General Certificate of Secondary Education
June 2007

**INFORMATION AND COMMUNICATION TECHNOLOGY 3521/H
(SPECIFICATION A) (FULL COURSE)
Higher Tier**

H

AQA
ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Tuesday 22 May 2007   1.30 pm to 3.00 pm

You will need no other materials.
You may use a calculator.

Time allowed: 1 hour 30 minutes

Instructions
- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want marked.

Information
- The maximum mark for this paper is 80.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

3521/H

Answer **all** questions in the spaces provided.

1 An estate agent, who sells and rents houses, is about to install a new computer system.

(a) Which **two** of the following would be the **most useful** input devices for the company?

	Tick **two** boxes only
A monitor	
A mouse	
A scanner	
A modem	
A joystick	
An OMR reader	

(2 marks)

(b) Which **two** of the following would be the **most useful** output devices for the company?

	Tick **two** boxes only
A monitor	
A dot-matrix printer	
A scanner	
A colour laser printer	
A joystick	
A CD-ROM drive	

(2 marks)

(c) The estate agent is going to install a LAN. What does the abbreviation LAN stand for?

....

(1 mark)

(d) Which **two** of the following are advantages to the estate agents of working on a LAN rather than stand-alone machines?

	Tick **two** boxes only
Reduces expensive telephone calls	
Reduces costs as users can share peripherals	
Allows access to the Internet	
Users can share centrally stored files with details of houses	
The estate agent will be able to work at weekends	

(2 marks)

7

2 When new ICT systems are being developed, they need to be tested. The testing stage involves test plans which use typical, extreme and erroneous data. What is meant by each of the following terms?

(a) Testing ....

....

....

(1 mark)

(b) Test Plan ....

....

....

(1 mark)

(c) Typical data ....

....

....

(1 mark)

(d) Extreme data ....

....

....

(1 mark)

(e) Erroneous data ....

....

....

(1 mark)

5

Turn over for the next question

3 A university student uses a PC to help plan a budget for the first term. Their first attempt is shown below.

	A	B	C	D	E
1	**Weekly Budget**				
2					
3	**Income**	**Amount**	**Weeks**	**Income per week**	
4	Student Loan (per term)	£2100.00	12	£175.00	
5	Monthly allowance from parents	£150.00	4	£37.50	
6	Weekly wage from part-time job	£32.00	1	£32.00	
7					
8	**Total Income per week**			£244.50	
9					
10					
11	**Spending**	**Amount**	**Weeks**	**Spending per week**	
12	Rent (paid monthly)	£270.00	4	£67.50	
13	Gas/electric bills (paid monthly)	£50.00	4	£12.50	
14	House bills - food etc (per month)	£250.00	4	£62.50	
15	Books etc for university (per term)	£150.00	12	£12.50	
16	Clothes (per term)	£210.00	12	£17.50	
17	Travel (per term)	£120.00	12	£10.00	
18	Leisure, nights out etc.	£50.00	1	£50.00	
19	Leave in bank for unexpected spending	£100.00	12	£8.33	
20					
21	**Total spending per week**			£240.83	
22					
23	**Money left per week**			£3.67	
24					

(a) Tick **one** box to show which type of software package has been used.

	Tick **one** box only
Graphics	
Database	
Spreadsheet	
Multimedia	

(1 mark)

(b) Which cell contains the spending on rent per week?

....

(1 mark)

(c) Which **one** of the following is the formula used in cell D23?

	Tick **one** box only
=D21–D8	
=D8–D21	
=sum(D2:D12)	

(1 mark)

(d) The cell format in cell A1 is text. What cell format is used in cell C12?

....

(1 mark)

(e) Tick **one** box to show a **disadvantage** of using a software package to help work out the budget rather than using a calculator, pen and paper.

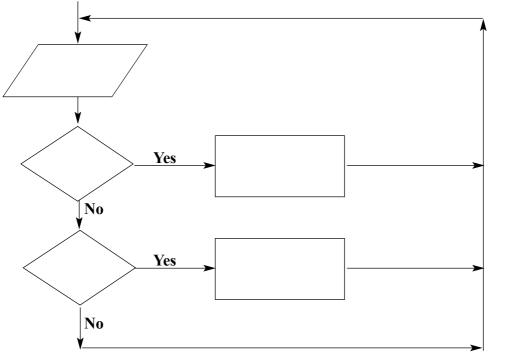|	Tick **one** box only
The formulae could be wrong	
The wrong prices could be input	
A virus may corrupt the information	
Multiple printouts could be produced	

(1 mark)

5

Turn over for the next question

4 An increasing number of supermarket customers are ordering their groceries online.

(a) Complete each of the sentences below.

(i) Ordering groceries online starts with a customer placing an order by

	Tick **one** box only
telephoning the order to the supermarket.	
sending the order by letter to the supermarket.	
sending the order to the supermarket from their PC.	

