

Friday 25 May 2012 – Morning

AS GCE COMPUTING

F451/01 Computer Fundamentals

Candidates answer on the Question Paper.

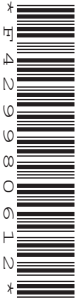
OCR supplied materials:

None

Other materials required:

None

Duration: 1 hour 30 minutes



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **100**, of which marks are allocated to the assessment of the quality of written communication where an answer requires a piece of extended writing.
- This document consists of **16** pages. Any blank pages are indicated.

1 (a) State the meaning of each of the following.

Hardware

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Software

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[2]

A student has a laptop computer.

(b) The computer uses systems software and applications packages.

Explain the difference between systems software and applications packages.

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[4]

(c) The student is writing a piece of software as part of a project. The software will be used with 5 year-old children to test their understanding of numbers.

Describe the following forms of output, explaining why they will be used.

(i) Animations

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[2]

(ii) Interactive presentation

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..... [2]

(iii) Reports

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..... [2]

2 A company employs a large number of workers who spend at least part of their week working from home. A systems analyst has been employed by the company to improve their computer communication systems.

(a) (i) Explain why it is important to define the problem accurately.

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..... [2]

(ii) State what part the manager of the company and the systems analyst each play in the final problem definition.

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..... [2]

(b) After the analyst has agreed on a problem definition it will be necessary to carry out a feasibility study.

(i) State **four** questions that the feasibility study would be expected to answer for any proposed solution.

1

2

3

4 [4]

(ii) Explain why each of the points that you made in answer to (i) are important in this example.

1

2

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4 [4]

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..... [8]

(b) The memory of a computer system contains both RAM and ROM.

(i) State **two** differences between RAM and ROM in a typical PC computer system.

- 1.
- 2. [2]

(ii) State **one** item of software which would need to be stored in ROM and give a reason for your choice.

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..... [2]

4 (a) Express the denary number +123 as:

(i) a binary number in a single 8 bit byte

..... [1]

(ii) a binary-coded decimal (BCD) number.

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..... [3]

(b) (i) Express the denary number -53 as an eight bit, two's complement binary number.

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(ii) Calculate $123 - 53$ using two's complement.

Show your working.

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5 A company specialises in the testing and repair of valves in industrial situations.

(a) One part of their work is to test the pressure at which the valve will fail. This is done by taking various readings and then inputting them into a program which will output the predicted failure pressure.

Explain why this software will be custom-written.

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..... [2]

(b) The company also uses generic applications software.

State how the company could use each of the following types of software.

Database

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Word processor

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Presentation software

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[3]

(c) There are many thousands of different types, sizes and makes of valves. The engineers need to be able to access information about all of these valve types when doing the testing on-site. A knowledge-based system is written which the engineers can access on their laptop computers.

(i) Describe the purpose of **three** parts of the knowledge-based system.

- 1.
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 - 2.
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 - 3.
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- [6]

(ii) Explain how the engineer would use the knowledge-based system.

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- [3]

6 (a) (i) Describe the characteristics of a WAN (wide area network).

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..... [2]

(ii) A company has offices in Leeds and in Bristol. Each of the offices has a LAN (local area network) and the company decides to connect the two LANs in a WAN.

Describe the extra hardware that would be required for this new network.

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(b) When data is transmitted on a network it can use a number of different transmission modes.

State what is meant by each of the following modes of data transmission.

Simplex

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Duplex

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Half-duplex

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[3]

(c) When communications are carried out on the network, rules for communication must be agreed. One of the rules is the bit rate, or the number of bits that will be transmitted and received per second.

(i) Describe **two** other rules that need to be agreed before communication can begin.

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[4]

(ii) Many different types of data will need to be communicated.

Explain, giving examples, the relationship between bit rates and the time sensitivity of the information being communicated.

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[6]

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..... [8]

8 A badminton club in a large city has teams which play in a number of leagues on a weekly basis. The club secretary deals with all the administration by using a home computer.

(a) The secretary has been advised that he should take regular backups and archives.

(i) Explain what is meant by backing up and archiving of files and the importance of each.

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(ii) Describe a suitable back-up routine which the secretary could follow.

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(b) The club secretary is blind.

State a set of peripheral devices which would be appropriate for the secretary to use in this case giving reasons for your answers.

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