



CAMBRIDGE
OCR

J277/01

GCSE (9–1) Computer Science

ComputerSystems

Wednesday 13 May 2026 – Afternoon

Transcription of the Braille Version
UEB Grade 2

J277/01

[braille page 1]

J277/01

CAMBRIDGE OCR

GCSE (9–1) Computer Science

Computer Systems

Wednesday 13 May 2026

Afternoon

Time allowed

1 hour 30 minutes plus your additional time allowance.

DONOT USE:

a calculator

[braille page 2]

INSTRUCTIONS

Write your centre number, candidate number, first name(s) and last name on your answer paper.

Write your answer to each question on your answer paper. The question numbers must be clearly shown.

Answer ALL the questions.

INFORMATION

The total mark for this paper is 80.

The number of print lines available and the marks for EACH question are shown in brackets, for example: (2 lines) [1 mark] – use this as a guide as to how much time to spend on each question.

Quality of extended response will be assessed in questions marked with an asterisk (*).

Please note: this paper contains facing pages.

[A contents page for this examination paper will be found as a separate booklet. This is to assist the candidate in locating selected books.]

[braille page 3]

ADVICE

Read each question carefully before you start your answer.

.....

[braille page 4]

1. Computers store data in binary.

(a) Identify the statement below that is FALSE.

Choose ONE answer from the given labelled (i) to (iv). [1 mark]

- (i) 1000 gigabytes is equivalent to 1 petabyte
- (ii) 1000 megabytes is equivalent to 1 gigabyte
- (iii) 2 nibbles is equivalent to 1 byte
- (iv) 1000 bytes is equivalent to 1 kilobyte

(b) Convert the binary number 11001010 into denary. (4 print lines)
[1 mark]

[Question 1 continues on the next page]

[braille page 5]

[Question 1 continued]

(c) (i) Convert the denary number 64 into hexadecimal. (4 lines)
[1 mark]

(ii) Give the smallest 1-digit hexadecimal value AND the largest 1-digit hexadecimal value.

Give your answer in the form:

Smallest _

Largest _

(1 line for each answer) [2 marks]

[Question 1 continues on the next page]

[braille page 6]

[Question 1 continued]

(d) Identify the binary shift that will multiply the binary value 00011001 by 4. (2 lines) [2 marks]

(e) State why computers represent data in binary. (2 lines) [1 mark]

(f) Complete the binary addition below. Show your working. [2 marks]

111000 1 0
+000011 1 1

[braille page 7]

2. A hospital has three separate buildings that are in different locations within a city. The hospital has a network with hundreds of computers that are located in the three buildings.

(a) The network is a WAN (Wide Area Network).
Explain the reasons why the network is a WAN and not a LAN (Local Area Network). (4 lines) [2 marks]

(b) One of the buildings has wired access to the network using Ethernet. Ethernet is an example of a standard.
State the purpose of a standard. (2 lines) [1 mark]

[Question 2 continues on the next page]

[braille page 8]

[Question2 continued]

(c)Someofthedatabeingtransferredover the network is confidential.

Explainhowencryptioncanbeusedtosecure the data from unauthorisedaccessduringtransmission.(6lines) [3 marks]

(d)Dataaboutthehospital,staffandpatients is stored centrally on a serverthatcanbeaccessedfrommanyauthorised device.

Describetheroleofaclientandtheserverwhen a doctor makes a request for patientdata froma computer.

Give youranswer in the form:

Client _

Server _

(4 lines for each answer) [4marks]

[Question2 continues onthenextpage]

[braille page 9]

[Question2 continued]

(e)TheWANallowsaccesstotheinternet.

Statethepurposeofeachprotocolusedover the internet labelled (i) to(iii)below. [3marks]

(i) POP(Post Office Protocol)

(ii) HTTP (Hypertext TransferProtocol)

(iii) IMAP(InternetMessageAccess Protocol)

[braille page 10]

3. A computer stores characters using a character set.

(a) Define the term character set. (2 lines) [1 mark]

(b) Part of the ASCII character set is given below:

Character	Denary value
A	65
B	66
C	67
D	68
a	97
b	98
c	99
d	100

Give the denary values that will be stored for the word 'Bed'. (1 line)
[2 marks]

[Question 3 continues on the next page]

[braille page 11]

[Question 3 continued]

(c) A document stores characters using 8-bits for each character.
The character set is changed to one that uses 16-bits for each character.

Give TWO effects of increasing the number of bits for each character.
(2 lines for each answer) [2 marks]

[braille page 12]

4. A computer has a Central Processing Unit (CPU).

(a) Refer to the incomplete description and function of the components within the CPU on page 13 and the list of terms on page 14.

Complete the missing items (i) to (vii) on page 13 using the terms on page 14. Not all terms are used [7 marks]

[Question 4(a) continues on the next page]

[braille page 13, facing page 14]

[Question 4 (a) continued]

The (i) performs the mathematical operations within the CPU, for example adding numbers together. The result of each calculation is stored in a register called the (ii).

The (iii) sends signals on each clock pulse. The signals are used to synchronise (iv) within the computer.

