[C017/SQP060]

# Intermediate 2 Computing

Time: 1 hour 30 minutes

NATIONAL QUALIFICATIONS

Specimen Question Paper

Read each question carefully.

Attempt **all** questions.

Write your answers in the answer book provided. **Do not** write on the question paper.

Write as neatly as possible.

Answer in sentences wherever possible.

SCOTTISH QUALIFICATIONS

## SECTION I

*Marks*

**1.** (*a*) Most microcomputers have both RAM and ROM.

Describe the differences between these two types of memory. **1**

(*b*) State **two** reasons for the need for an *interface* between the CPU and peripheral devices. **2**

(*c*) Name **three** types of data which can be stored in computer memory. **1**

(*d*) Describe, with an example, how the *ASCII code* represents alphanumeric characters. **2**

(*e*) Processing power is a characteristic that may be used to distinguish between different computer systems.

Give **two** other characteristics that may be used. **2**

(*f*) Describe **two** benefits of having computers connected in a network. **2**

**(10)**

**2.** (*a*) Three types of commonly used applications software are text, number and integrated.

Name **two** other types of commonly used applications software. **2**

(*b*) Describe **two** characteristics of an integrated package. **2**

(*c*) What is an *operating system*? **1**

(*d*) Name **three** of the functions of an operating system. **2**

(*e*) Explain the term *Human Computer Interface*. **1**

(*f*) What must be done to a program written in a *High Level Language* before it can be executed? **1**

(*g*) Name **two** High Level Languages suitable for teaching programming. **1**

**(10)**

**3.** (*a*) Describe in detail the characteristics of **two** different types of *output* devices. **2**

(*b*) Describe in detail the characteristics of **two** different types of *storage* devices. **2**

**(4)**

**4.** (*a*) *Analysis* and *Design* are two stages in the software development process. Name **three** other stages. **1**

(*b*) *Design* means a methodical planning of a solution.

Describe any **three** other stages in the software development process. **3**

(*c*) A technique employed in design is the use of a *structure diagram* or *pseudo-code*.

Describe **one** other technique and **one** tool used in the software development process. **4**

(*d*) Name **two** desirable characteristics of high quality software and describe how each could be achieved. **4**

**(12)**

**5.** With reference to a programming language which you have used, explain what is meant by the following terms and give **one** example of how each could be implemented.

(*a*) Modularity

(*b*) Control **4**

## SECTION II

**6.** A Do-It-Yourself store sells a large range of goods.
The checkout at the store is shown below.

(*a*) Study the diagram above and say what type of input device is being used at the checkout. **1**

(*b*) A central computer processes information about each item. What type of backing storage device must this computer have? Give a reason for your answer. **2**

(*c*) Describe **two** benefits to the management of the store of using a computerised system. **2**

(*d*) Every week the staff in the store carry out a stock check. The forms they use to record the stock levels are input to the computer system using optical character recognition (OCR). Why must the staff be careful with their handwriting when filling in the OCR forms? **1**

(*e*) The store is considering using palmtop computers for stock checks. Suggest **two** advantages that palmtop computers may have over using OCR forms. **2**

**(8)**

*Marks*

7. (*a*) Software development is normally an iterative process. Give an example of iteration in the stages of the software development process. **2**

(*b*) With reference to a software environment with which you are familiar, describe the use of an *editor* and *error tracing* facilities. **2**

(*c*) It is vital that a programmer should consider the *user interface* when designing a program.

(i) Explain what is meant by the term *user interface*. **2**

(ii) Describe **two** ways in which the user interface may be improved for a physically handicapped user. **2**

(*d*) Describe **two** problems that may arise if a program is not accompanied by its proper documentation. **2**

(*e*) Programs written in a high-level language must be translated into machine code before execution by the computer. The translation is done by a *compiler* or an *interpreter*.

State **two** ways in which a compiler differs from an interpreter. **2**

**(12)**

[*END OF QUESTION PAPER*]

[C017/SQP060]

# Intermediate 2 Computing

Specimen Marking Instructions

NATIONAL QUALIFICATIONS

SCOTTISH QUALIFICATIONS AUTHORITY

**Intermediate 2**

**Computing**

**SECTION I**

Q1 (C/SLO1)

a) **RAM contents can be read and altered. The contents are not permanent – when the computer is switched off they are lost.**
**ROM contents can only be read – they cannot be changed. The contents are permanent – when the computer is switched off they are not lost.**

