

1(a). State the most appropriate application software for each task in the table.

Task	Application Software
Creating graphics such as a logo	
Writing letters to clients to confirm their appointment date and time	
Calculating the company profits at the end of each month	
Storing, searching and updating client details and purchases	
Creating brochures and flyers about the organisation	

[5]

(b). OCR Solutions make use of software libraries when writing their programming code. They also make use of linkers and loaders to compile and run the program.

i. Describe what **linker** means.

[2]

ii. Describe what **loader** means.

[2]

2. All source code needs to be translated into object code using a translator.

A software development company has written a new computer game in a high-level language.

Identify which type of translator would be the most suitable for the computer game and give a reason why.

Type _____

Reason _____

-----[2]

3(a). A secondary school is upgrading their computers. They decide to install "thin client" computers. A thin client computer is when users access their computer in the usual way with a keyboard, mouse and monitor. However, all processing takes place on the virtual machine on a server rather than the computer at their desk.

The virtual machines will have utility software and application software installed.

- i. Describe the difference between utility software and application software.

-----[2]

- ii. The application software installed will be used by students to complete their school work.

Name **two** different types of application software that may be used by students, giving an example of how each may be used.

TYPE 1

Name _____

Example _____

TYPE 2

Name _____

Example _____
_____ [4]

- iii. The application software installed on the virtual machines can be closed source software or open source software.

Explain **one** advantage to the school of using open source software.

_____ [2]

- (b).** Name **three** different types of utility software.

1 _____

2 _____

3 _____

[3]

4. All source code needs to be translated into object code using a translator.

Tick **one** box in each row to indicate which type of translator is being used.

	Compiler	Interpreter	Assembler
Creates an executable file			
Creates one line of object code for each line of source code			
Translates all the high-level code at once			
A program needs to be translated each time it is run			

[4]

5. A small manufacturing business uses networked computers with closed source application software installed.

A spreadsheet application package is used to calculate employee's wages.

- i. Give **one** benefit of using a spreadsheet application for this task compared to calculating wages manually.

[1]

- ii. Give **two** other types of application packages that the small business could use, giving an example of a task that the business could use each application for.

Application 1 _____

Example of task 1 _____

Application 2 _____

Example of task 2 _____

[4]

- ii. Describe a drawback of using closed source software (rather than open source software) for the small business.

-----[3]

6(a). A programmer creates this function shown in **Fig. 5** using a high-level language.

```
function mystery(x,y)
    total = x + y
    while x >= 10 then
        x = x - 10
        y = y - 10
        total = total + x + y
    endwhile
    return total
endfunction
```

Fig. 5

Before the code in **Fig. 5** can be executed, a translator must be used.

- i. State the purpose of a translator.

-----[1]

- ii. Explain **two** differences between a compiler and an interpreter.

Difference 1

Difference 2 _____

[4]

(b). For each statement shown in **Table 5**, tick (✓) **one** box in each row to indicate which stage of compilation each action takes place at.

	Lexical analysis	Syntax analysis	Code generation
Comments and whitespace are removed			
Keywords are replaced with tokens			
Object code is created			
Symbol table created for variables			
Builds an abstract syntax tree			

Table 5

[5]

(c). Describe the purpose of code optimisation.

[2]

7(a). Charlie owns a veterinary surgery in her local town. She has purchased a new computer for her business so she can complete her accounts, write letters to her customers and keep a record of her customers’ personal and appointment details.

She intends to install application software and utility software.

Charlie will install database application software on her computer.

State **one** additional type of application software Charlie could install and give an example of what she might use it for.

[2]

(b). Charlie's computer has firewall utility software already installed.

Explain **two** other pieces of utility software that Charlie should install on her computer.

1

2

[4]

(c). * Charlie will use database management software to store customers' personal and appointment details. Charlie is considering both open source and closed source database software.

Compare the differences between open source software and closed source software and recommend which type of database software Charlie should use.

You should refer to the following in your answer:

- Cost
- Usability
- Extensibility
- Security
- Support available

[9]

8(a). The Little Man Computer (LMC) instruction set can be used to write programs using assembly language.

State the type of translator that is used to convert assembly language into machine readable code.

[1]

(b). Fig. 3 shows assembly code written using the LMC instruction set.

	INP
	STA X
	SUB Y
	BRP jump
	LDA X
	STA Z
	HLT
jump	LDA Y
	STA Z
	HLT
X	DAT 0
Y	DAT 5
Z	DAT 0

Fig. 3

i. Tick **one** box to indicate the programming construct that is **not** used in **Fig. 3**.

Sequence

☐

Selection

☐

Iteration

☐

[1]

- ii. When the program is run, 7 is input by the user.

State the value that will be in the memory location z when the program has run with this input.

----- [1]

- iii. Write an equivalent version of the LMC assembly code shown in **Fig. 3** for a procedural programming language.

You should write your code using pseudocode or program code.

----- [4]

9(a). Imogen installs a compiler for a high-level programming language onto her computer and makes use of an open source IDE (Integrated Development Environment).

- i. State what is meant by the term 'open source software'.

----- [2]

- ii. Give **one** benefit to Imogen of using an open source IDE rather than a closed source IDE.

----- [1]

(b). When Imogen creates programs in a high-level language, she makes use of libraries.

- i. Explain what is meant by a library, giving **one** example of when **one** may be used.

-----**[3]**

- ii. Describe **one** advantage of the use of library files to programmers.

-----**[2]**

- iii. Describe **one** disadvantage of the use of library files to programmers.

-----**[2]**

- iv. Explain how linkers are used during the compilation process.

-----**[3]**

END OF QUESTION PAPER