

FOR OFFICIAL USE

--	--	--	--	--	--

C

NATIONAL QUALIFICATIONS 2013

--	--	--

KU PS TOTAL

# COMPUTING STUDIES STANDARD GRADE

Credit Level



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

FRIDAY, 26 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

--	--

--	--

--	--

--	--	--	--	--	--	--	--	--	--

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. Right Sprites is a graphic design company specialising in the creation of characters for computer games.

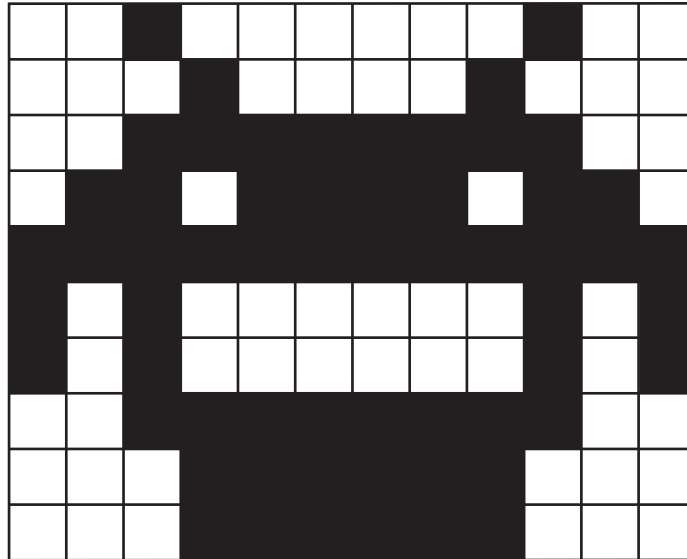


DO NOT  
WRITE  
IN THIS  
MARGIN

(a) A small section of one of the characters is shown below.



It is stored in the computer as the following *bit-mapped* image:



(i) Calculate how many *bytes* of storage space this section of the graphic requires. (Show all working.)

---



---



---

(ii) Using the grid below, indicate how the top four rows of the graphic would be stored as a set of binary digits (bits).


(b) State how **text** is represented in computer systems.

---



---

KU	PS
	2
	2
	1



1. (continued)

DO NOT  
WRITE  
IN THIS  
MARGIN

- (c) Right Sprites have produced a brochure detailing their latest characters. Part of the brochure is shown below. A graphics character has been inserted in the main text. However, the text is obscured behind it, as shown below.

KU	PS
----	----

<h1>Character Creations</h1>	<p>Welcome to our latest collection. We are delighted to introduce our new range of b  graphics characters. Ou  team has been working round the clock to ensure that our new range captures the imagination of all our customers.</p>
------------------------------	---

The problem is identified and steps are taken to ensure that the text flows around the graphic, as shown below in the finished brochure.

<h1>Character Creations</h1>	<p>Welcome to our latest collection. We are delighted to introduce our new range of graphics  of bespoke characters. Our design  team has been working round the clock to ensure that our new range captures the imagination of all our customers.</p>
------------------------------	--

State what has been done to ensure that the text flows around the graphic.

---

---

2

[Turn over



2. Pitheavlis Harriers use a spreadsheet to keep track of the performance of their field and track athletes. Part of the spreadsheet is shown below.

DO NOT  
WRITE  
IN THIS  
MARGIN

	A	B	C	D	E	F
1	<b>Field &amp; Track Record: 2012–13</b>					
2	<b>High Jump Target (m)</b>					
3	1·95	<b>Jump1</b>	<b>Jump2</b>	<b>Jump3</b>	<b>Highest Jump</b>	<b>Represent Club?</b>
4	Mancini, Fabiana	1·99	2·01	1·98	2·01	Yes
5	McClusky, Calum	1·99	1·97	1·50	1·99	Yes
6	Etri, Aymen	1·45	1·92	1·91	1·92	No
7	<b>1500m Target (mins)</b>					
8	4·18	<b>Race1</b>	<b>Race2</b>	<b>Race3</b>	<b>Fastest Race</b>	<b>Represent Club?</b>
9	Mancini, Dino	4·20	4·10	4·04	4·04	Yes
10	Etri, Alim	4·18	4·12	4·17	4·12	Yes
11	Honeyman, Hannah	4·22	4·20	4·21	4·20	No

(a) Cell F4 contains a *formula*.

- (i) State the type of formula used in this cell.

\_\_\_\_\_

1

- (ii) This formula was *replicated*. State the range of cells involved in the replication.

