



22067013

**COMPUTER SCIENCE
STANDARD LEVEL
PAPER 1**

Tuesday 2 May 2006 (afternoon)

1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

- Do not open this examination paper until instructed to do so.
- Section A: answer all the questions.
- Section B: answer all the questions.

SECTION A

Answer **all** the questions.

1. Define *semantics* and *syntax* and give an example of how they each relate to programming code. [4 marks]

2. Describe the role of *buses* in the machine instruction cycle. [4 marks]

3. Define *data integrity* and identify **one** factor that affects *integrity* when data is transmitted from one computer to another. [2 marks]

4. Describe an example of *multi tasking* on a personal computer. [2 marks]

5. Outline **two** advantages to a programmer of modularity at the design stage of a program, which is being coded for the first time. [4 marks]

6. Explain why data must be ordered if a *binary search* is used. [2 marks]

7. Outline the way in which a *macro* could be used when producing a document with a word processor. [2 marks]

8. Define the terms *function argument* and *function parameter*. [2 marks]

9. Define *virtual memory* and give an example of when it might be used. [2 marks]

10. Explain **one** reason why flash memory is increasingly being used as a portable storage medium. [3 marks]

11. (a) Trace the following algorithmic extract for an input of 34. *[2 marks]*

```
{input (i);  
  k = i mod 6;  
  m = i div 6;  
  output (m*6+k);  
}
```

- (b) Determine the output if any integer, n , is input. *[1 mark]*

SECTION B

Answer all **four** questions.

12. A fabric designer, working for a company based in the centre of town, uses a computer to draw new designs.

- (a) Outline the functions of a *graphics tablet* and a computer display in the creation of an original design. *[2 marks]*

The designer works from home to produce the designs and then sends them to the company in town. A successful design is output in many ways. Brochures are produced including samples of the designs, advertisements are added to the website and the designs are sent directly to a machine which prints the design onto fabric.

- (b) Describe the communications requirements for a system that would allow for the transmission of data from the designer to the company, and then to the required output devices. You should include the communication media in your answer. *[4 marks]*

The machine which prints onto fabric receives the data for the design directly. It is a dedicated device and has a microprocessor.

- (c) Outline the need for ROM in the microprocessor and identify what it would need to hold. *[4 marks]*

13. A travel agent has regular customers who book holidays in different countries throughout the year. It is decided to set up a database of these clients which can be used to contact them, check their details and award bonus points when they have spent more than a certain amount of money with the agency.
- (a) Outline **one** benefit to the agency of employing a software house to develop a purpose built program for this system. *[2 marks]*
 - (b) Describe how information could be collected for the design stage of the program. *[2 marks]*
 - (c) Outline **one** factor which would influence whether records of the customers should be stored in *sequential* or *direct access* form. *[2 marks]*
 - (d) Explain why the development process would be cyclical. *[4 marks]*

14. A home computer user buys a digital video camera and its accompanying communication and editing software.

(a) Describe the advantages and disadvantages of online help being available to support this software as opposed to a printed user guide. *[4 marks]*

(b) Discuss the computer specifications required for such a system. *[4 marks]*

The user posts a video of a family event on a website and sends an email to all those who were present at the event, giving them the address of the website.

(c) Discuss the problems involved in doing this. *[2 marks]*

15. Many banks offer an online banking service, over the Internet, whereby customers can log into the bank's website and make various transactions.

(a) Define *encryption* and outline its use in this case. [3 marks]

(b) Describe how the system can ensure that a customer can gain access to the correct account and not to any other. [3 marks]

One particular bank holds information on bank accounts on one large central server.

(c) Construct a *systems flowchart* that illustrates how a customer logging on to the Internet can access a particular bank account. Include any gateways in your illustration. [4 marks]
