



Oxford Cambridge and RSA

Tuesday 14 May 2024 – Afternoon

AS Level Computer Science

H046/01 Computing Principles

Time allowed: 1 hour 15 minutes



Do not use:

- a calculator



Please write clearly in black ink. Do not write in the barcodes.

Centre number

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Candidate number

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First name(s)

Last name

INSTRUCTIONS

- Use black ink.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- Answer **all** the questions.

INFORMATION

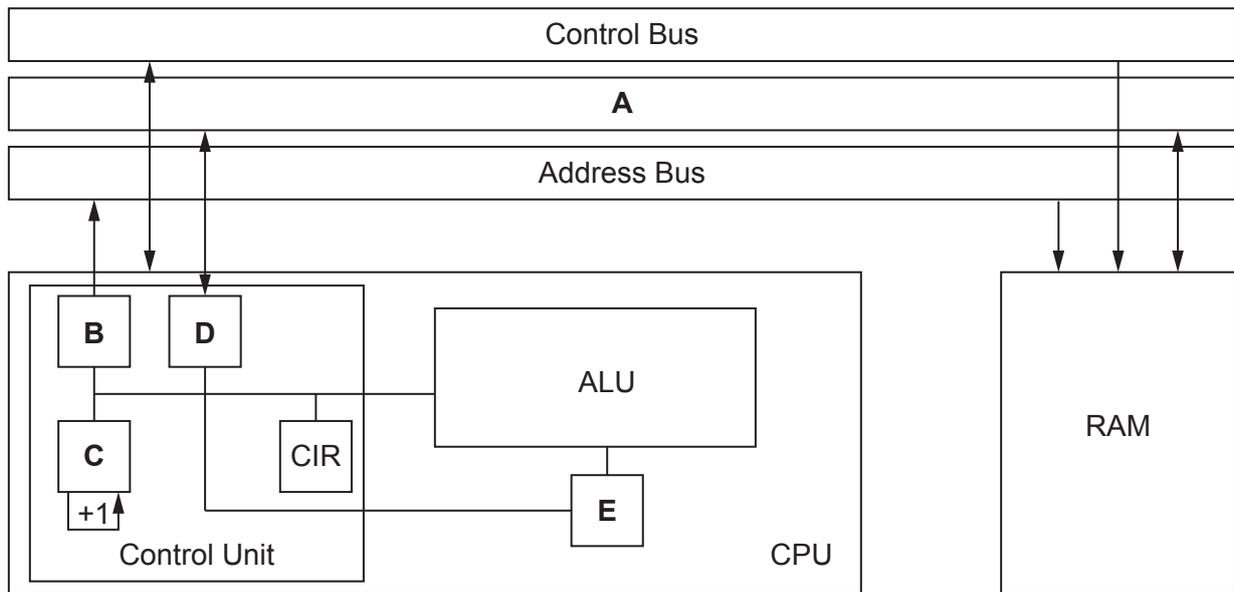
- The total mark for this paper is **70**.
- The marks for each question are shown in brackets [].
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has **16** pages.

ADVICE

- Read each question carefully before you start your answer.

Answer **all** the questions.

1 Here is a diagram of a computer system.



Identify each of the labelled components in this computer system.

A	
B	
C	
D	
E	

[5]

3 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.

(a)

(i) Describe **one** advantage of using virtual machines in this way.

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

(ii) Describe **one** disadvantage of using virtual machines in this way.

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

(b) Each virtual machine will run an operating system. One type of operating system is multi-user.

Describe **two** other types of operating system and give an example of where each may be used.

TYPE 1

Description

.....

.....

.....

Example

.....

TYPE 2

Description

.....

.....

.....

Example

.....

[6]

(c) 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]

(d) 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.

(a) 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]

(b) 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]

6

(a) Using the binary value 1001 1101, convert this into:

(i) A positive denary number.

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

(ii) A negative denary number using two's complement.

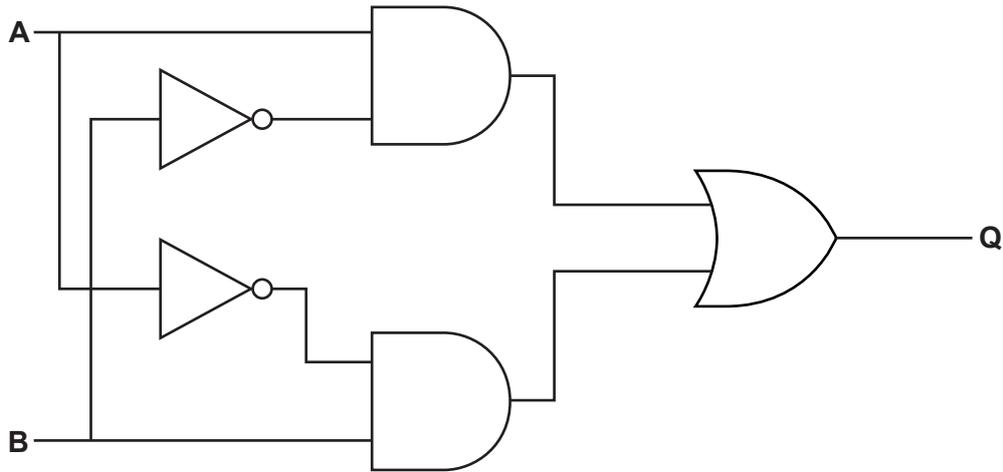
.....
..... [1]

(iii) A hexadecimal value.

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

7

(a) A logic gate diagram is shown below.



(i) Complete the truth table for this logic gate diagram.

A	B	Q
0	0	
0	1	
1	0	
1	1	

[2]

(ii) What single gate is this logic gate diagram equivalent to?

.....

..... [1]

15

(b) Draw the logic gate diagram for this expression:

$$Q = (A \vee \neg B) \wedge C$$



[3]

END OF QUESTION PAPER

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