

System Software

Question 1

Bart plays computer games on his stand-alone games console. The games console has an operating system.

(a) Describe the tasks performed by the operating system to manage the main memory in the games console.

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(b) The computer games are written in a high-level language. Bart does not need a compiler or an interpreter to run the games he buys for his console. Explain why the games run without the need for a compiler or an interpreter.

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..... [2]

(c) When Bart is at work, he connects his work laptop to his employer's Local Area Network (LAN). The LAN has both a router and a gateway. Give two similarities and one difference between a router and a gateway.

Similarity 1

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Similarity 2

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Difference

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..... [3]

Question 2

- 9 Utility programs are examples of system software.
- (a) Complete the table by writing the name of the utility program for each description.

Description	Utility program
Reorganises files on a disk to improve efficiency	
Scans a hard disk to identify bad sectors	
Prepares a hard disk for first use	

[3]

Question 3

- (c) Amir’s computer has system software, including utility software and an operating system. (i)
Explain how the disk formatter, disk contents analysis and disk repair utilities work together.

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..... [3]

- (ii) Amir’s computer has several peripheral devices connected to it. State three peripheral management tasks performed by the operating system.

Task 1
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Task 2
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Task 3

..... [3]

Question 4

4 Annchi is writing a computer game with a group of friends. (a) One of her friends has suggested using Dynamic Link Library (DLL) files to help them develop the game. (i) Give three reasons why Annchi and her friends should use DLL files when developing the game.

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(ii) Give two reasons why Annchi and her friends should not use DLL files when developing the game.

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(b) Each member of the group is creating a different part of the game. Each person needs to test their part of the game independently before they are combined. Identify the most appropriate type of translator that should be used to test each part of the game independently. Justify your choice.

Translator

Justification

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..... [3]

Question 5

3 Kimmy has written a program in a high-level language. (a) Kimmy has used library routines in the program.

(i) Describe two advantages of using library routines in the program.

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- 2
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(ii) Describe what is meant by a Dynamic Link Library (DLL).

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(b) Three translators are compilers, interpreters, and assemblers.

(i) State one benefit of Kimmy using an interpreter during the development of the program.

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(ii) State three benefits of Kimmy using a compiler when the program is complete.

- 1
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- 2
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- 3
..... [3]

Question 6

A computer has an operating system (OS) and utility software.

(a) The following table lists key management tasks performed by an operating system and their descriptions.

Complete the table by writing the missing management task names and descriptions.

Management task	Description
Memory management	
	Provides user accounts and passwords
	Handles the signals sent when the attention of the processor is required elsewhere
Provision of a software platform	

[4]

(b) A hard disk formatter and a hard disk defragmenter are two examples of utility software.

(i) Describe the actions performed by a hard disk formatter and a hard disk defragmenter.

Hard disk formatter
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Hard disk defragmenter
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..... [4]

(ii) Identify three other examples of utility software that can be installed on the computer.

- 1
- 2
- 3 [3]

Question 7

(b) Aaron's computer has an operating system (OS). The OS manages the running processes and provides a user interface. Describe these OS management tasks.

Process management

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Provision of a user interface

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[6]

(c) Aaron's computer has a virus checker and backup software.

Describe these utility programs.

Virus checker

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Backup software
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..... [4]

(d) Aaron creates a web page using JavaScript code and HTML tags.

Describe how the JavaScript code is translated using an interpreter.
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..... [2]

Question 8

1 (a) The diagram shows different types of software on the left, and descriptions on the right.

Draw a line from each type of software to its correct description.

Type of software	Description
Operating system	Provides a ready-built routine that can be imported into a program
Utility program	Provides an interface between the user and the hardware
Library program	Converts source code into a low-level language
Compiler	Creates a new document for the user to edit
	An additional program that helps to maintain or configure the system

[4]

b) Describe the purpose of disk repair software.

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.....[3]

Question 9

2 Leonardo's mobile phone has an operating system (OS).

(a) Describe the following key management tasks that the mobile phone operating system carries out.

Process management

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Memory management

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..... [6]

Question 10

An operating system (OS) is usually pre-installed on a new computer.

(a) The OS performs a number of different tasks such as memory management and security management.

(i) State three memory management tasks the OS performs.

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2
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3 [3]

(ii) State three security management tasks the OS performs.

1
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3 [3]

(iii) State two tasks, other than memory management and security management that are carried out by an OS.

1
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2 [2]

(b) Utility software is usually pre-installed on a new computer.

The following table lists four programs. Put **one** tick (✓) in each row to indicate whether or not the program is utility software.

Program	True	False
Disk Defragmenter		
Word Processor		
Library Program		
Compression Software		

[4]

Question 11

An operating system (OS) is usually pre-installed on a new computer.

(a) The OS performs a number of different tasks such as file management and peripheral management.

(i) State three file management tasks the OS performs.

- 1
- 2
- 3 [3]

(ii) State three printer management tasks the OS performs.

- 1
- 2
- 3 [3]

(b) Utility software is usually pre-installed on a new computer.

(i) The following table lists four programs. Put **one** tick (✓) in each row to indicate whether or not the program is utility software.

Program	True	False
Database		
Virus checker		
Web browser		
Backup software		

[4]

(ii) Name **two** other utility programs.

- Program 1
- Program 2 [2]

Question 12

(b) Kim will use library routines in her program.

(i) Describe what is meant by a library routine.

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.....[2]

ii) Describe one benefit and one drawback of using library routines.

Benefit

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Drawback

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.....[4]

(c) Kim develops her program and makes it ready for use. To do this, she uses first an interpreter and then a compiler. Explain why Kim needs to use both an interpreter and a compiler.

