

## AS GCE INFORMATION AND COMMUNICATION TECHNOLOGY

G062/01 Structured ICT Tasks

**MAY 2013**

Issued September 2012

Maximum Mark 80



### 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 15th May 2013.
- There are no restrictions on computing facilities, hardware or software that may be used.
- All work produced for the tasks must be kept secure within Centres and not published or distributed externally in any form.
- You **must not** be given, either individually or as a group, any assistance, verbal or written, in the carrying out of the tasks or evidence to produce.
- **Once your tasks have been marked by the Centre, they cannot be re-submitted for improvements.**

### 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 any 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.

- This document consists of **16** pages. Any blank pages are indicated.

## Task 1 Newsletter – Total 13 Marks

The 'Highland Mountaineering Club' (HMC) is a club that organises hill walking, mountaineering and climbing trips for its members. It produces a club newsletter each month with articles about club matters and club trips. The club operates from its offices which are located at The Club House, Nevis View Road, Fort William, IV10 3ST.

### Logo

The HMC would like a logo. The logo will be used for a number of club products. The club's president, Munro Walker, has set out the following requirements for the logo:

- to be created from scratch
- to be a pixel size of 130 pixels high × 130 pixels wide
- to include the club initials HMC in black
- to include a simple motif to represent mountains
- to have a transparent background
- to be stored in a common file format.

(a) Using computer software implement the logo and provide annotated evidence to show how the requirements were met. [3]

### Newsletter Template

The newsletter is going to be based on a template to ensure that consistent layout and presentation are achieved from one edition to the next. The template has the following requirements:

#### *Style*

- The Arial font should be used throughout and three different user-defined styles should be used:
  - HMC\_Title (24pt, black, bold)
  - HMC\_Subtitle (18pt, black, bold)
  - HMC\_Normal (12pt, black)

#### *Content*

- the title for the newsletter is 'Highland Mountaineering Club' (HMC\_Title)
- a subtitle 'Newsletter' (HMC\_Subtitle) must appear underneath the title. This should be prefixed with the month and year automatically when an edition of the newsletter is created from the template
- the club's address and logo should be present
- a photo of the club president, Munro Walker (*Munro.jpeg*), should be included and, next to this, a space for a monthly article from the president
- a table containing spaces for the next five club trips should be present. The table should contain column headings for Destination, Date of Trip, Maximum Spaces, Cost and Notes
- an area for a recent trip article is required and there should be an area for a photo next to it
- each article and the table should have a heading (HMC\_Subtitle).

#### *Formatting*

- page layout should be A4 portrait
- all margins should be set to 1.5 cm
- all article and table text should be in HMC\_Normal style.

- (b) (i) Produce a hand drawn design for the layout of the newsletter template on one side of A4. [1]
- (ii) Create and print the template and produce annotated evidence to show how the requirements for the edition month and year were met. [3]
- (iii) Produce annotated evidence to show how the HMC\_Title style was defined and applied to the newsletter title. [1]
- (iv) Produce annotated evidence to show how the newsletter template was saved as a template. [1]

### Newsletter production

A new edition of the newsletter is required. The information for the trips has been provided in the *trip.txt* file. All other content to fill the spaces within the template will need to be created.

- (c) Using the template you have created, produce and print a copy of the newsletter. [1]

### Membership Mailmerge

To save costs the newsletter is customised and printed only for club members who have requested a printed copy. The data file *members.txt* contains members' personal details. This includes whether or not the member wishes to receive a printed copy of the newsletter. The member's name is to be placed at the bottom right hand side of the newsletter.

- (d) (i) Print annotated evidence to show how the newsletter is linked to the data source. [1]
- (ii) The recipients must be automatically restricted to just those who have requested the newsletter. Print annotated evidence to explain how this was achieved. [1]
- (iii) Print the newsletters that are generated. [1]

## Task 2 Website – Total 19 Marks

The 'Highland Mountaineering Club' would like to develop a web presence to promote their activities to a wider audience.