(1 mark)

(ii) The customer then usually pays for the groceries by

	Tick **one** box only
sending a cheque to the supermarket.	
going to the supermarket and paying by cash.	
the supermarket taking the money from their credit card.	

(1 mark)

(iii) Finally, the customer receives the groceries by

	Tick **one** box only
a van from the supermarket delivering them to their house.	
collecting them from the supermarket at an agreed time.	
collecting them from an agreed pickup point near their house.	

(1 mark)

(b) Give **two** advantages to the **customer** of ordering their groceries online.

Advantage 1 ....

....

Advantage 2 ....

....

(2 marks)

(c) Give **one** disadvantage to the **customer** of ordering their groceries online.

Disadvantage ....

....

(1 mark)

5 A home central heating system uses a monitoring and feedback system to control the temperature of each room in the house.

(a) The system is used to maintain the temperature of the living room at 23°C. Complete the flowchart to show how this system works by writing a letter for each answer in the flowchart boxes below.

A Turn off the heating	**E** Is the temperature greater than 23°C?
B Turn on the heating	**F** Is the temperature less than 23°C?
C Disconnect the heating	**G** Is the temperature equal to 23°C?
D Read the temperature in the room	**H** Print the temperature of the room

(3 marks)

(b) What device would be needed to read the temperature in the room?

....
(1 mark)

(c) Why may the central heating system need such a device in each room?

....
(1 mark)

Question 5 continues on the next page

Turn over ▶

(d) Tick **one** of the following to show how often the temperature of the room should be read.

	Tick **one** box only
Every week	
Every night	
Every hour	
Every minute	

(1 mark)

6

6 A graphic artist specialises in producing the artwork for comics and graphics novels. He uses a PC and a graphics package to produce his images.

(a) Which **two** of the following are important features that you would expect to find in a graphics package?

	Tick **two** boxes only
Calculating the cost of each page of artwork	
Importing images	
Mail-merging letters	
Extensive search facilities	
Freehand drawing	

(2 marks)

(b) The PC came with a keyboard and mouse. Name **one** other input device that would be needed to help with the production of the artwork.

....

(1 mark)

(c) Finished artwork is sent to a publisher for approval. It is sent both as a high resolution colour hardcopy and in digital format.

(i) Name an output device that could be used to produce a suitable hardcopy.

....

(1 mark)

(ii) Describe how the publisher could be sent the artwork in a digital format.

....

....

....

(2 marks)

(d) The graphic artist has recently upgraded the PC and has installed a 300 Gigabyte hard disk. Which **one** of the following explains why such a large hard disk is needed for this application?

	Tick **one** box only
Hard disk are very cheap	
Graphics files are large	
A word processor can also be used	
Colour as well as black and white is used	

(1 mark)

Turn over ▶

7

7 An increasing number of people use e-mail (electronic mail) as a method of communication. For many of these people it is gradually replacing other means of communication such as fax, telephone and post.

(a) Explain what is meant by the term e-mail.

....

....

(1 mark)

(b) (i) Which **one** of the following is an **advantage** of using e-mail compared to using **post**?

	Tick **one** box only
The e-mail will usually arrive quicker than the post	
The e-mail can be sent worldwide	
The e-mail can contain pictures	

(1 mark)

(ii) Give **one** other advantage of using e-mail compared to using **post**.

....

....

(1 mark)

(iii) Give **one** disadvantage of using e-mail compared to using **post**.

....

....

(1 mark)

4

8 A travel company is going to install a computer system for the staff to book holidays online. They need to design a user interface for the holiday booking system.

(a) Which **one** of the following is a type of user interface that could be used for the new system?

	Tick **one** box only
Sensor driven	
Link driven	
Menu driven	

(1 mark)

(b) Which **one** of these factors should be taken into consideration when designing the new user interface?

	Tick **one** box only
Consistency of layout	
Cheap holidays	
The need to take regular breaks	

(1 mark)

(c) Give **two** other factors that should be taken into consideration when designing the new user interface.

Factor 1 ....

....

Factor 2 ....

....

(2 marks)

4

Turn over for the next question

9 A school has decided to store their year 11 examination results on a data handling package. Part of the file they set up is given below.

Pupil name	Registration group	Maths mark (0-100)	English mark (0-100)	Science mark (0-100)
Abbot John	11TB	67	76	70
Afsal Nazir	11BN	64	73	104
Brown Jean	11AS	100	80	87
Carr Susan		37	56	32
Chan Daniel	11GS	48	45	50
Davis Diane	11DG	56	66	62
Dodds Paul	11AS	12	22	11
Doods Gemma	11TB	78		68

(a) There are several mistakes in this information as data validation was not used. Explain what is meant by the term data validation.

....

....

....

(2 marks)

(b) An error has been made in **one** of the Registration group entries.

(i) State what error has been made.

....

....

