helpful when debugging code.

A second type of translator is a compiler. This converts all of the code and produces an error report. The code will not run until there are ..... errors.

The ..... file produced can be run ..... the compiler.

**[5]**

**7(a).** A computer game is written in a high-level programming language.

State why the computer needs to translate the code before it is executed.

**[1]**

**(b).** Either a compiler or an interpreter can translate the code.

Describe **two** differences between how a compiler and an interpreter would translate the code.

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**[4]**

8(a).

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

Statement	High-level language	Low-level language
Uses English-like keywords such as <code>print</code> and <code>while</code>		
Must be translated before the processor can execute code		
Code written is portable between different processors		
Requires the programmer to understand the processor's registers and structure		

[4]

(b). A translator is a common tool found in an Integrated Development Environment (IDE).

Describe **two** other common tools or facilities that an IDE can provide.

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[4]



9. The area of a circle is calculated using the formula  $\pi \times r^2$  where  $\pi$  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
```

An Integrated Development Environment (IDE) is used to write the program.

Identify **two** features of an IDE that might be used when writing the program.

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2 \_\_\_\_\_

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[2]

END OF QUESTION PAPER