The clock sends a pulse a set number of times each second. This is known as the clock speed. A clock speed of 2GHz sends 2 (v) pulses each second. The (vi) the clock speed, the more fetch-execute cycles can be completed each second.

A computer can have multiple cores, for example a quad core processor has (vii) cores.

[Question 4 (a) continues on the facing page]

[braille page 14]

[Question 4 (a) continued]

Accumulator
Control Bus
Higher
Memory Data Register (MDR)
Program Counter (PC)
Arithmetic Logic Unit (ALU)
Control Unit (CU)
Inputs
Million
Thousand
Billion
Eight
Lower
Operations
Trillion
Cache
Four
Outputs
Two

[Question 4 continues on the next page]

[braille page 15]

[Question 4 continued]

(b) The computer has primary storage.

(i) Primary storage includes RAM and ROM.

Give TWO differences between RAM and ROM. (2 lines for each answer) [2 marks]

(ii) Complete the description below by writing down the missing word. [1 mark]

Data from RAM is moved to secondary storage when RAM is full. The data is moved back to RAM when it is needed by the CPU.

This memory is called _.

[Question 4 continues on the next page]

[braille page 16]

[Question 4 continued]

(c) The computer comes with utility software.

(i) Identify the purpose of utility software.

Choose ONE answer from the options A–D. [1 mark]

- A. To allow the user to perform useful tasks
- B. To increase the speed of the processor
- C. To perform housekeeping and maintenance tasks
- D. To start up the computer

(ii) Describe the purpose of defragmentation software in a computer. (4 lines) [2 marks]

[braille page 17]

5. A tablet computer has secondary storage.

(a) Give ONE reason why a computer needs secondary storage.
(2 lines) [1 mark]

(b) The tablet computer has a solid state secondary storage device.

(i) Describe TWO reasons why solid state storage is the most appropriate type of secondary storage for the tablet computer. (4 lines for each answer) [4 marks]

(ii) Identify TWO other types of secondary storage. (2 lines for each answer) [2 marks]

[braille page 18]

6. A student creates a bitmap image using a computer.

(a) The image file includes metadata. One item of metadata is the resolution.

Identify TWO OTHER items of metadata that could be included in the image file. (2 lines for each answer) [2 marks]

(b) The bitmap image is compressed.

(i) Give TWO reasons why an image file might be compressed. (2 lines for each answer) [2 marks]

(ii) Describe ONE advantage of compressing the image using lossless compression instead of lossy compression. (4 lines) [2 marks]

[Question 6 continues on the next page]

[braille page 19]

[Question 6 continued]

(c) The student stores the image on the cloud.

(i) State what is meant by the cloud. (2 lines) [1 mark]

(ii) Give ONE benefit of the student storing the image on the cloud. (2 lines) [1 mark]

[braille page 20]

7. Smart devices are found within homes.

(a) A smart speaker responds to spoken commands. The smart speaker records and analyses the sound it detects to identify the words spoken and match these to a command.

(i) Describe a privacy issue of smart speakers in homes.
(4 lines) [2 marks]

(ii) Describe a cultural issue of smart speakers in homes.
(4 lines) [2 marks]

(b) A smart light bulb allows the light bulb to be controlled remotely. The light can be turned on, turned off and the colour of the light can be changed.

Give TWO reasons why a smart light bulb can be considered an embedded system. (2 lines for each answer) [2 marks]

[braille page 21]

8.* A digital media company is setting up a new office network. The office has 10 fixedwired desktop computers and 10 tablet computers that connect to thenetwork wirelessly.

The companyneeds to choose between a star topology and a mesh topology.

Discuss the choice of topology for this network including:

- how star and mesh topologies work
- the benefits and drawbacks of star and mesh topologies
- a recommendation of which topology should be used with justification.

(35 lines) [8 marks]

[braille page 22]

9. A microphone is used to record a podcast on a computer.
The podcast is recorded with a sample rate of 44 000 Hz, a bit depth of 2-bytes and is 100 seconds long.

(a) Calculate an estimate of the file size of the podcast recording in KB. Show your working.

Give your answer in the form:

Working _

Answer _

(4 lines) [2 marks]

(b) The podcast is edited. The sample rate is changed to 10 000 Hz. The bit-depth is changed to 4 bits.

Describe TWO impacts of these changes on the recording and the file. (4 lines for each answer) [4 marks]

[braille page 23]

10. Write down the legislation that is being broken for each scenario given labelled A–D. [4 marks]

- A. A company that runs a social media site refuses to give a user the information they have stored about them and their online activities.
- B. A student guesses a teacher's password and logs on to their laptop.
- C. A teacher finds an old external hard disk drive that has personal data about ex-students.
- D. An individual creates a copy of their favourite music tracks and sells it to their friends.

.....
END OF QUESTION PAPER



Copyright Information

Cambridge OCR is committed to securing permission to reproduce all third-party content that it uses in its assessment materials. If Cambridge OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, Cambridge OCR will be happy to correct its mistake at the earliest possible opportunity. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the Cambridge OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

For queries or further information please contact The Cambridge OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

Cambridge OCR is part of Cambridge University Press & Assessment, which is itself a department of the University of Cambridge.

© Cambridge OCR 2026