### Web Banner

Munro Walker, the club's president, would like to have an animated banner for the website. The banner must use the four photos that have been provided: *Dawn.jpeg*, *Plateau.jpeg*, *Ridge.jpeg* and *Summit.jpeg*. The following requirements must be met:

- the banner size will be 1000 pixels wide by 150 pixels high. An area of interest should be cropped from each photo and then resized to 1000 pixels by 150 pixels
  - the banner should be animated so that it cycles through the four images one after the other. The images should appear to fade in and fade out
  - the banner sequence should repeat automatically every 30 seconds
  - the club name should be present and clearly visible throughout
  - the HMC club logo (created in task 1) should be included on the right hand side of the banner.
- (a) (i) Produce a storyboard for the web banner that would allow a third party to implement it. [2]
- (ii) Using computer software implement the banner and provide annotated evidence to show how the requirements were met. [3]
- (iii) The club will want to update the photos in the banner in the future. Produce a help sheet(s) to show Munro how a new photographic image, *Climbing.jpeg*, could be prepared and swapped with an image in the current banner. [3]

### Cascading Style Sheet (CSS) – Website Layout and Appearance

The layout and appearance of the website are to be defined by an external CSS file. The CSS file should meet the following requirements:

- the top of the page should contain a header area 1000 pixels wide by 25 pixels high
  - a banner area 1000 pixels wide by 150 pixels high should appear immediately underneath this
  - under the banner there should be a navigation area 1000 pixels wide by 50 pixels high
  - under the navigation bar there should be an area used for page content that should be 1000 pixels wide
  - the initial background colour for each area is to be black #000000, apart from the main page content area that should be grey #CCCCCC
  - the default font should be Tahoma for all styles. Headings should be set to 24 pixels bold and all other text should be set to font size 14 pixels.
- (b) Implement the external Cascading Style Sheet (CSS) and provide annotated evidence of how the requirements were met. [2]

## Website Implementation

The pages within the site should contain the following content:

- Home page
  - the 'Highland Mountaineering Club' name
  - the club address – The Club House, Nevis View Road, Fort William, IV10 3ST
  - a written introduction to the club's activities
  - a photograph of the club president, Munro Walker (*Munro.jpeg*)
- Gallery page
  - a thumbnail gallery of images of the four photos (*Dawn.jpeg*, *Plateau.jpeg*, *Ridge.jpeg* and *Summit.jpeg*) that can be clicked to then display the full sized image
- Trip page
  - details for the trips that the club is organising in tabular format (*trip.txt*)
  - a trip request form that will allow a club member to submit interest in a trip by filling in the following details: forename, surname, email address, membership number (which must be in the range 1000 to 9999), trip (which must be selectable from a drop down list of trips in ascending date order)
  - a submit button which, when clicked, should email the contents of the form to walkerm@progress\_media.co.uk
- Links page
  - a link to the club newsletter produced in Task 1
  - a link to the weather site [www.mwis.org.uk](http://www.mwis.org.uk).

Each page within the website should:

- use the external CSS definition
  - include the animated banner within the banner area
  - include a completed navigation area that provides links to each of the site's four pages.
- (c) (i) Using a hand drawn diagram, design the structure of the website, showing how all the pages will link together, including external links. [1]
- (ii) Produce the website and provided printed evidence of the pages created. [3]
- (iii) The club wants all photos (*Dawn*, *Plateau*, *Ridge* and *Summit*) watermarked with the club name. Show annotated evidence of how this can be achieved automatically as a single process. [1]
- (iv) Provide annotated evidence to show how the thumbnail gallery works for the image *Ridge.jpeg* [1]
- (v) Produce annotated evidence to explain how the requirements for the trip request form and the submit button were met. [3]

### Task 3 Spreadsheet – Total 24 Marks

Each year the 'Highland Mountaineering Club' offers its members the chance to purchase jackets that have the club's name and logo on them. The club has a deal in place with Pattagucci clothing who have provided a detailed breakdown of their costs (Table 3.1). The club treasurer, Iona Hill, records and processes the orders.

Unit Prices			
Product	Units 1+	Units 12+	Units 20+
Fleece	£17.75	£17.25	£16.95
Hardshell	£44.95	£42.98	£40.00
Softshell	£22.95	£21.55	£20.05
Option 1 – Transfer Art Work Cost			
		Units 1+	Units 20+
Unit Price		£10.50	£ 7.50
Option 2 – Embroidery Art Work Cost			
Machine set-up cost			£35.00
Unit Price			£ 3.50
Packaging Costs			
Bagging per item			£ 0.25
Postage per box (max 12 items)			£ 5.99
Taxes			
VAT Rate			20.00%

**Table 3.1**

Club members may choose from three types of jacket – a Fleece, a Softshell or a Hardshell. The price per unit varies depending upon the number of units ordered.

