

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
General Certificate of Education Advanced Subsidiary Level

INFORMATION AND COMMUNICATIONS
TECHNOLOGY 3838/7838

2513

Structured Practical ICT Tasks

MAY 2005

Issued September 2004
Maximum Mark 120

INSTRUCTIONS TO CANDIDATES

You should attempt all tasks, working independently from other candidates.

There are no time limitations on the tasks other than that they must be submitted by the appropriate internal deadline set by the Candidate's Centre. This deadline will reflect the need for the Centre to complete marking of the tasks and submission of marks to OCR by 15 May 2005.

There are no restrictions on computing facilities, hardware or software, that may be used.

You are strongly advised to keep all your working notes as these may be required by the moderator.

Reasons for answers to tasks are expected to form part of the work submitted.

INFORMATION FOR CANDIDATES

Candidates are reminded of the need for good English and clear presentation in their answers. They will be expected to have used software tools, such as spellcheckers, to help achieve this.

Notice to candidates

- 1** The work which you submit for assessment must be your own.
However, you may:
 - (a)** quote from books or any other sources: if you do, you must state which ones you have used;
 - (b)** receive guidance from someone other than your teacher: if so you must tell your teacher, who will record the nature of the assistance given to you.
- 2** If you copy from someone else or allow another candidate to copy from you, or if you cheat in any other way, **you may be disqualified from at least the subject concerned.**
- 3** When you hand in your coursework for assessment, you will be required to sign that you have understood and followed the coursework and portfolio requirements for the subject.

ALWAYS REMEMBER – YOUR WORK MUST BE YOUR OWN

This question paper consists of 8 printed pages.

Task 1 [Total 28 Marks]**This is a design and software development task.**

A village Junior School is for 8-11 year old children. The school does not at present have a web site on the World Wide Web. The Headteacher would like you to create a web site for the school.

The home page of the web site must include the following:

- logo of the school,
- name of the school,
- contact details for the school,
- name of the head teacher,
- a picture of the school building,
- links to other pages on the web site.

Other pages will include:

- a virtual tour of the school,
- curriculum materials,
- daily times of sessions,
- school calendar,
- news.

Before you create the web site, you will need to design it. A plain white background should be used, so you must include this information in your design specification.

- (a) (i) Produce a design specification for the home page of the web site. [5]
- (ii) Produce a hand drawn design of the home page of the web site. Do not use a computer. [5]
- (iii) Produce a diagram of the directory structure to show how the files (including images) for each page will be stored in separate folders. [4]

The school wants to include a page for parents/guardians to sign up to a mailing list. In order for parents to be included on the mailing list, the school needs to know:

- title, forename and surname of parent/guardian,
- forename and surname of child,
- class child is in,
- parent's/guardian's e-mail address.

- (b) (i) Create and print the home page and sign up to parental mailing list page. You do not need to host your web site on a web server to complete this task. [5]
- (ii) Print evidence of the file names used, the hyperlink(s) (evidence of where they point to) and the folders where files have been stored. [3]

In the future, the school will want to create new pages for the web site.

- (c) Produce a help sheet to show the school how to:
- create a new page,
 - include an image on the new page,
 - create a hyperlink from the home page to the new page. [6]

Task 2 [Total 22 marks]

This is a testing and implementation task. No software development is required.

A presentation has been created to teach 8–9 year old school children the principles of snooker. This presentation and associated files can be viewed at http://www.ocr.org.uk/2513_2005/snookerfiles.

- (a) Complete the test plan in table 2.1 for the presentation showing **seven** tests. Each test should be for a different aspect of the presentation. [7]

Item to test	How to test it	Expected result

Table 2.1

- (b) Produce a help sheet for the school children to show them how to use the presentation. [5]

Some children have been experiencing difficulty reading the words on the buttons and using the mouse to click the buttons. The school has several similar presentations which are also difficult to use. It has been decided to reproduce the presentations using presentation software. The staff at the school are capable of creating a basic presentation.

