

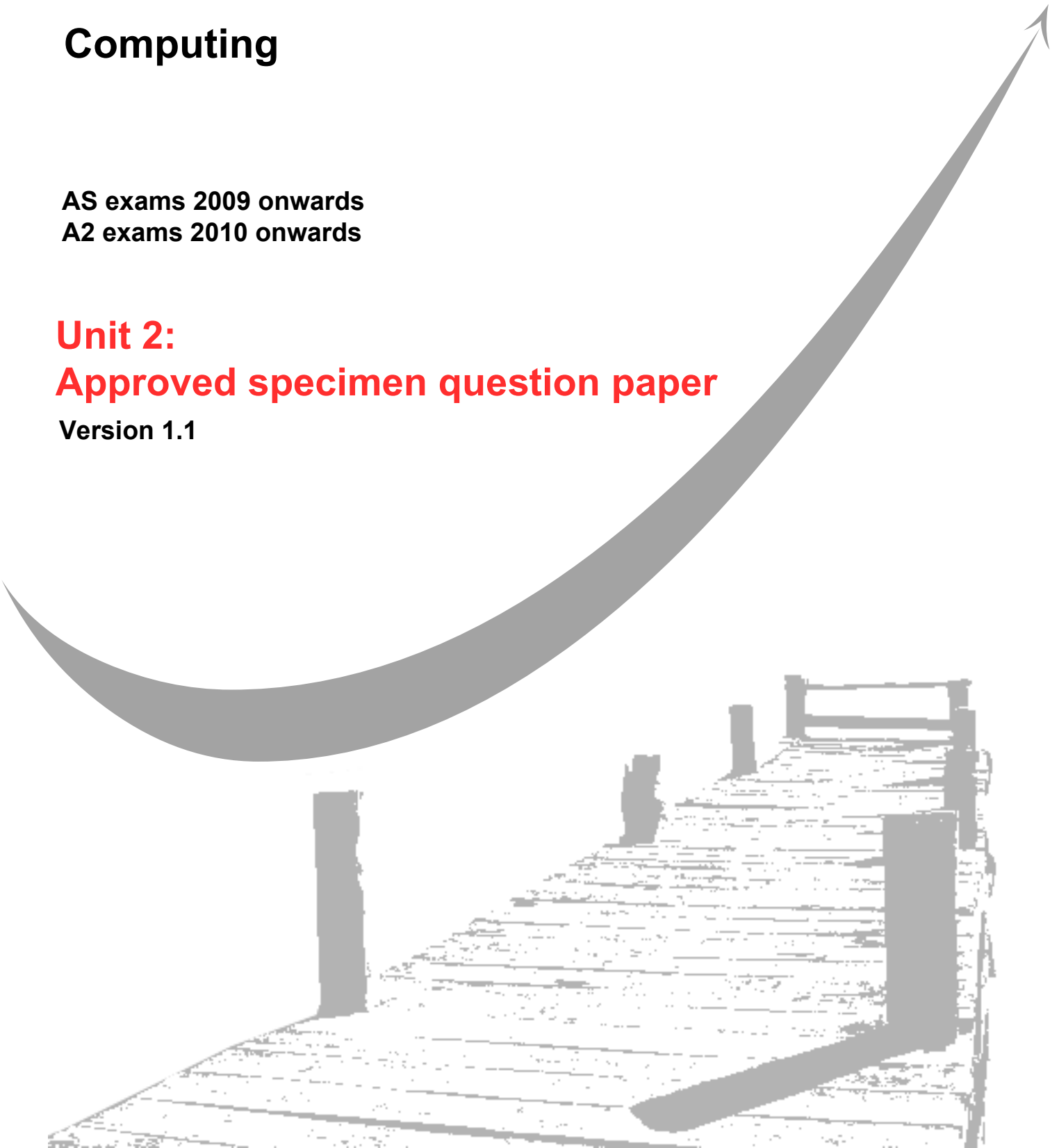
GCE
AS and A Level

Computing

AS exams 2009 onwards
A2 exams 2010 onwards

Unit 2:
Approved specimen question paper

Version 1.1



Surname					Other Names				
Centre Number					Candidate Number				
Candidate Signature									

Leave blank

General Certificate of Education
Advanced Subsidiary
Specimen Paper for 2009 and 2010



COMPUTING

COMP2 Computer Components, The Stored Program Concept and The Internet

Date Time

You will need no other materials.
You may use a calculator.

