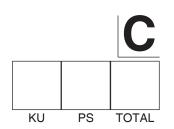NATIONAL QUALIFICATIONS 2012

COMPUTING STUDIES
STANDARD GRADE
Credit Level

WEDNESDAY, 25 APRIL
1.00 PM – 2.45 PM

C

KU   PS   TOTAL

0560/31/01

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth
Day   Month   Year   Scottish candidate number

Read each question carefully.

Attempt **all** questions.

Write your answers in the space provided on the question paper.

Write as neatly as possible.

Use **blue** or **black ink**.

Answer in sentences wherever possible.

Before leaving the examination room you must give this book to the Invigilator. If you do not, you may lose all the marks for this paper.

SQA

1. Lochview High School is a large community school that uses a computer system to monitor and control access to its many facilities.

(*a*) The computer system operates smoothly thanks to the work of the *network manager* and *engineer*. Describe the role of each person in the smooth running of the system.

Network Manager _____

_____

_____

Engineer _____

_____

_____

(*b*) Staff and pupils have a *smartcard* which is used to pay for food, gain access to teaching areas and record attendance.

State **two** features of a smartcard that would be useful in this situation.

1 _____

_____

2 _____

_____

(*c*) Doors to the teaching areas remain locked until the computer receives a signal that access is needed. When staff and pupils hold their smartcards against the door's scanner, the card is *verified*, access is permitted and the doors automatically unlock.

(i) State what is meant by *verification*.

_____

_____

(ii) State the type of *processing* involved.

_____

05603101 02

1. **(*c*)** **(continued)**

(iii) Describe **one** other software method of security that could be used to restrict access to certain areas.

_____

_____

_____

1

(*d*) When pupils first join the school, their information is entered into the computer system. This user data is stored in a *database* that can be accessed by staff throughout the building at the same time.

State the term used to describe such a database.

_____

1

(*e*) Data about the pupils is used in a range of different processes from registration to keeping a record of what they have purchased in the school canteen.

State the term used to describe this data.

_____

1

(*f*) The *Data Protection Act* requires that the *data controller* ensures that data is kept secure.

(i) State **two** other responsibilities that the data controller has under this Act.

1 _____

_____

1

2 _____

_____

1

(ii) Identify the data controller is this situation. Circle the correct answer.

Teacher   **Head Teacher**   **Technician**

1

[Turn over

0560310103

2. Mr Asimov keeps a record of his pupils' homework marks. Part of the spreadsheet is shown below.

	A	B	C	D	E	F	G	H
1	**Homework Record**					**Target Mark**		60
2								
3	**Forename**	**Surname**	**HW1**	**HW2**	**HW3**	**HW4**	**Total Mark**	**Letter Home?**
4	Charles	Babbage	5	10	3	7	25	YES
5	Daisy	Cameron	18	10	11	20	59	YES
6	Duncan	Cameron	13	12	14	15	54	YES
7	Lillian	Edwards	11	8	13	12	44	YES
8	Rian	Shah	14	15	16	11	56	YES
9	Holli	Chung	15	17	18	19	69	NO
10	Angus	Russell	19	18	20	13	70	NO

(*a*) Cell G4 automatically calculates the total homework mark.

Complete the formula that was entered in cell G4.

= _____ (C4 : _____)

(*b*) The Total Mark is compared to the Target Mark in H1 to see whether a letter should be sent home informing parents of concerns with homework. Concerns are raised if the Total Mark is less than the Target Mark. Cell H4 contains the formula that carries out this comparison.

(i) Complete the formula that was entered into cell H4.

= **IF** (_____ < H$1, _____ , _____)

(ii) The above formula contains a $ sign. Explain fully why this is needed.

_____

_____

_____

_____

_____

05603 10104

2. (continued)

(*c*) Mr Asimov has *sorted* the spreadsheet so that all those pupils receiving letters are at the top of the list. Pupils have then been sorted alphabetically by surname.

State the order of columns in which this *complex* sort was carried out.

Indicate whether the sort is ascending or descending.

The last entry has been done for you.

1	Column		ASCENDING	DESCENDING
2	Column		ASCENDING	DESCENDING
3	Column	**A**	(ASCENDING)	DESCENDING

(*d*) The letters to be sent home will contain information taken from the spreadsheet.

(i) State the process that Mr Asimov will use to allow him to produce personal letters without creating each one individually.

_____

(ii) A sample of one of the letters is shown below.

Lochview High School
Dervaig
PA65 6NU
01688 767543

Dear Mr & Mrs (Babbage)

Charles has achieved 25 for the total homework mark so far this year. I wish to talk to you about this performance at the S4 Parents' Evening. I look forward to seeing you there.

Yours sincerely

Mr I Asimov
PT Computing Science

It contains three placeholders. Identify each one and state a suitable field name for each. The first one has already been done for you.

Placeholder	Data	Field Name
1	Babbage	Surname
2		
3		

2. (continued)

(*e*) Mr Asimov decides to take an electronic copy of the letters home so that he can check them. Unfortunately, he is unable to open them using his word processing software.

(i) State a reason why this may have happened.

_____

_____

1

(ii) Describe a solution to this problem.

