

Oxford Cambridge and RSA Examinations
General Certificate of Secondary Education

INFORMATION AND COMMUNICATION TECHNOLOGY A
HIGHER TIER (2359H)
PAPER 3

1994

Specimen Paper 2003

Additional materials:
Candidates answer on the question paper.

TIME 1 hour 15 minutes

Candidate Name

Centre Number

Candidate Number

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INSTRUCTIONS TO CANDIDATES

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer all the questions.
- Write your answers, in blue or black ink, in the spaces provided on the question paper.
- Read each question carefully and make sure you know what you have to do before starting your answer.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is 60.
- You will be awarded marks for the quality of written communication where an answer requires a piece of extended writing.

1 A company uses mail order to sell its goods. A new computerised system is to be introduced.

(a) Describe **two** steps involved in implementing the system.

Step 1 _____

Step 2 _____

[2]

(b) Give **two** items of user documentation which would be supplied with the system.

Item 1 _____

Item 2 _____

[2]

(c) Describe **two** verification methods the company could use when data is entered into the computer.

Method 1 _____

Method 2 _____

[2]

(d) Give **two** reasons why the company uses codes to store data about the goods being sold.

Reason 1 _____

Reason 2 _____

[2]

(e) Describe **two** methods used to ensure that the data is not accidentally lost.

Method 1 _____

Method 2 _____

[2]

2 Tick **two** applications which use real-time processing.

Printing examination certificates.	
Calculating gas bills.	
Central heating system.	
Sending out reminders for overdue books.	
Automatic pilot on an aeroplane.	
Clearing cheques in a bank.	

[2]

3 A mail order electronics company uses a computerised stock control system in its warehouse.

(a) In order to find an item, a six-digit item code number has to be entered into the computer. Give **two** validation checks which could be used on this number.

Check 1 _____

Check 2 _____

[2]

(b) Give **one** reason it is not suitable to store the database on a CD-ROM?

[1]

4 A company has branches all over the world and uses electronic conferencing to communicate with its employees.

(a) Describe electronic conferencing.

[2]

(b) Give **two** benefits to the company and its employees of using electronic conferencing.

Benefit 1 _____

Benefit 2 _____

[2]

5 (a) One example of where an expert system is used is to help doctors diagnose illnesses Give **one** other example of an expert system.

[1]

(b) Describe how the expert system will be used.

[3]

6 An automatic weather station is situated on the roof of a school and is connected to a computer in the classroom. The station has an anemometer to measure the speed of the wind.

Give **two** reasons why it is sensible to collect wind data this way.

Reason 1 _____

Reason 2 _____

[2]

7 A customer pays by Electronic Funds Transfer (EFT) at the checkout of a supermarket.

Give **one** item of data which is stored on the magnetic strip of this card.

[1]

(b) The company is considering using electronic mail to send information to its customers. Describe the process of sending and receiving electronic mail.

[3]

(c) Discuss the relative benefits and drawbacks of using electronic mail to order and pay for goods.

[4]

10 A hospital computer is illegally accessed from a home computer. Describe the damage the hacker could do and the consequences of the illegal access.

[4]



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MARK SCHEME

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Answers

Where there is only one answer given this is the only answer available.

Where a candidate has to choose a number of answers from a given list there should be no more answers than that asked for in the question. If a candidate gives more answers than asked for then every answer over the specified number cancels out one of the correct answers - if there are any.

No trade names are to given credit unless accompanied by a description of what they do eg 'MS Word' would gain no credit but 'the word processor MS Word' would.

- 1 **(a)** Description of two from:
Coding data structures
Design of test data
Training staff
Testing the system
Parallel running
Phased introduction
Direct change over
Transferring data to new system
Any other suitable step. 2
- (b)** Two from:
Purpose of the system
Hardware requirements
Software requirements
How to use the system
Input formats
Output formats
Sample runs
Error messages
Limitations of the system
User guide
Troubleshooting guide
(Not trivial answers like - name, author, date etc) 2
- (c)** Type the data using two different operators and compare the results. 1
Visual check on the typed data. 1

(d) Two from:
Save storage space
Save time when entering data
Save space on documents when printing large lists
Fewer data entry errors
Easier validation
Faster processing
Any other suitable reason. 2

(e) Description of two from:
Backup the regularly
Keep copies of the data on a different site
Keep the data in a fireproof safe
Lock the room where the data is kept
Autosaving
Save under different file names
Undo
Recycle bin
File attributes(0) Hard copy(0) Printing(0)
Any other suitable method. 2

2 Central heating system. 1
Automatic pilot on an aeroplane. 1

3 **(a)** Two from:
Range check.
Existency check.
Check digit.
Check if all the characters are digits.
Check if there are less than six characters entered.
Any other suitable step. 2

(b) One from:
No new items could be added.
No CD-ROM drive (give no credit). 1

4 **(a)** Employees are connected to an on-line system at the same time.
Each member contributes to the conversation by typing their text which appears on everyone else's screen.
Real time images of the people in the conference may appear on the screen like a TV picture.
Hardware - video/microphone/speaker (1 mark for 1 item) 2

(b) Two from:
Companies do not have to transport their employees to a common meeting place.
Instant communication with all employees.
Each employee can contribute equally to the conference.
Cost of travel eliminated.
Time saved because of travelling.
Can work from home.
Any other suitable answer. 2