Time allowed: 1 hour

Instructions

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- All working must be shown.
- Do all rough work in this book. Cross through any work you do not want marked.

Information

- The maximum mark for this paper is 60.
- The marks for questions are shown in brackets.
- The use of brand names will **not** gain credit.
- The quality of written communication will be assessed in Questions 4, 9(b) and 11(b)(ii). In these questions you will be marked on your ability to use good English, to organise information clearly and to use specialist vocabulary where appropriate.

For Examiner's Use			
Number	Mark	Number	Mark
1		9	
2		10	
3		11	
4			
5			
6			
7			
8			
Total (Column 1)		→	
Total (Column 2)		→	
TOTAL			
Examiner's Initials			

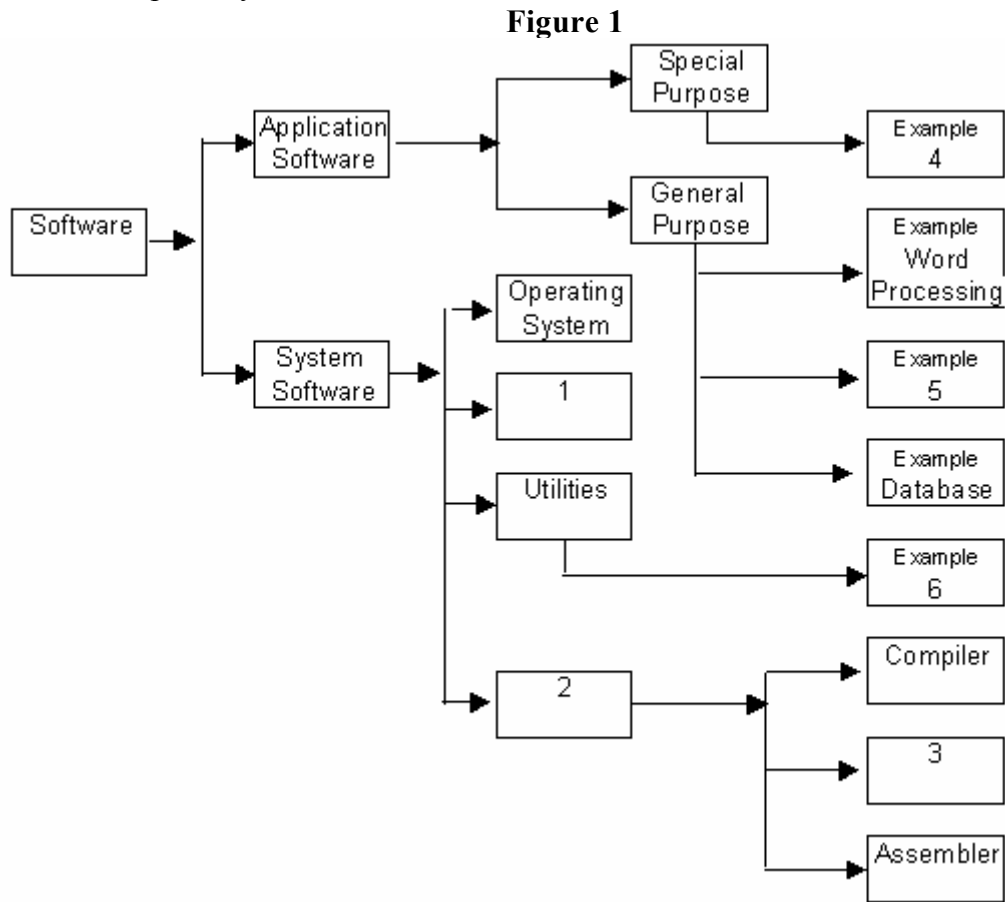
Answer **all** questions in the spaces provided.

1 (a) Define the term software.

.....

 (1 mark)

(b) The diagram in **Figure 1** shows the classification of various types of software used on a computer system.



