APPLIED INFORMATION & COMMUNICATION TECHNOLOGY   **9713/13**

Paper 1 Written A   **May/June 2016**

MARK SCHEME

Maximum Mark: 80

Published

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CAMBRIDGE
International Examinations   **[Turn over**

1 **Six** from: [6]

Font style so that documents are obviously from Vegburger
Font colour so that all text matches the same colour scheme
Use a logo on all documents produced
Email address/website/company address/contact details on all documents produced
Name of company on all documents produced
Positioning of items on the document is the same
Use of footer/headers is the same showing corporate information
Use of footers/headers automatically showing usual information

2 **(a)**

Field Name	Data Type
IngredientName	Alphanumeric
NumberInStock	Integer
Price	Currency
UseBy	Date
InStock	Boolean

Five from: [5]

IngredientName: The items stored will use letters of the alphabet and possibly include numbers in the name
NumberInStock: Will always be a whole number/no decimals involved/will need to do calculations on the field
Price: Will be a numeric value with a currency symbol/ will need to do calculations on the field but result will always need a currency symbol
UseBy: Will always need to be in a date format/to make it easier to identify/can calculate when a product is out of date
InStock: Only two possible answers, Yes or No

(b) Five from: [5]

Relationship/Entity Relationship diagrams are designed
The types of relationship between the tables decided upon…
....one to many, many to one
INGREDIENT and SUPPLIER files are saved as tables in new database
Field with unique data/key field is created …
…and named SupplierID (or similar name)
SupplierID is included in the SUPPLIER table
SupplierID acts as the key field in the SUPPLIER table
SupplierID field must be added to the INGREDIENT table
SupplierID acts as a foreign key in the INGREDIENT table
Relationships are created/tables are linked…
… using key field/SupplierID

3 (a) Four from: **[4]**

Records will be stored in a particular order
They may need to send out orders for all/many ingredients at the same time
File might need to be in sequential order for batch processing of orders
The records will be held sequentially to allow serial access…
…used to process all records one after the other
After an order is received they may need to update the records of many ingredients at the same time
Table of indexes is stored
The index enables direct access...
…needed when accessing individual ingredient records quickly
…when supplier queries order regarding a specific ingredient
…when number in stock of a specific ingredient needs finding

(b) Two from: **[2]**

Serial, where records are processed one at a time
Records stored in chronological order of arrival/Not stored in order of key field/inefficient to re-sort the entire file every time a new value is added to it

4 (a) Three matched pairs from: **[6]**

Sensors used to input values from experiments e.g. temperature sensor when experimenting with hot liquids
Safer than student doing this in hazardous situation/will take readings more regularly/accurately

Touch screen to choose simulation of an experiment/science lesson
More resistant to liquids than a keyboard

Microphone dictate experiment methodology/results
Allows student to record experiment methodology/results while carrying out experiment

Digital cameras to take photo/video of experiments
To include real images in word processed report so do not have to draw experiment equipment

(b) Four from: **[4]**

Have a CO_2 fire extinguisher in the room
Don't overload sockets/make sure there are enough sockets in the room
Use LCD monitors
Have adequate ventilation/don't place computers too close together/make sure ventilation holes are not blocked
Ensure wires are properly insulated
Do not take food and water near to computers
Ensure adequate trunking is in place /Place cables under carpet/use WiFi devices
Cabling should be tied up/organised
Place heavy equipment in middle of work surface/use appropriate support structures on tables/computer equipment must be securely fitted/benching/work desks should be sturdy enough to take the weight of heavy equipment/do not allow heavy equipment to overhang

Only allow qualified electricians to install/regularly check electrical equipment
Equipment should be checked regularly
Electrical equipment must be located away from water supplies

(c) Three matched pairs from: [6]

Data shall be accurate and up to date
So Rose knows that reasonable steps have been taken to ensure the accuracy of the information/can know when her details change these will be recorded

Data shall be processed fairly and lawfully
Data will not be used in ways that have harmful effects on Rose/ data will be handled in ways she would reasonably expect

Data held shall be adequate and relevant for the purpose though not excessive
To protect Rose in that the data held is sufficient for the purpose it is being held for/a greater amount of information than needed for the purpose is not being held

