GCE AS/A level

342/01

COMPUTING CP2
THE COMPUTER, DATA AND APPLICATIONS

A.M. FRIDAY, 16 May 2008

$1\frac{1}{2}$ hours

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	4	
2	2	
3	6	
4	4	
5	4	
6	8	
7	7	
8	9	
9	3	
10	3	
11	10	
Total	**60**	

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Answers should be written in the spaces provided. Where the space is not sufficient for your answer, continue the answer at the back of the book, taking care to number the continuation correctly.

The intended marks for questions or part questions are given in brackets [ ]. You are advised to divide your time accordingly. The total number of marks available is 60.

You are reminded of the necessity for good written communication and orderly presentation in your answers.

1. State, giving a reason in **each** case, the most suitable secondary storage medium for **each** of the following situations.

   (i)   Making a back up copy of a school's file server (200 Gigabytes). [2]

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   (ii) A school pupil submitting course work to an examination board that contains text, graphics and video (600 Megabytes). [2]

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2. *(a)* Files on the hard drive of a personal computer are stored in a **hierarchical** directory structure. Using a diagram, show how files might be organised in a typical **hierarchical** directory structure used on a personal computer. [1]

(b) Explain why this type of structure is used. [1]

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Turn over.
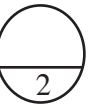
3. A firm of solicitors using a number of stand-alone personal computers decide to update their computer system. They employ a consultant who recommends that they install a network.

(i) Apart from sharing hardware such as a printer, give **two** reasons why the consultant would probably recommend installing a network. [2]

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(ii) Give **one** reason why the consultant might recommend keeping some stand-alone computers. [1]

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(iii) The consultant recommends networking the computers using a star network topology. Draw a diagram that illustrates this topology. [1]

(iv) Give **one** advantage and **one** disadvantage of using a star network topology rather than other topologies. [2]

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4. Students enrolling on a college course are asked to provide personal details: these include their *postcode* and *number of GCSE subjects for which they have achieved grades A*-C*, which should be an integer. These details are entered into the college computer system.

Describe suitable validation checks that could be carried out on this data and give an example of **invalid** data that would be detected by **the check described**. A **different** validation check must be used in **each** case. [4]

Postcode

Description of validation check ....

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Example of **invalid** data that would be detected by **this** check

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Number of GCSE subjects for which they have achieved grades A*-C

Description of validation check ....

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Example of **invalid** data that would be detected by **this** check

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Turn over.

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5. *Sun All Year* is a tanning studio. Client details are collected during their first visit and these details are stored on paper in files at reception.

The number of clients is growing and the studio owner believes that storing the client details on a new computerised database system could improve the business.

The studio has found that contacting clients using the paper-based system is extremely time consuming.

(i) Describe **one** other possible problem with the current paper-based system that may lead to the studio losing business. Describe how a computerised database system could solve **this** problem. [2]

Problem ....

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Solution ....

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(ii) Describe **two** ways in which the studio could use a computerised database system containing the client details to attempt to increase the number of visits from clients. [2]

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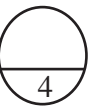
6. *(a)* The operating system of a computer provides an interface between the hardware and the user. Describe **three** typical functions of the operating system from the user's point of view.

[3]

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(b) (i) A gas company uses *batch processing* to produce quarterly bills. Describe how *batch processing* works in this case and explain **why** it is the most suitable mode of operation.

[2]

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(ii) A nuclear power station uses *real-time processing* to control reactor temperature. Describe **in detail** how *real-time processing* works in this case and explain **why** it is the most suitable mode of operation.

[3]

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Turn over.

7. A holiday company specialises in adventure ski holidays. The company has thousands of customer records which are stored on a computer. These records include information about customer financial status.

The manager of the company is concerned about computer crime and believes that some computing staff may be benefiting illegally from their position.

   (i)   Describe **one** way in which a dishonest employee with access to customer records could illegally benefit from their position in the company. [1]

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   (ii) All company employees are asked to comply with the company code of conduct. Describe **one** effect a code of conduct may have on the behaviour of employees. [1]

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   (iii) Security systems introduced by the company include the use of usernames and passwords. Describe **two** other measures that could be adopted to prevent its computing staff illegally benefiting from their position in the company. [2]

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   (iv) The company has registered with the Data Protection Commissioner. The company complies with two principles of the Data Protection Act by processing the data lawfully and storing the data securely. State **three other** principles of the Data Protection Act with which the company will need to comply. [3]

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8. *(a)* Explain the difference between *serial file organisation* and *sequential file organisation*. [2]

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(b) Records can be *fixed* length or *variable* length. Give **one** advantage of a *fixed* length record and **one** advantage of a *variable* length record. [2]

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(c) (i) A water company sends bills out to every customer. Draw a **detailed diagram** that clearly shows how the *master file* and the *transaction file* are used to produce the bills. [4]

(ii) When bills are produced, several items of data are updated in the *master file*. State **one** data item that is updated. [1]

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9. *(a)* What is the computer term for the number of bits that can be processed as a single unit by the CPU? [1]

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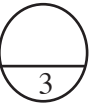
(b) A computer often has to exchange signals with peripheral devices to establish their readiness to send or receive data. What is this communication called? [1]

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(c) Hardware and associated software is required for communication to take place between the processor and a peripheral. What is the name given to this hardware? [1]

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10. *(a)* Explain, using a diagram, how four parallel processors P1, P2, P3 and P4 could be used to find the total of eight numbers 3, 7, 5, 8, 2, 9, 1 and 6. [2]
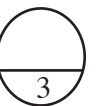
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(b) Give **one** advantage of using parallel processing rather than a single processor. [1]

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Turn over.

11. **In the following question, additional credit (up to 3 marks) will be given if your answer demonstrates skill in written communication.**

A parcel delivery company has many drivers delivering parcels. The parcels are loaded on a van in the morning in the order required for the delivery route. Every parcel has a delivery note that contains all the delivery details and has space for the customer's signature.

The company office frequently needs to contact the drivers to give new delivery instructions. The driver often has to contact the office for alternative routes to avoid congestion and to give reasons for failed deliveries. This communication is currently made using mobile telephones.

The company decides to replace the driver's mobile telephone and paper delivery notes with a new hand held computing/communication device.

Describe what functions this hand held device could carry out.

Describe what methods of input would be most suitable to perform the functions described.

[7 + 3]

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T10

L3

C7

T10

Turn over.

For continuation only (any question)