Complete the labelling of **Figure 1** by suggesting labels for 1 to 6 in the diagram.
 Software category:

- 1.
- 2.
- 3.

Software example:

- 4.
- 5.
- 6.

(6 marks)

2 **Figure 2** and **Figure 3** below show two versions of the same program.

Figure 2

Move	#45,	RO
Move	#4,	R1
Move	#96,	R2
Add	R2,	R1
Add	R1,	RO

Figure 3

(c)		
100	00101000	00101101
101	00101001	00000100
102	00101010	01100000
103	10100001	00000000
104	10100000	00000000

(a) What generation of programming language is shown in **Figure 2**?

.....

(1 mark)

(b) What generation of programming language is shown in **Figure 3**?

.....

(1 mark)

(c) What would be a suitable heading for the column labelled (c) in **Figure 3**?

.....

(1 mark)

(d) What is the relationship between the program instructions shown in **Figure 2** and the program instructions in **Figure 3**?

.....

(1 mark)

3 Some of the components of a computer system are

Internal components

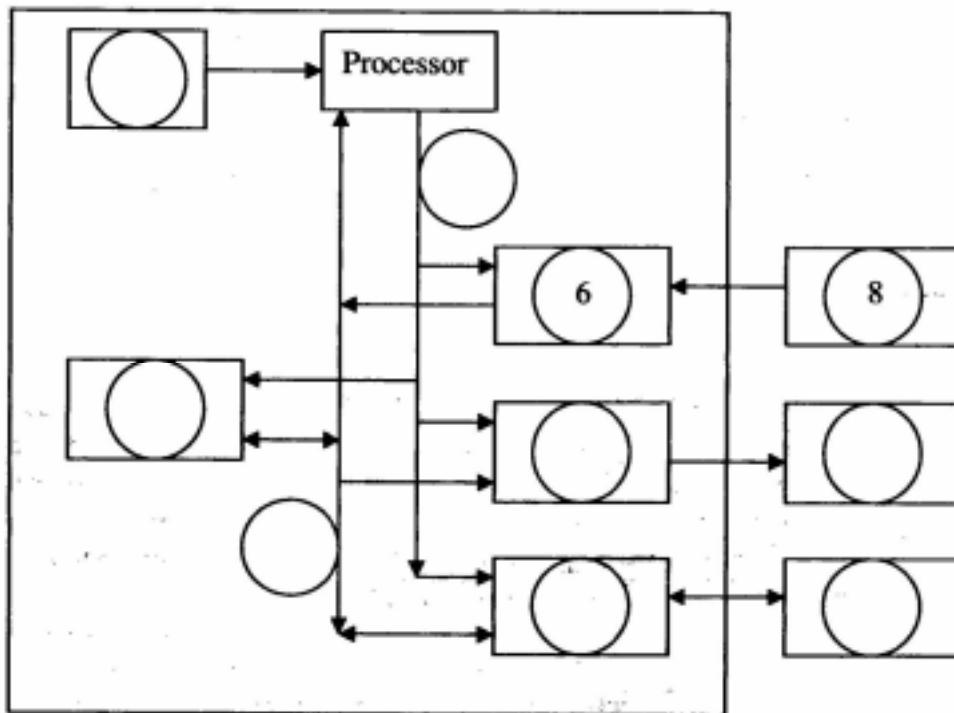
Clock	1
Data Bus	2
Address Bus	3
Main Memory	4
VDU Controller	5
Keyboard Controller	6
Disk Controller	7

Peripherals

Keyboard	8
Monitor	9
Secondary Storage	10

(a) **Figure 4** is partially filled in. Complete **Figure 4** by writing a number from the list above, in **each** empty circle.

Figure 4



(6 marks)

6

4 Describe how a laser printer produces printed results.

.....

.....

.....

.....

.....

.....

.....

(4 marks)

4

5 (a) A computer system has a clock speed of 3 GHz, a 32 bit data bus and a 24 bit address bus. What would be the precise effect of

(i) increasing the clock speed to 6 GHz?

.....
.....

(1 mark)

(ii) increasing the size of the data bus to 64 bits?