\_\_\_\_\_

1

- (iii) Both *absolute* and *relative references* were used in the replication. Explain fully why this was necessary.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2



2. (continued)

DO NOT  
WRITE  
IN THIS  
MARGIN

(b) *Functions* were used in cells E4 to E6 and cells E9 to E11 to determine the best heights and times.

KU	PS
----	----

(i) State the formula that was entered in cell E4.

= \_\_\_\_\_

2

(ii) State the formula that was entered in cell E9.

= \_\_\_\_\_

2

(c) As well as those cells which contain formulae, **two** additional cells in the spreadsheet needed to have *cell protection* applied.

(i) State what is meant by cell protection.

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

1

(ii) State the cell references of the **two** other cells that needed to be protected.

\_\_\_\_\_

1

(d) The team's coach wishes to view the spreadsheet on her home computer.

(i) State the feature of *e-mail* that would allow the coach to send an electronic copy of her work home.

\_\_\_\_\_

1

(ii) When the coach opens the file on her home computer, it is unreadable.

State **two** reasons why this may have happened.

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

2



3. A large electricity supply company has launched a new type of charging unit for electric cars.



DO NOT  
WRITE  
IN THIS  
MARGIN

(a) *Embedded* systems within the car and the charging unit enables re-charging to take place overnight while the car is not in use.

Describe **two** features of an embedded system.

1 \_\_\_\_\_  
 \_\_\_\_\_  
 2 \_\_\_\_\_  
 \_\_\_\_\_

(b) The charging unit is linked to the company's *mainframe* computer. The mainframe updates car details as soon as it receives them from the charging unit.

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

\_\_\_\_\_

(ii) State **two** reasons why large organisations use mainframe computers.

1 \_\_\_\_\_  
 \_\_\_\_\_  
 2 \_\_\_\_\_  
 \_\_\_\_\_

(c) *Data* on the mainframe is used to generate reports providing *information* about cars for company staff.

Describe the difference between data and information.

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

KU	PS
2	
	1
2	
2	



3. (continued)

DO NOT  
WRITE  
IN THIS  
MARGIN

(d) As part of the marketing for the charging unit, the company sends out *standard letters* to potential customers.

(i) Describe what is meant by a standard letter.

---

---

---

---

KU	PS
----	----

2

(ii) Apart from a word processor, state the other application that is usually involved in the creation of standard letters.

---

1

(iii) State the name of the process that inserts information from this application into the word processed document.

---

1

(e) When potential customers contact the company they speak to a customer services operator. An *expert system* is available for the operators.

Describe **two** ways in which the use of an expert system can help the operators when speaking to the customers.

1 \_\_\_\_\_

---

---

2 \_\_\_\_\_

---

---

2



4. Scotia Cars are planning to replace their existing car manufacturing plant. In order to satisfy increasing customer demands for environmentally-friendly vehicles, they intend building a new electric car manufacturing plant.

DO NOT  
WRITE  
IN THIS  
MARGIN

KU	PS
	2
	2
	2

(a) A *systems analyst* is employed at the early stages of the project.

Describe **two** tasks the systems analyst will carry out at Scotia Cars.

1 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(b) The new car manufacturing plant will have automated production lines featuring robotic systems.

State **two** ways in which factories designed for robots differ from those built for human workers.

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

(c) The car plant contains both *stationary* and *mobile* robots. Some of them can be classified as *intelligent*.

Describe **two** hardware features of an intelligent robot.

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_





4. (continued)

DO NOT  
WRITE  
IN THIS  
MARGIN

- (d) The software for robotic systems can be held either on a disk or in ROM.

State **one** advantage of ROM-based software.

---

---

- (e) (i) Name the type of language used when writing programs for robotic systems.

---

- (ii) Explain why this type of language is used.

---

---

---

KU	PS
1	
1	
	1

[Turn over



5. Hope is a Higher Computing pupil. She is organising her revision for the forthcoming examinations.

(a) She has several pages of word processed notes and plans to use a scanner with *OCR* software to transfer them to her laptop.

(i) State what the initials OCR stand for.

\_\_\_\_\_

(ii) Describe why Hope would want to use this feature.

\_\_\_\_\_

\_\_\_\_\_

(b) While accessing the *Internet* to download some past papers, she uses a *browser* and *search engine*.

(i) Describe the role of a browser.

\_\_\_\_\_

\_\_\_\_\_

(ii) State what is meant by the term search engine.

\_\_\_\_\_

\_\_\_\_\_

(c) Hope decides to print out last year's Higher Computing paper.

State the piece of software necessary for her printer to work correctly.