They would like to know how to add the following features:

- recorded voices to describe each slide,
 - animation so that text and images appear automatically,
 - transitions so that slides progress after a given time interval.
- (c) Produce user documentation to show how a presentation can be edited to run automatically, including transitions, animation, text, images and recorded voices. [10]

Task 3 [Total 23 marks]**This is a software development and testing task.**

A company supplies and fits block paving for driveways. The manager of the company would like a system that will calculate quotations for the customers. He has stated that the system must include:

- an area where he can input details about the customer and the driveway:
 - enter customer name and address,
 - select from a list of types of paving block,
 - select from a hardcore or concrete base,
 - enter the length and width of the driveway in metres;
- a professional looking quotation which must include:
 - logo of business,
 - contact details of business,
 - date of the quotation,
 - customer name and address,
 - area of driveway to be paved (in square metres),
 - type of paving block,
 - total cost of paving blocks required,
 - total price of sand required,
 - type of base (concrete or hardcore),
 - total price of concrete or hardcore required,
 - labour cost,
 - total cost including VAT.

The following calculations are used to prepare a quotation:

- area of driveway = length (m) x width (m),
- number of paving blocks required = (area of driveway ÷ area of paving block) + extra 5%,
- total cost of paving blocks required = number of paving blocks required x cost per paving block,
- quantity of sand required = area of driveway ÷ 20,
- total price of sand required = quantity of sand required x price of sand per tonne,
- total price of concrete or hardcore required = price of concrete or hardcore per square metre x area of driveway to be paved,
- 2 days labour are always required for driveways up to and including 50 square metres, an extra day is required for every extra 40 square metres or part thereof (e.g. 110 square metres would require 4 days labour),
- the number of days labour required are always rounded to the next whole day – only whole days are used in calculations;
- the cost of concrete is £4 per square metre,
- the cost of hardcore is £2 per square metre,
- the cost of each day's labour is £250,
- the cost of sand per tonne is £21;
- the total cost excluding VAT is made up of:
 - total cost of paving blocks required,
 - total cost of sand required,
 - total cost of concrete or hardcore required,
 - total cost of labour required;
- VAT is 17.5%.

The size and cost of paving blocks can be worked out from table 3.1.

Type of Paving Block	Area of Paving Block (sq m)	Cost
Natural Brick	0.02	£0.50
Clay Brick	0.02	£0.75
Yorkstone Cobble	0.08	£0.75
Natural Granite Cobble	0.08	£0.75
Concrete Block	0.01	£0.40
Natural Slabs	0.36	£5.50
Clay Slabs	0.36	£7.50
Yorkstone Slabs	0.36	£7.50

Table 3.1

- (a) Using a spreadsheet, produce a system which will meet the manager's requirements.
- (i) From the spreadsheet created, print an example of a completed quotation for Mrs Serena Smith. Mrs Smith's driveway is 12 metres long and 7 metres wide. She would like Clay Bricks with a concrete base. [4]
 - (ii) Produce a printout of the input screen that the manager will use. [2]
 - (iii) Produce printed evidence of any formulae, functions, macros and/or lookup tables used. [7]

Before the system is used by the manager of the block paving company it needs to be tested. The manager has very little experience of using computers.

- (b) (i) Produce a table of test data (normal, extreme, invalid) using the structure below. You should include **five** different examples of test data of which at least **two** should be invalid. Invalid data must produce an appropriate error message that the manager can understand. [5]

Test Number	Description of Test	Type of Test	Input Data Value	Expected Output Value/Error Message
1				
2				
3				
4				
5				

- (ii) Using the test data above, produce **five** annotated printouts to show evidence of using the test data. At least **two** of these printouts should show different customised error messages that the manager can understand. Annotation should identify the data input and the actual output. [5]

Task 4 [Total 47 marks]

This is a design and software development task.

The Pioneers is a marching display band. In June 2004 there were 20 members of the band. Membership is growing very quickly and they expect to have over 100 members by June 2005. The organisers of the band need a database that will help them to monitor the activities of the band and help with administration.

Each member of the band plays an instrument which they borrow from the band's stock of instruments. A member can only borrow one instrument at a time. Sometimes, band members change to play a different instrument and the organisers need to keep a record of who has used each instrument in the past. Currently a record card is used for each band member. An example of a record card for Patricia Thomas is shown in table 4.1 below.

