



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

COMPUTING

9691/12

Paper 1

October/November 2009

2 hours 30 minutes

Additional Materials: Answer Booklet/Paper

READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

This document consists of **5** printed pages and **3** blank pages.



- 1 A student has a stand-alone computer at home and also uses the computers at school. She uses a USB stick, a DVD-RW drive and a CD-ROM drive on her home computer.
- (a) State a use that the student could make of each of the following, justifying your choices.
- (i) USB stick [2]
 - (ii) DVD-RW drive [2]
 - (iii) CD-ROM drive. [2]
- (b) State **one** other storage device that the student would need at home and say why it would be needed. [2]
- 2 (a) Define the following types of software:
- (i) operating system software,
 - (ii) generic applications software,
 - (iii) translator software,
 - (iv) utility software. [4]
- (b) A computer system is based in a chemical factory. The chemical processes are all automatically controlled by the computer system which is operated from a central point.
- Discuss why it is important to have a good interface design on the system. [6]

- 3 A library stores details of members on the member file.
- (a) Members' names are stored as strings of characters using ASCII.
- (i) State what is meant by a character set. [1]
- (ii) Describe how the ASCII character set is represented. [3]
- (b) When a member's name is input to the system it needs to be validated.
- (i) State what is meant by validation. [1]
- (ii) Describe **two** validation checks that can be carried out when a member's name is input to the system. [4]
- (c) The number of visits made by a member during the year is stored as an integer in a single byte. Mr Jyu has visited 135 times.
- Change 135 into the binary representation for the computer to store. [2]
- (d) The member file contains up to 10,000 records. The estimated size of each record is 250 bytes.
- Estimate the size of the member file using appropriate units. (Show your working.) [5]
- (e) Describe how the following types of software can be used in the library:
- (i) spreadsheet, [2]
- (ii) presentation software, [2]
- (iii) mail-merge software. [2]
- 4 (a) A medical centre has a number of stand-alone computers. It is decided that these should be linked in a LAN.
- (i) State **three** advantages and **one** disadvantage of networking the computers. [4]
- (ii) Explain the relationship between bit rates and the use of data content in a network. [2]
- (b) Describe the additional hardware required when a LAN is connected to a WAN. [4]

The remaining questions refer to the following information.

A large college has a cafeteria and an automated snack bar. Only staff and students of the college are allowed to purchase food and drink there.

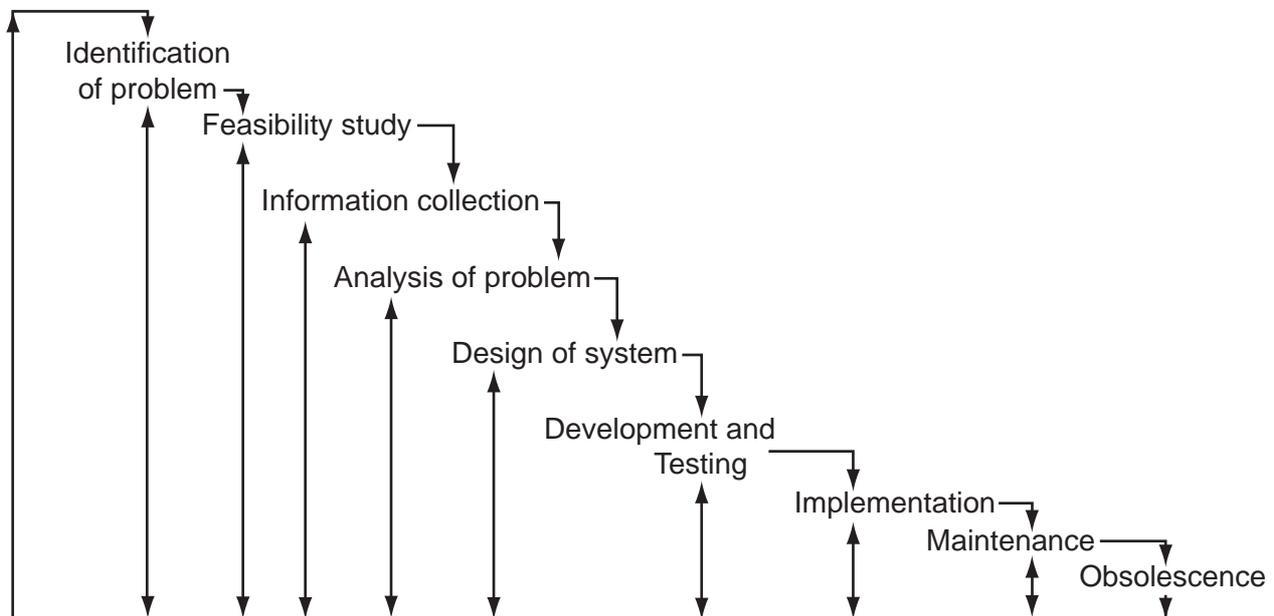
5 The college decides to computerise the accounts of the cafeteria. The manager needs to decide between using off-the-shelf software or custom-written software.

(a) Explain the difference between off-the-shelf and custom-written software. [2]

(b) State **three** advantages of using off-the-shelf software in this situation. [3]

6 It is decided to employ a systems analyst to produce the new computer system. The analyst follows the system life cycle.

(a)



The system life cycle is shown in the diagram. Explain why the cycle is considered to be an iterative process. [3]

(b) Describe how **three** parts of the feasibility study, carried out by the analyst, relate to the cafeteria and automated snack bar. [6]

- 7 Staff and students who buy food are identified by the system. Their purchases are charged to their accounts. These accounts are paid off at the end of each term.
- (a) Each student carries a magnetic stripe card to use with the system.
- (i) Describe how such a card works. [2]
- (ii) State **two** safeguards against improper use if it is stolen. [2]
- (b) Some members of staff are worried that their information may be misused. Data protection legislation is used to protect personal data.
- Describe the features of such legislation. [6]
- (c) The total value of the goods which a person has bought is shown at a checkout. Each person is given a statement, informing them what they currently owe, at the end of each month.
- (i) Explain what is meant by a batch operating system and state which of the two processes would be carried out by a batch operating system. [3]
- (ii) State a type of operating system which could be used for the other process described and justify your choice. [2]
- (d) Describe a report that a Management Information System (MIS) could produce from the collected data. [2]

- 8 **Candidates are advised to use either pseudo code or a flow diagram to answer this question, although other forms of algorithmic representation will be credited.**

The automated snack bar is a machine.

The machine advertises 10 snack items; each one is given a number from 0 to 9.

The user presses one of the buttons from 0 to 9 on the front of the machine. The machine checks in an array in its memory to find the price of the snack selected. This price is displayed on the front of the machine.

The customer then inserts 1-cent and/or 5-cent coins. Each time a coin is input the machine subtracts the value from the amount still required. The display changes to show the new amount still required.

When enough coins have been inserted the machine will deliver the item and pay out any change necessary.

Write an algorithm to control the process of buying a snack. [9]

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