\_\_\_\_\_

(d) She decides to listen to some music and inserts an audio CD into the CD-drive of her laptop. Both the *operating system software* and the *sound card* in her laptop ensure that she is able to hear the music.

(i) State the feature of a sound card that is essential here.

\_\_\_\_\_

(ii) State the feature of the operating system that would allow her to listen to music while, at the same time, surfing the Internet.

\_\_\_\_\_

KU	PS
1	
	1
1	
	1
1	
	1



5. (continued)

DO NOT  
WRITE  
IN THIS  
MARGIN

(e) One function of an operating system is *memory management*.

(i) State how each storage location in memory is identified.

---



---

KU	PS
----	----

1

(ii) Name the term used to describe the number of bits stored in each memory location.

---

1

(iii) State **one** other function of an operating system

---



---

1

(f) Hope decides to take a break from her Higher revision and look over her old Standard Grade notes instead.

She writes down the definition of *static* and *dynamic data linkage*. Parts of her notes are shown below.

“... is a fixed link...” ←

→ “A live link, where data...”

(i) Using the boxes above, enter the type of linkage described.

1

(ii) Choose **one** of the types and describe a situation where it would be useful.

---



---



---



---

1

[Turn over



6. A mobile phone company stores details of its customers in a *database*. An extract from the database is shown below.

DO NOT  
WRITE  
IN THIS  
MARGIN

Phone No	E-mail Address	Basic Contract Fee (£)	Extra Minutes (£)	Extra Text (£)	Total Cost (£)
17795070771	tim@gotest.com	25	5	5	35
17793030189	BDanes2@btnet.co.uk	10	0	5	15
17734267519	sozmac@gotest.com	20	0	10	30
17756411871	edho@infoweb.co.uk	30	0	10	40
17634899766	Pan76@gotest.com	20	10	5	35
17793469221	FRoon@btnet.co.uk	20	5	5	30
17654987122	Ruby16@gotest.com	15	5	5	25

- (a) Total Cost is a *computed field*.

State the formula that was entered in this field.

---



---

- (b) The company has performed a complex search to find all customers with @gotest e-mail addresses who have extra minutes as part of their contract.

- (i) State what is meant by a complex search.

---



---

KU	PS
	2
	1



6. (b) (continued)

DO NOT  
WRITE  
IN THIS  
MARGIN

- (ii) Describe the steps taken to complete the complex search and produce the format shown.

E-mail Address	Total Cost (£)
tim@gotest.com	35
Pan76@gotest.com	35
Ruby16@gotest.com	25

---

---

---

KU	PS
	3

[Turn over



7. The National Bank of Scotland has branches around the country.

DO NOT  
WRITE  
IN THIS  
MARGIN

(a) A large *client-server network* is used to manage the needs of all its customers.

KU	PS
----	----

(i) State what is meant by the term client.

---

---

1

(ii) State the item of hardware required on each of the bank's computers to enable connection to the client-server network.

---

1

(b) Customers can access their accounts *online*. The bank has to ensure that customers' details are protected from unauthorised access (hacking).

(i) Name the Act that makes hacking an offence.

---

1

(ii) State **one** other illegal activity that is covered by this Act.

---

1

(c) A range of measures are in place to prevent hacking. Customers have a 10-digit user-ID, a password and a PIN that they have to enter each time they log on. When entered, some of these details are validated, while others are verified.

(i) A *validation* check is applied to the user-ID. Suggest a suitable validation check for this data.

---

---

1

(ii) When a customer changes their password, the password undergoes a *verification* process. Suggest a suitable verification check for this data.

---

---

1



7. (c) (continued)

DO NOT  
WRITE  
IN THIS  
MARGIN

(iii) Describe the difference between validation and verification.

---

---

---

---

---

---

---

KU	PS
----	----

2

(d) Customers can download a free application that the bank has created to protect customer passwords and prevent identity theft. This software is only available to the bank's customers.

Identify the type of software that is being described.

Tick (✓) the correct answer.

shareware       commercial       freeware

1

(e) A variety of *management information* is available to bank managers.

State **one** example of such information.

---

---

1

(f) Bank managers in different branches can instantly hold meetings with each other using *video conferencing* rooms.

(i) State **one** other advantage for the company holding its meetings this way.

---

---

1

(ii) State the piece of hardware needed in each video conferencing room to *capture images*.

---

1

[END OF QUESTION PAPER]



DO NOT  
WRITE  
IN THIS  
MARGIN

**ADDITIONAL SPACE FOR ANSWERS**

KU	PS