Name:	<i>Patricia Thomas</i>	Next of Kin:	<i>Mr Daniel Thomas</i>	
Address:	<i>896 Windsor Street Birmingham B21 4BR</i>	Telephone Number:	<i>0777 555 555</i>	
Gender:	<i>Female</i>	Date of Joining:	<i>18 March 1997</i>	
Date of Birth:	<i>14 December 1985</i>			
Instrument Number	Date Loaned	Date Returned	Starting Condition	Ending Condition
<i>21</i>	<i>25-3-97</i>	<i>13-5-99</i>	<i>No bumps, lacquer good</i>	<i>Dent in bell</i>
<i>14</i>	<i>13-5-99</i>	<i>19-8-04</i>	<i>Dent in mouth tube</i>	<i>As start</i>
<i>31</i>	<i>19-8-04</i>		<i>Brand New</i>	

Table 4.1

The band plays at many events each year. Although the organisers of the band would like all members to attend every event, there are always some absences. The organisers keep an attendance register for each event so that they can see who attended. An example is shown in table 4.2.

First Name	Surname	Summer Fete 10-6-04	Regional Contest 11-6-04	Carnival 25-6-04	Fire Brigade Open Day 18-7-04	National Contest 25-7-04
Christopher	Avery	/	/	/	/	/
Mark	Downes	/	O	/	/	/
Juliet	Longbottom	/	/	/	/	/
Poonam	Singh	/	/	/	/	O

Key
/ = present
O = absent

Table 4.2

The organisers of the band have decided to use a database. A set of screens are needed that will allow users to:

- enter details of band members,
- enter details of instruments borrowed by band members,
- register members who have attended an event.

The organisers also need to be able to print:

- a list of members who have borrowed a particular instrument,
- a list of instruments borrowed by a particular member,
- a list of members who have attended each event,
- a list of events attended by each member.

(a) Without using a computer, design a set of screens for this system. These designs must be hand drawn and be annotated to show:

- where data is to be entered,
- checks used for data entry validation,
- buttons used.

Do not implement the design at this stage. It is not necessary to produce designs that show the layout of lists. [8]

One of the tables that will be used in the database is shown in table 4.3.

Entity = ATTENDANCE			
Attribute	Data Type	Key	Validation
Member	Long Integer	Primary (Part) Foreign to MEMBER	Must exist in ID in MEMBER table
Event	Long Integer	Primary (Part) Foreign to EVENT	Must exist in ID in EVENT table
Status	Text (1)		= 'P' or 'A' (P = Present, A = Absent)

Table 4.3

(b) Four other entities are MEMBER, INSTRUMENT, EVENT and LOAN. Using the structure in table 4.3, complete a design for each of these four entities to show:

- the primary key,
- the name of each attribute,
- the data type for each attribute,
- foreign key(s),
- validation that will be used.

[8]

Build the database table structure for the marching display band.

- (c) (i) Produce printouts of the five tables with sample data to show:
- at least 20 MEMBERS,
 - at least 25 INSTRUMENTs,
 - at least 5 EVENTs,
 - the ATTENDANCE data with at least 3 events that have been attended by at least 15 members each
 - at least 30 LOANs. [5]
- (ii) Produce a printout to show the relationships between the five tables. [1]
- (iii) Produce evidence of the five tables showing the attributes, data types and key fields. [4]
- (d) (i) Create and print a single report to show the members who attended each event. Each event should be displayed on a separate page. [2]
- (ii) Print and annotate the query structure you used to create the report in 4 (d) (i) . [1]
- (iii) Produce a report which shows how many events each member has attended. Do not use a separate page for each member. [2]
- (e) Produce a working system with an appropriate user interface for the organisers of the band.
- (i) You should produce screens which match your design in 4 (a) . [2]
- (ii) Produce annotated evidence of four different validation methods used in your system. Printed evidence must show that the validation has been set up as well as printed evidence of it working. [4]
- (iii) The organisers want to produce certificates for band members who attended the National Contest on 25 July 2004. Produce the system to create the certificates. As evidence you should include annotated printouts of:
- the field codes used for the certificate,
 - all queries used in the system,
 - completed certificates for two different members. [4]

Periodically all LOAN records of instruments returned over 3 years ago are deleted.

- (f) Produce annotated evidence of an automated routine that will carry out this task. As evidence you should include:
- button used, annotated to state what it does and evidence of what it is linked to,
 - query structures, macros and/or code used, annotated to state what they do,
 - evidence of messages that appear during the automated routine,
 - evidence of the records before they were deleted, highlighting which ones should be deleted if the routine is successful,
 - evidence of the records which are remaining after the deletion. [6]