

FOR OFFICIAL USE

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C

NATIONAL QUALIFICATIONS 2012

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KU PS TOTAL

# COMPUTING STUDIES STANDARD GRADE

Credit Level



\* 0 5 6 0 3 1 0 1 \*

WEDNESDAY, 25 APRIL  
1.00 PM – 2.45 PM

## 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

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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.



\* 0 5 6 0 3 1 0 1 0 1 \*

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

DO NOT  
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IN THIS  
MARGIN

(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.

\_\_\_\_\_

KU	PS
	1
	1
	1
1	1
	1



1. (c) (continued)

DO NOT  
WRITE  
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MARGIN

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

KU	PS
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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 in this situation. Circle the correct answer.

**Teacher                  Head Teacher                  Technician**

1

[Turn over



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

DO NOT  
WRITE  
IN THIS  
MARGIN

	A	B	C	D	E	F	G	H
1	<b>Homework Record</b>					<b>Target Mark</b>		60
2								
3	<b>Forename</b>	<b>Surname</b>	<b>HW1</b>	<b>HW2</b>	<b>HW3</b>	<b>HW4</b>	<b>Total Mark</b>	<b>Letter Home?</b>
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 : \_\_\_\_\_ )

1

(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, \_\_\_\_\_ , \_\_\_\_\_ )

3

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

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3



2. (continued)

DO NOT  
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IN THIS  
MARGIN

- (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 <b>A</b>	ASCENDING	DESCENDING

KU PS

2

- (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.

\_\_\_\_\_

1

- (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



2. (continued)

DO NOT  
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MARGIN

(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.

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

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1

(ii) Describe a solution to this problem.

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1



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



DO NOT  
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MARGIN

(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.

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1

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

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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.

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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 \_\_\_\_\_

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1

2 \_\_\_\_\_

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1



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

DO NOT  
WRITE  
IN THIS  
MARGIN

(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.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

KU	PS
1	
1	
2	
	3





4. (continued)

DO NOT  
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MARGIN

(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.**

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KU	PS
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2

(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.

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1

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

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1

(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** \_\_\_\_\_

---

1

**Disadvantage** \_\_\_\_\_

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1

[Turn over



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

DO NOT  
WRITE  
IN THIS  
MARGIN

(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.

KU	PS
	1
	1
	1
	1
	2
	2

(i) **Translator used during the development stage:**

\_\_\_\_\_

**Reason** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(ii) **Translator used at the end of 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** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



5. (continued)

DO NOT  
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IN THIS  
MARGIN

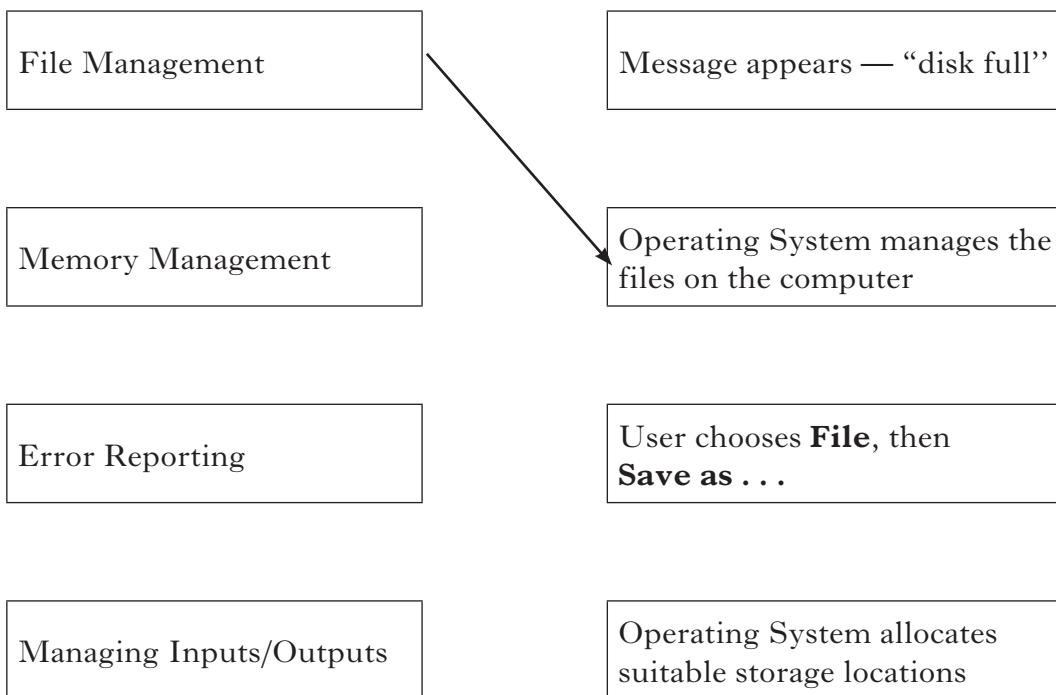
- (c) The computer Alex uses has the latest microprocessor technology. Like all processors, it has an *ALU* and *registers*. State the **function** of each component.

**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.



KU	PS
1	
1	
3	

[Turn over



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

DO NOT  
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IN THIS  
MARGIN

(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



6. (continued)

DO NOT  
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MARGIN

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

KU	PS
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(i) State what is meant by a hotspot.

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1

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

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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.

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1

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

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1

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

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1



6. (e) (continued)

DO NOT  
WRITE  
IN THIS  
MARGIN

(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 \_\_\_\_\_

2 \_\_\_\_\_

KU	PS
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1	
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1	
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[END OF QUESTION PAPER]



ADDITIONAL SPACE FOR ANSWERS

DO NOT  
WRITE  
IN THIS  
MARGIN

KU	PS



ADDITIONAL SPACE FOR ANSWERS

DO NOT  
WRITE  
IN THIS  
MARGIN

KU	PS



\* 0 5 6 0 3 1 0 1 1 6 \*



## ACKNOWLEDGEMENTS

Question 3—Photograph of Vac Bot Roomba 560. Reproduced by kind permission of iRobot. ©iRobot® 8 Crosby Drive Bedford, MA 01730.