Full description for 1 mark

b) **Interface required because CPU is a digital device and the peripheral may be analogue. (1); different signal levels/specifications. (1)**

c) **Numeric**
**Text**
**Graphic**

Must give three types for 1 mark

d) **Each value in the ASC11 code represents a particular character. (1)**
**eg 65 (decimal) represents the character A. (1)**

e) **display systems (1)**
**memory size (1)**

f) **Sharing software/hardware (1)**
**Communications eg e-mail (1)**

Q2 (CS/LO2)

a)
- **database (data)** (1)
- **communications (Internet)** (1)
- **multimedia** (1)

max. 2 marks

b)
- **common HCI** (1)
- **easier to transfer/link data between different modules** (1)
- **cheaper to purchase integrated package than all individual applications** (1)

max. 2 marks

c) **An operating system is a set of programs which control the computer.** (1)

d)
- **memory management** (1)
- **file management** (1)
- **input/output control** (1)
- **job scheduling** (1)
- **error reporting** (1)

2 marks for three correct functions, 1 mark for two functions,
zero marks for one function

e) **The human computer interface is the way the user and the program communicate with each other** (1)

f) **Translated to machine code.** (1)

g) Accept any valid answer eg, **Basic, Comal, Pascal, etc** (1)

Q3 (CS/LO3)

a) Description of the characteristics of any two of the following:

- **Dot matrix printer**
- **Ink jet printer**
- **Laser printer**
- **Plotter**

Give 1 mark per device.

b) Description of the characteristics of any two of the following:

- **tape drives**
- **disc drives**
- **CD-ROM drives**

Give 1 mark per device.

Q4 (SD/LO1)

a)
- **implementation**
- **testing**
- **documentation**
- **evaluation**
- **maintenance**

1 mark for any three stages.

b)
- **Design involves the methodical planning of the solution to the problem.** (1)
- **Implementation requires the translation of the design plans into instructions that the computer can understand.** (1)
- **Documentation produced would consist of a user guide and a technical guide.** (1)
- **Evaluation would involve reviewing the solution against the problem statement.** (1)
- **Maintenance involves making changes to the program at some time in the future.** (1)

maximum 3 marks

c)
- **test data - the use of comprehensive sets to check that software works properly**
- **structured listing – a formatted display or printout of solution code**
- **error reporting – the generation within the environment of messages indicating errors.**

Give 1 mark for naming and 1 mark for the description
maximum 4 marks

d)
- **user interface - this may relate to screen prompts for the user or the screen layout or the visual impact of the solution**
- **fitness for purpose – a solution which works properly and does what it is intended to do**
- **documentation – user guide, technical guide**
- **maintainability – software must be developed to take account of the possible needs to be +-corrected and updated in the future.**

Give 1 mark for naming and 1 mark for the description
Maximum 4 marks

Q5 (SD/LO2)

a)
- **Programs are split up into modules (procedures and functions), (1) each module doing a specific task. (1)**

b)
- **In procedural high level languages there are three ways of transferring control from one part of the program to another. (1) These are sequencing, looping and branching. (1)**

**SECTION II**

Q6

a)
- Barcode Scanner (1)

b)
- hard disc (1)
- fast access and the need to update stock levels (1)

c)
- customers pass through the checkouts more quickly and with less errors being made by the assistants.
- goods in the shop do not have to be individually priced
- the control of stock is fully automated; as each product passes through the checkout the level of stock is adjusted
- more efficient stock control means less stock needs to be kept, thus saving on both space and money
- as all the sales are monitored the managers can monitor the demand at the checkouts and ensure the correct staffing level

(1 mark per benefit, maximum 2 marks)

d)
- The ability to scan characters accurately depends on how clear the handwriting is. (1)

e)
- The data can be transferred directly from machine to machine
- no writing is necessary
- don't need to handle forms
- faster data entry

(1 mark for each of two valid answers; do not accept "portability" as an answer)

Q7

a) Accept any answer which describes the iterative nature of the software development process. (2)

- analysis
- design
- implementation
- testing
- documentation
- evaluation
- maintenance

b) • ability to make amendments using a text editor rather than re-entering data. (1)

description of simple error tracing tool to find errors. (1)

c) • user interface: reference to visual appeal, screen layout and prompts for the user (2)

use of touch screens, voice input/output (2)

d) • documentation will guide the user on how to install and use the software. It will also include a simple technical guide with details of the hardware requirements.

Give 1 mark for description of a problem relating to installation of software.
Give 1 mark for description of a problem relating to use of software.

e) • a compiler translates the whole program into object code whereas an interpreter changes a high level language into machine code one instruction at a time (1)

the object code from a compiler can be saved, you can't save the object code produced by an interpreter. (1)

[END OF MARKING INSTRUCTIONS]