Data will not be kept for longer than necessary
Information that is no longer needed for the purpose is deleted/information if it goes out of date is updated/archived/securely deleted information if it goes out of date

Data will be kept secure
To make sure there is the right physical and technical security/the college is ready to respond to any breach of security swiftly and effectively

Data will be processed for limited purposes
So that data collected for one purpose is not used for any purpose that is not compatible with the original one

Processed in accordance with the individual's rights
So Rose can ask – for a description of the personal data/the reasons it is being processed/whether it will be given to any other organisations or people

Not transferred to countries outside that country unless it has adequate protection for the individual interests of the individual or another person
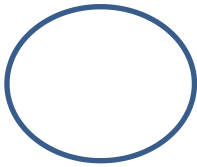So Rose is not exposed to more liberal interpretation of data protection

5 Six from: [6]

Attach files to email messages so that students can send their work
Compress files so that large files like videos of experiments can be sent
Use of anti-virus software to check attachments
Use CC to allow student to send same message to other students
Use BCC to allow a copy to be sent to a teacher without the other members of the group knowing
Use forward to allow work received to be sent on to others
Use groups so that the student could write the name of the group and the message is sent to all in the group/how to send emails to groups/set up groups

6 (a) Five from: **[5]**

Represents the processing of the customer requirements

Invoice

Represents where the customer invoices are output/stored

Order of cream

Represents where the orders are output/stored

Represents the customer <u>making the order</u>

Represents the <u>direction</u> of the flow of data

Diagram represents the flow of data through the Creamclot ordering system

(b) Four matched pairs from: **[8]**

Design of data collection forms/screen layouts…
…so that data is collected accurately

Design of report layouts/screen displays…
…to present information clearly

Design of validation routines…
…to ensure that data entered into the system is sensible

Design of the necessary data and file structures…
…to ensure that data input/output/processing are carried out efficiently

Design the program specification…
…so that the programmer is given guidance to write the software

(c) Four matched pairs from: [8]

Text editor allows typing and editing of plain text…
…can be used to produce html necessary for company website

Database used to store data in an organised way…
… can be used to store data about orders/search for unpaid invoices

Spreadsheet to allow for easy data entry and manipulation of numbers…
…allows calculation of invoices/discounts

Presentation authoring software allows multimedia presentations to be created…
…can be used to create the presentation about cream to be placed on the website

Computer language is used to write software…
…used by programmer to write the programs that will process the orders

System software to control the hardware…
…a printer driver to allow the printers to print invoices/disc operating system to save invoices etc.

Word processing software allows typing, editing and formatting of text…
…to produce orders/invoices for customers

7 (a) (i) Tape only allows records to be read one after the other/serially [1]

(ii) The read/write head can access records in any order [1]

(b) Five from: [5]

Advantages of sequential filing system:
Easier to understand for programmers to write software for
Easier to manage/maintain (the file)

Disadvantages of sequential storage:
Entire file has to be processed
Amendments can be more difficult to make
Transactions might need to be sorted in a particular sequence before processing
Slower to find a particular record
The only way to add new records to a sequential file is to store them at the end of the file

Advantages of random access:
Allows changes to be made more quickly to any record
Faster access of the desired records
Allows worker's queries to be answered more quickly
Payroll system does not require additional hardware whereas sequential access system will require additional tape storage
No sorting of the records is required (only if not given in sequential disadvantage)

Disadvantages of random access:
Data may be accidentally erased or over-written unless special precautions are taken
More expensive as hard disks are needed to store the records

8 (a) Six from: **[6]**

Microprocessor receives data from temperature sensor
Analogue data from the sensor converted to digital using an ADC
Required temperature is entered using touchscreen/number pad/remote control
Microprocessor compares the room temperature with the required temperature
If room temperature is lower/greater than required temperature the microprocessor sends a signal…
…to the actuator
If room temperature is greater than required temperature the microprocessor/actuator switches the fan on/speeds up the fan
If room temperature is lower than required temperature the microprocessor/actuator switches the fan off/slows down the fan

(b) Two from: **[2]**

Different guests will want different/to change temperatures…
…without each room having a separate means of inputting required temperature it's impossible to achieve
Some rooms need to have different temperatures to others…
…work areas like kitchens need lower temperatures
…indoor swimming pool area will need a higher temperature