Interpreter

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Compiler

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..... [4]

Question 13

Draw a line to link each OS management task to the appropriate user action.

OS management task	Action
Main memory management	The user moves the mouse on the desktop
Input/Output management	The user closes the spreadsheet program
Secondary storage management	The user selects the Save command to save their spreadsheet file
Human computer interface management	The user selects the Print command to output their spreadsheet document

[3]

(b) A user has the following issues with the use of his PC.

State the utility software which should provide a solution.

(i) The hard disk stores a large number of video files. The computer frequently runs out of storage space. Utility software solution[1]

(ii) The user is unable to find an important document. He thinks it was deleted in error some weeks ago. This must not happen again. Utility software solution[1]

(iii) The operating system reports 'Bad sector' errors. Utility software solution[1]

(iv) There have been some unexplained images and advertisements appearing on the screen. The user suspects it is malware. Utility software solution[1]

Question 14

(a) (i) Explain why a personal computer (PC) needs an operating system (OS).

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[2]

(ii) One of the tasks carried out by the OS is the management of the use of the processor.

Name and describe two other management tasks that the OS performs.

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 2

 [4]

(b) A user has the following issues with the use of their personal computer (PC).

For each case, state the utility software which should provide a solution.

(i) The user wants to send a large file as an attachment to an email. The user knows that the recipient's Internet Service Provider (ISP) has a limit of 2MB for file attachments. Utility software solution:[1]

(ii) The user is writing a book and is worried that the document files could get damaged or deleted. Utility software solution:[1]

(iii) The computer has recently been slow to load large files. The user has deleted a large number of small files to try to solve the problem. A friend has advised that there is a procedure which should be regularly carried out to reorganise file storage on the hard disk. Utility software solution:[1]

(iv) The user clicked on an attachment in an unsolicited email. Since then, the computer has shown some unexplained behaviours. Utility software solution:[1]

Question 15

2 (a) The diagram shows three items of software that translate program code.

Draw **one** line from each context to the correct item of translation software.

Context	Item of translation software
A web page contains a client-side script.	Assembler
Each instruction in the source code consists of an op code and an operand.	Interpreter
The source code is required at run-time.	Compiler
When the source code is translated, copies of the executable program can be distributed without the need for the source code.	

[4]

(b) The Java programming language is said to be machine or platform independent.

(i) Describe what is meant by machine independent.

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.....[1]

(ii) Describe how a Java source code program is translated.

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.....[2]

Question 16

Three examples of language translators and four definitions are shown below.

Draw lines to link each language translator to the correct one or more definitions.

Language translator

Compiler

Assembler

Interpreter

Definition

The software reads the source code and reports all errors. The software produces an executable file.

The software reads each statement and checks it before running it. The software halts when it encounters a syntax error.

The software translates a high-level language program into machine code for the processor to execute.

The software translates low-level statements into machine code for the processor to execute.

[3]

Question 17

1 Describe two differences between a compiler and interpreter.

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.....[4]

Question 18

(b) (i) Explain why a computer needs an operating system.

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(ii) Give two key management tasks carried out by an operating system.

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(c) New program code is to be written in a high-level language. The use of Dynamic Link Library (DLL) files is considered in the design.

Describe what is meant by a DLL file.

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.....[2]

Question 19

A small company produces scientific magazines. The owner buys some new desktop computers. The computers are used to store thousands of colour images (diagrams and photographs). All the computers have Internet access.

(a) Name three utility programs the company would use on all their computers. Describe what each program does.

1

Description

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2

Description

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3

Description

.....[6]

Question 20

One management task carried out by an operating system is to provide a user interface.

Describe two more of these management tasks.

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Question 21

A programmer is writing a program that includes code from a program library.

(a) Describe two benefits to the programmer of using one or more library routines.

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(b) The programmer decides to use a Dynamic Link Library (DLL) file.

(i) Describe two benefits of using DLL files.

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(ii) State one drawback of using DLL files.

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Question 22

- 2 Assemblers translate from assembly language to machine code. Some assemblers scan the assembly language program twice; these are referred to as two-pass assemblers.

The following table shows five activities performed by two-pass assemblers.

Write 1 or 2 to indicate whether the activity is carried out during the first pass or during the second pass.

Activity	First pass or second pass
any symbolic address is replaced by an absolute address	
any directives are acted upon	
any symbolic address is added to the symbolic address table	
data items are converted into their binary equivalent	
forward references are resolved	.

[5]

Question 23

- 11 A game program is written which can be either interpreted or compiled. The table below shows five statements about the use of interpreters and compilers.

Tick (✓) to show whether the statement refers to an interpreter or to a compiler.

Statement	Interpreter	Compiler
This translator creates an executable file		
When this translator encounters a syntax error, game execution halts		
The translator analyses and checks each line just before executing it		
This translator will produce faster execution of the game program		
Use of this translator makes it more difficult for the user to modify the code of the game		

[5]

Question 24

- (a) Describe the difference between a command line interface (CLI) and a graphical user interface (GUI).

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[2]

- (b) CLI and GUI interfaces have advantages to certain users. Describe which type of user would find each of the interfaces the most useful. Justify your choice.

CLI

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GUI

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[2]

Question 25

In 1994, an oil company introduced a new computer system. The new system was a computer control system to operate an oil refining process.

- (a) (i)** This computer system has now been in operation for twenty years.

What major issues with the system is the oil company likely to be faced with?

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- (ii)** Describe how the issues you identified in **part (a)(i)** can be overcome.

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Question 26

- (d)** The computer is running a single-user operating system.

Describe what this means.

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