The club logo should be applied via a transfer process (option 1) or via embroidery (option 2). Embroidery has a fixed machine set-up cost plus a cost per unit. The transfer process has a cost per unit and this becomes cheaper if more units are ordered.

Each item ordered is packaged in a separate bag and there is a cost for this. Goods are then shipped in boxes that may contain up to 12 items, and a charge is made per box.

VAT is added to the total order.

### Costs Worksheet

A *Costs* worksheet needs to be set up to hold the costs given in Table 3.1.

- (a) (i) Print the *Costs* worksheet on one side of A4 ensuring that row and column headings are displayed and provide proof that the worksheet has been named. [1]
- (ii) The worksheet must be protected so that only the costs and the VAT rate can be edited. Print annotated evidence to explain how this was achieved. [1]

### Orders Worksheet

Iona has collated the orders from club members and the data is available in the data file *orders.txt*.

- The order information in the data file *orders.txt* should be imported into a new worksheet called *Orders*.
  - The orders are to be implemented as a named range within the *Orders* worksheet. The named range should be called OrderTable.
  - The header row (forename, surname, gender etc) should remain fixed in position at the top of the worksheet when orders are scrolled through.
  - Filters are required to be set up so that lists based on jacket type can be easily generated eg A list of orders for Fleece jackets.
- (b) Produce printed annotated evidence to show how the requirements were met for the *Orders* worksheet. Print the completed *Orders* worksheet on one page of A4 ensuring that row and column headings are displayed. [4]

### Summary Worksheet – Pivot Table / Chart

A pivot table is required to summarise order totals from the *Orders* worksheet.

- The pivot table is to contain the jacket types in the rows.
  - The pivot table is to contain the colours in the columns.
  - Summary totals for each jacket type and colour should be displayed.
  - The pivot table is to be placed on a new worksheet called *Summary*.
- (c) (i) Print evidence of how the pivot table was implemented to meet the requirements. [1]
- (ii) A graph that is based upon the pivot table is required. The X axis should contain the product type (broken down by colour) and the Y axis should contain the total. The chart areas should be coloured appropriately. Produce and print the chart on one side of A4. [1]

## Quotation Worksheet

Iona would like to generate a detailed model to calculate how much to charge each member. All values and costs should be calculated automatically.

A new worksheet called *Quotation* is required that should be laid out as shown in Table 3.2. The type of artwork (Transfer or Embroidery) should be selectable from a validated list containing the two options. The artwork choice should apply to all jackets ordered.

Once the grand total has been calculated, the spreadsheet should be used to determine the cost to each member for each type of jacket. The cost to members for each jacket type should include bagging, shipping, machine set-up and VAT.

Order Quotation					
Art Work Choice		Embroidery ↓			
Products	Units ordered	Unit Price	Art Work Cost per Unit	Cost per Unit	Product Total
Fleece					
Hardshell					
Softshell					
				Bagging	
				Shipping	
				Machine set-up	
				VAT	
				Grand Total	
			Member Charges	Fleece	
				Hardshell	
				Softshell	

**Table 3.2**

- (d) (i) Print the quotation on one side of A4 with row and column headings when embroidered artwork is selected. [1]
- (ii) Produce annotated evidence to explain the formulae you have used to create the quotation.  
All named ranges should be identified and row and column headings should be present. [6]
- (iii) Provide annotated evidence to show how the Art Work Choice is validated. [1]



## Testing

During the system development a test plan is required.

Test Number	Description	Type of Test	Input Data Value(s)	Expected Output Value(s)
1				
2				
3				

**Table 3.3**

- (e) Complete the test plan in Table 3.3 to show how three different formulae within the system can be tested. [3]

## User Guide

Iona needs a user guide to help her use the system. The user guide should contain:

- instructions for opening the system
- details of how to prepare and print quotations in the future
  - updating costs
  - changing order details
  - selecting artwork
- instructions for using the pivot table to generate different summary data eg fleece jackets only.

- (f) Produce and print a user guide that will meet Iona's requirements. [5]

### Task 4 Relational Database – Total 24 Marks

John Corbett, the membership secretary of the 'Highland Mountaineering Club', would like to commission a database system to maintain the club's records.

Individual membership records are currently paper based. An example is given in Table 4.1.