.....
.....

(1 mark)

(iii) increasing the width of the address bus to 40 bits?

.....
.....

(2 marks)

(b) The next instruction in an assembly language routine is
STO 1002

where STO is the mnemonic for Store Accumulator, and 1002 is the address of the memory location where the result of a calculation is to be stored.

In the Fetch Execute Cycle, instructions are fetched, decoded and executed. For each of the following three registers, state their role in the specified part of the cycle during the fetching, decoding and execution of this instruction.

Memory Data Register in the **fetch** part.

.....
.....

Current Instruction Register in the **decode** part.

.....
.....

Memory Address Register in the **execute** part.

.....
.....

(3 marks)

7

- 6 (a) The alarm in your kitchen will sound if it senses heat or smoke.

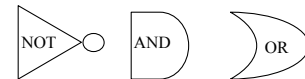
State which logic gate would be used to determine whether the alarm will go off, and draw up the relevant truth table. The outline of the truth table is done for you.

Logic Gate (1 mark)

Senses heat	Senses smoke	Alarm
0		
0		
1		
1		

(2 marks)

(b) Logic gates are represented in diagrams using these symbols:



- (i) Draw a logic diagram for the Boolean expression $A \cdot (\bar{A} + B)$

(3 marks)

- (ii) Simplify the expression using the laws and theorems of Boolean algebra.

(3 marks)

- (iii) Draw a logic diagram for the simplified expression.

(1 mark)

(iv) Based on parts (i) and (iii), explain why simplifying Boolean expressions is useful when designing circuits.

.....
.....

(1 mark)

11

7 Style sheets are increasingly being used, together with HTML, for designing and creating web pages. Give **three** benefits of using style sheets rather than using HTML tags to style and format a web page.

1.....
.....
2.....
.....
3.....
.....

(3 marks)

3

8 Imagine you have just started your first job as a software engineer. Before you can register to log into the firm’s computer system, you have to read, and acknowledge that you have read a page about adhering to current legislation relating to computer use and computerised data and programs.

Extracts from the web page are printed below. For each extract, state the legislation to which it refers.

(a) The writing of software that might be used for hacking, or the spreading of any malicious material such as viruses, Trojans, and spy ware will be cause for instant dismissal.

.....
(1 mark)

(b) The use of someone else’s program code in your own program must have prior permission of the original programmer and must be acknowledged.

.....
(1 mark)

(c) If writing software for an organisation that will involve the processing of personal data, you must ensure strict security routines are included.

.....
(1 mark)

(d) Current UK legislation allows employers to monitor certain types of communication made by staff, providing they inform staff of the nature and extent of such monitoring.

.....
(1 mark)

4

- 9 (a) The term given to techniques which attempt to safeguard the rights of producers of digital material such as computer software or music CDs is Digital Rights Management (DRM).

DRM uses encryption and authentication systems to curb piracy. Encryption is used to protect the digital material itself, making it unreadable to anyone without the appropriate decryption key.

Explain how authentication would be used to allow users who have paid for the digital material to read it successfully.

.....
.....
.....

(1 mark)

- (b) There is much debate about the use of DRM. State whether you are in favour or against DRM and describe 2 arguments to support your opinion.

.....
.....
.....
.....
.....

(2 marks)

- 10 An organisation wants to set up a website. They decided on a suitable domain name.

- (a) Why do they need to register this domain name with an Internet registry?

.....
.....

(1 mark)

- (b) The Domain Name Service allows the use of domain names instead of IP addresses to locate a website. Explain how the Domain Name service makes this possible.

.....
.....
.....
.....

(1 mark)

3

2

11 Using electronic e-mail over the Internet is an example of a **client–server system**.

(a) Explain the term client-server.

.....
.....
.....

(3 marks)

(b) The sending and receiving of e-mails uses various protocols.

(i) Explain the term **protocol**.

.....

(1 mark)

(ii) Bob is a student travelling in his gap year. His sister Alice e-mails a greeting to him on his birthday, not knowing where he will be on that date. Explain, including the main protocols involved, how Bob is able to pick up Alice’s message.

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.....
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(5 marks)

END OF QUESTIONS