(1 mark)

(ii) Which **one** of the following methods of data validation would have been the most suitable to use to reduce the possibility of such an error?

	Tick **one** box only
Range check	
Check digit	
Data type check	
Presence check	

(1 mark)

(c)   An error has been made in **one** of the Science mark entries.

   (i)   State what error has been made.

....

....

(1 mark)

   (ii)   Which **one** of the following methods of data validation would have been the most suitable to use to reduce the possibility of such an error?

	Tick **one** box only
Range check	
Check digit	
Data type check	
Presence check	

(1 mark)

(d)   Explain why Pupil name is **not** a suitable key field.

....

....

(1 mark)

7

Turn over for the next question

10 (a) Simulators are used to give ambulance drivers experience of driving an ambulance at high speed.

(i) Which **two** of the following are important reasons why a simulator would be used for this rather than driving on the road?

	Tick **two** boxes only
The driver would not be in any danger using a simulator	
Simulators are widely used throughout the country	
Simulators are also used by the police and the fire brigade	
Road and weather conditions on the simulator can be changed as needed	
The simulator could be used during lunchtime	

(2 marks)

(ii) Simulators use rules built into the controlling software. Which **one** of the following would be a rule that should reasonably be built into this driving simulator?

	Tick **one** box only
All dual carriageway driving must be fast	
Ambulance drivers do not start work until 8 am	
The distance taken to stop will vary with weather conditions	

(1 mark)

(b) Which **one** of the following types of application software is often used for financial modelling?

	Tick **one** box only
Database	
Desktop publishing	
Spreadsheet	

(1 mark)

(c) Applications software can be used for modelling a variety of situations. Explain briefly what is meant by the term **modelling**.

....

....

....

(2 marks)

11 A large chain of newsagent shops has decided to look at the possibility of buying a new computer system to improve the running of its business. The manager has employed an IT consultant to carry out a feasibility study. Part of this feasibility study will involve the IT consultant using interviews, questionnaires or observation to collect information about the existing system.

(a) (i) Which **one** of the following is an **advantage** of using **interviews** rather than **questionnaires** to collect information from the employees?

	Tick **one** box only
Immediate feedback of information	
Employees will never lie in interviews	
Results can be displayed as graphs	

(1 mark)

(ii) Which **one** of the following is a **disadvantage** of using **questionnaires** rather than **interviews** to collect information from the employees?

	Tick **one** box only
Information cannot be put into a database	
Employees always lie in questionnaires	
Questionnaires are often not completed	

(1 mark)

(iii) Give **one advantage** of using **observation** of staff to collect this information.

....

....

(1 mark)

Question 11 continues on the next page

(b) If the newsagent decides to go ahead, Analysis, Design, Implementation, Testing and Evaluation will all be stages in the production of their new information system.
At which stage does each of the following take place?

(i) Planning the layout of the reports that will go to each store.

....

(1 mark)

(ii) Reviewing if the new system meets the performance criteria.

....

(1 mark)

(iii) Comparing the results from the Test Plan with the actual results.

....

(1 mark)

6

12 A video shop stores information about its customers in a database table.
As a data user, the video store must register under the 1998 Data Protection Act.

(a) Tick **three** boxes to show which of the following are responsibilities of the video store as a data user.

	Tick **three** boxes only
Information must not be looked at by the video shop staff	
Information must not be excessive for the purpose	
Information must not be transferred to countries outside the European Union	
Information must not contain the name of the customer	
Information must be changed at the request of the customer	
Information must be obtained fairly/lawfully	

(3 marks)

(b) Part of the customer database table is given below.

ID Number	Surname	First name	House No.	Postcode	Date of Birth
0021	Jones	Jon	6	ZZ23 2KJ	20/11/80
0034	Smith	Anne	78	ZZ20 3GT	12/08/75
0156	Ali	Ahmed	17	ZZ16 1KN	06/02/82
0234	Collins	Sarah	2	ZZ23 4PH	31/01/70
0452	Chan	Michael	113	ZZ12 8PR	15/10/84

(i) How many records are shown in this database table?

Answer ☐

(1 mark)

(ii)   Which is the key field in this database table?

....   *(1 mark)*

(iii)   Which **one** of the following is the best definition of a key field?

	Tick **one** box only
A key field must be the first field in a database table	
A key field must be a combination of letters and numbers	
A key field must be unique in a database table	

(1 mark)

(c)   As well as the customer table, the video store uses two other linked tables. Name **one** other table it would be sensible for them to use.

....
(1 mark)

(d)   Give **one** reason why the video store should link tables together.

....

....
(1 mark)

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8

Turn over for the next question

13 A new computer system has recently been installed into an office. Each member of staff now has a PC on their desk.

(a) Discuss possible health and safety implications of the use of computers in an office.

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(5 marks)

(b)   Describe what steps can be taken to alleviate some of these problems.

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(4 marks)

9

END OF QUESTIONS