Personal Details		Fees	
Name	<i>Munro Walker</i>	Subs fees owed	<i>£0.00</i>
Membership Number	<i>1000</i>	Trip fees owed	<i>£0.00</i>
Date of Birth	<i>23/06/1922</i>		
Address	<i>4 Red Drive Burghead Moray IV30 5XX</i>		
Email	<i><u>walkerm@highland.com</u></i>		
Telephone	<i>01343 111999</i>		
Year Joined	<i>1948</i>		
Membership Category	<i>Honorary</i>		
Trips			
Destination	Date	Cost	Paid?
Ben Nevis	21st Jan 2013	£15.00	✓

**Table 4.1**

The club membership category for each member for the current year is calculated on January 1st of the year and is determined by the following rules:

- members that joined over 25 years ago are Honorary members
- members who are under 18 years of age are Junior members
- members who do not qualify as either Honorary or Junior members are Full members.

The club membership category determines the amount of subscription fees (subs) that a club member has to pay for the current year.

#### Database construction

The data files *members.txt*, *membersubs.txt*, *yearlysubs.txt*, *trip.txt* and *membertrips.txt* have been provided. The data should be analysed and used to produce an efficient database structure.

- (a) (i) Print evidence of the field names, data types and keys used for each table within the database. [1]
- (ii) Print evidence of the relationships that have been modelled and ensure that the degree of each relationship is annotated. [1]

## Membership Form

A customised data entry form (based on Table 4.1) is required. The following requirements have been specified:

- the club name and logo (from Task 1) should be present
  - the form should be customised to remove scroll bars and record selectors
  - buttons should be added to allow record navigation
  - all personal membership details for each member should be present
  - the member's membership category should be automatically calculated and displayed
  - a list of the trips that the member has signed up for should be displayed that includes:
    - the destination
    - date
    - cost
    - whether or not it has been paid for
  - if the member owes the club any money, a breakdown of the money owed (for subs and trips) should be displayed.
- (b) (i) Print screenshot evidence of the form created that shows John Corbett's details and provide annotated evidence of how the requirements were met. Any calculations used should be fully explained. **[6]**
- (ii) It has been decided that the email address must have appropriate validation checks implemented to ensure that only correctly formatted email addresses are allowed.

Show annotated evidence to explain how the validation rule that you have implemented for the email field would process the following test data:

- Jane.Walker@xmail.com
- JohnnyWalker@HMC **[2]**

## Report Generation

- (c) (i) A one-sided A4 summary report is required to show the total number of people within each membership category for each year. The total number of club members for each year should also be calculated and included.
- Print the report and provide annotated evidence to explain how the requirements were met. **[3]**
- (ii) A one-sided A4 report is required to show details for members who have fees outstanding. The report should include a breakdown of the total that each member owes for trips and subs and the overall total that the member owes.
- Print the report and provide annotated evidence to explain how the requirements were met. **[3]**

## Yearly Subscription Form

Subscription fees are recorded for each year. The proposed fees for 2013 are given in Table 4.2. A form is required to meet the following requirements:

- the subscription fees for a given year can be viewed or entered
- customised navigation buttons should be added to the form
- a 'Create Subs' button is required on the form to automatically generate the members' subs records for a given year.  
when the button is clicked:
  - a check should be carried out to see if the members' subs records for the given year already exist, and if they do, a customised error message should be displayed (eg if the year 2011 was being viewed and the button was clicked a customised error message would be generated to state that the records already exist)
  - if the members' subs records for the given year do not exist they should be created (eg clicking the 'Create Subs' button in Table 4.2 would lead to the creation of a member's subs record for each member for the year 2013)
  - honorary members should automatically have their subs marked as paid.

Yearly Subscription Fees	
Subscription Year	2013
Full Fee	£45.00
Junior Fee	£10.00
Honorary Fee	£0.00
Buttons to allow record navigation	
<div style="text-align: center; margin: 0 auto; width: 150px; height: 20px; background-color: #e0e0e0; border: 1px solid black;">Create Subs</div>	

**Table 4.2**

- (d) Provide annotated evidence to explain how the requirements were met and print the member subs table after the member subs for 2013 have been generated. **[4]**

## Archive Routine

Members will leave the club at some point and their details should be archived.

- An archive table is required to store each member's name, address, the year they joined and the year they left.
  - An 'Archive' button to automatically run an archive routine for a given member should be added to the membership form.
  - When the 'Archive' button is clicked the member's details should be archived to the archive table and all other details related to the member should be removed from the system.
- (e) Produce annotated evidence to explain how the requirements were met and provide printed evidence of what happens to the data tables when Anne Smith's details are archived. **[4]**







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