_____

_____

_____

1

05603 1 0106

3. Finlay has just bought a new cleaning gadget for his home, the Vac Bot.

(*a*) It is an *embedded system* that travels around each room, avoiding all obstacles, detecting the type of flooring (hard flooring or carpeted) and altering its brush level to suit.

(i) Describe an embedded system.

_____

_____

_____

1

(ii) State a storage medium used by an embedded system.

_____

1

(iii) As well as this storage medium, it also contains *analogue to digital converters*.

Explain why the Vac Bot must contain analogue to digital converters.

_____

_____

_____

_____

2

(*b*) Advertising for the Vac Bot describes it as being "the first *intelligent robot* for your home".

Describe **two** features that a robot should possess in order to be termed "intelligent".

1 _____

_____

_____

1

2 _____

_____

_____

1

4. Juliette has recently become a member of a world-wide social networking site.

(*a*) Her personal details are now stored in a database on the site's *mainframe* computer.

State **two** reasons why it is necessary for large organisations to use a mainframe computer system.

1 _____

_____

2 _____

_____

(*b*) The mainframe has both *sequential* and *random access backing storage devices*.

Compare these devices in terms of their **use**.

_____

_____

_____

_____

_____

(*c*) Juliette wants to get in touch with friends from her schooldays. She attended St Ninian's High School in Aberdeen, leaving in the year 2004.

She enters a *complex search* into the networking site's *search engine*.

Write down what Juliette entered to get a list of old school friends.

_____

_____

_____

_____

4. (continued)

(*d*) Juliette has added a photograph to her user profile. The file size is 52 *kilobytes*.

How many *bits* are in 52 kilobytes?

Show all your working.

_____

_____

_____

_____

(*e*) Using her *ISP* and *desktop* computer, Juliette is able to check the social networking site on a daily basis.

   (i) Apart from accessing the Internet, state **one** other facility that an ISP could provide.

_____

_____

_____

  (ii) State a hardware device that a desktop computer must have to enable connection to the Internet.

_____

(*f*) Mobile phones also give access to the Internet. State **one** advantage and **one** disadvantage that users may experience when using *mobile Internet technologies*.

Advantage _____

_____

Disadvantage _____

_____

[Turn over

5. Alex is a programmer and is currently developing a new *integrated package*.

(*a*) Alex uses **two** types of *translator* for this project. State the type of translator that would be used for each stage of the project. Give a reason for your choice.

    (i) **Translator used <u>during</u> the development stage:**

      _____

      Reason _____

      _____

      _____

    (ii) **Translator used at <u>the end of</u> the development stage:**

      _____

      Reason _____

      _____

      _____

(*b*) Alex wants to include *dynamic linkage* and *keyboard shortcuts* in the integrated package. Explain why each feature would be desirable to users of integrated packages.

Dynamic Linkage _____

_____

_____

_____

_____

Keyboard Shortcuts _____

_____

_____

_____

1

1

1

1

2

2

05603 10110

5. (continued)

(*c*) The computer Alex uses has the latest microprocessor technology. Like all processors, it has an *ALU* and *registers*. State the **function** of each component.

ALU _____

_____

_____

Registers _____

_____

_____

(*d*) Each time Alex saves the program, the computer's *operating system* is involved.

Draw lines to show the correct relationships in the diagram below.

File Management	Message appears — "disk full"
Memory Management	Operating System manages the files on the computer
Error Reporting	User chooses **File**, then **Save as . . .**
Managing Inputs/Outputs	Operating System allocates suitable storage locations

[Turn over

0560310111

6. Fourth year Computing Studies pupils have been asked to re-design the school's *website*.

(*a*) They consider using *HTML* to create the website.

(i) State what the initials HTML stand for.

_____

1

(ii) State **one** advantage and **one** disadvantage of using HTML to create a website.

Advantage _____

_____

_____

1

Disadvantage _____

_____

_____

1

(*b*) One of the girls has brought in a *shareware* application, "Web Genie", on her *USB flash drive*.

State what is meant by the term shareware.

_____

_____

_____

_____

2

(*c*) They decide to use Web Genie, accessing the package's *wizard* as a first step to creating their website.

Explain why using a wizard is useful in this situation.

_____

_____

_____

_____

2

05603101112

6. (continued)

(*d*) A *table* is added to one of the web pages. It contains information on school events and will include photographs, text and *hotspots*.

(i) State what is meant by a hotspot.

_____

_____

_____

1

(ii) State **one** advantage of using a table, apart from keeping the layout of the web page organised.

_____

_____

_____

1

(*e*) The pupils are asked to include a photograph from a magazine. The photograph is of a famous ex-pupil.

(i) State how they can include this photograph in the website.

_____

1

(ii) Explain why the pupils might be breaking the law by using this photograph.

_____

_____

_____

1

(iii) Explain how this photograph could be included without breaking any laws.

_____

_____

_____

1

6. (*e*) (continued)

(iv) When the photograph is inserted into the table, it is apparent that it is too big. The neat table layout is ruined as the table adjusts to suit the graphic.

State **two** different methods that the pupils could use to adjust the graphic to suit the size of the table.

1 _____ **1**

2 _____ **1**

[*END OF QUESTION PAPER*]

ADDITIONAL SPACE FOR ANSWERS

05603 10115

ADDITIONAL SPACE FOR ANSWERS

ACKNOWLEDGEMENTS