- 5** (a) One example of an expert system other than medical e.g. car fault diagnosis, prospecting, tax, careers, chess game. 1
- (b) Explanation should include at least 3 of the following:
 Enter problem into the program
 Respond to questions asked by the program.
 Try out suggestions made by the program.
 Tell the program the results of the trials.
 Branch to different routings based on previous results.
 Any other suitable step. 3
- 6** Two from:
 No human intervention so no chance of forgetting to record the weather.
 Can collect weather over very long periods.
 Will take the readings more accurately than a human.
 Can be programmed to display data automatically at regular intervals.
 Data can be automatically stored and used in other programs.
 Safety considerations.
 Any other suitable answer. 2
- 7** One from:
 Id/account number of card holder.
 Issue number.
 Date of issue of the card.
 Date the card expires.
 Sort code. 1
- 8** Points should be made from:
 Research the current situation.
 Analyse the output required.
 Work out what information the new system needs.
 Analyse the processing required.
 Analyse the constraints of the system - cost, time.
 Breakdown the task.
 Estimate the resources required.
 A diagram of the solution (block diagram or system flowchart).
 Design appropriate forms for data capture.
 Design the internal organisation of data.
 Select appropriate hardware.
 Select appropriate software.
 Staff opinions (not students).
 Observation of current system.
 Looking at current documentation.
 Questionnaires.
 Looking at a corresponding system at another school.
 Screen displays. 4

9 (a) Four points from:
Type letters with spaces/Type the document with variables for the data to be inserted (<name>).
Enter the names and addresses into a database (or table).
Start the mailmerge attaching the datafile to the document.
The software automatically replaces the variables with the data from the table. 4

(b) Description:
Message stored on user computer before transmission.
The user sends the message through a modem.
The messages are stored on a central host computer.
The message is transmitted and stored on intermediate computers until it reaches the addressee's computer.
The addressee logs in to a local computer and receives the mail. 3

(c) Benefits
Cheaper than conventional post.
Almost instantaneous.
Know that it has been received immediately.
Can send computer readable data.
Can pay by credit card.
Don't have to leave home.
Any other suitable answer.

Drawbacks
Can't see physical goods.
Data could become corrupted.
Data could be intercepted by another organisation.
Since data is passed from computer to computer and is stored in the process credit card numbers will be stored and are available for potential misuse.
Data could be intercepted, changed, and then passed on.
Messages could be split up into different packets and one does not arrive.
Host machine may not be operational.
Data may be intercepted.
Any other suitable answers up to a maximum of four marks.
At least one benefit or drawback. 4

10 Points from:
Dosages of medicines may be changed resulting in patient death.
Treatment might be changed resulting in patient death.
Patient names might be altered so medicines might be given to the wrong person.
Patient addresses might be altered so that patients cannot be contacted.
Appointment dates could be changed so that treatment is missed.
Any suitable effect.
1 mark for what is changed/deleted. 1 mark for the outcome. 4

11 Four points from:
Robots produce cars to the same standard every time - no individuality.
Human jobs lost due to robots.
Assembly line operators have extremely boring jobs creating frustration.
If the assembly line gets out-of-synchronisation the whole process will collapse.
Robots have to be reprogrammed when there is a small change.
Robots need retraining when a new car model comes out.
Not adaptable.
Capital cost.
Not maintenance costs.
Any other suitable answer. 4

12 Four from:
Tracker balls to control the pointer on the screen for people with limited mobility.
Voice activated input to control the computer if no access to keyboard.
Audio output for blind users because they cannot see the screen.
Touch screens to control input operated by head wand.
Software to predict words in sentences - dyslexia - slow typists.
Foot activated controls for people with no arm movement.
Braille printer for the blind.
Speech recognition system for people who cannot access the keyboard.
Give mark for explanation not for only the device.
Any other suitable answer. 4

13 Points from:
Email
Advantages
Fast communication to anywhere in the world.
Can send large electronic documents very quickly.
Is very cheap - local telephone call rates.
Disadvantages
User must connect to the computer to get the messages.
Not everyone has electronic mail.
Some people worried about security.
Cannot send original material - documents.
Viruses attached to e-mails.

Fax
Advantages
More secure way of sending credit card details.
Data not saved on intermediate computers.
Disadvantages
Paper may not be in the receiving machine.
Not everyone has a fax machine.
Cannot send original material.

Any other suitable answers. 4

- 14** Explanation should include at least 3 of the following:
Gathering data from experts (either books or people).
Design the structure of the database.
Creating a data base of knowledge.
Creating a structure to relate each item in the database.
Verify the data which is input.
Creating an interrogation technique to get at the data.
Designing a method of displaying the results.
Testing the system.
Evaluating the system.
Any other suitable step 3

TOTAL MARK 60

Assessment Grid

Question Number	AO1	AO2	AO3	AO5	AO4	Grade
1a		4.3 [2]				D
1b		4.4 [2]				D
1c			3.3 [2]			D
1d			4.2 [2]			D
1e			3.1 [2]			D
2	3.3 [2]					D
3a				3.3 [2]		D
3b	3.1 [1]					D
4a					3.4 [2]	C
4b					3.4 [2]	C
5a					3.1 [1]	C
5b		3.3 [3]				C
6			3.3 [2]			C
7	3.1 [1]					C
8		4.1/4.2 [4]				C
9a	3.3[4]					B
9b	1.4 [3]					B
9c					3.2 [4]	B
10				3.2 [4]		B
11					3.1 [4]	A
12	3.1 [4]					A
13					3.2/3.3/3.4 [4]	A
14		3.3 [3]				A