UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the October/November 2009 question paper for the guidance of teachers

9713 APPLIED ICT

9713/01 Paper 1 (Written A), maximum raw mark 80

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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1 (a) (i) **Two** from:
Batch process control
Raw materials are mixed for a certain length of time
Amount of each ingredient is controlled by computer
Length of time for each stage controlled by computer
Temperature controlled by computer [2]

(ii) **Two** from:
Discrete process control
Like an on/off or stop/start process
The computer control involved in putting mixture into cartons is discrete
In between cartons the robot pauses/stops [2]

(b) **Six** from:
Temperature sensor monitors temperature inside the refrigerator
Contact switch/pressure sensor fitted to the door
(Number pad) to input the required temperature
Data from the sensors converted to digital using an ADC
(Microprocessor) compares temperature data from the sensor with the pre-set value
If the temperature is higher/lower than preset value a signal is sent…
…. to the actuator
(If higher) actuator switches the compressor on
(If lower) actuator switches the compressor off
Digital to analogue conversion required
Microprocessor sends data to LEDs indicating the current refrigerator temperature
Microprocessor compares data from pressure sensor to zero
If it is zero microprocessor sends a signal….
….. to the actuator….
……to switch the buzzer on
Description of PID
Description of PLC [6]

2 **Eight** from (only mark candidate's first **two** methods):
Website - use of the internet
Produced using web authoring software
A cheap form of advertising nationally and internationally
More expensive initially to have own website - web designer has to be employed
Can produce a website to own specification
Website has more features than most other forms
Has range of multimedia - sound, video/ animation,(text, images)
Can have hyperlinks to other sites/pages
Can advertise on other people's websites
Cheaper than using own site
Banners and pop ups can be used
Pop-up grabs user's attention
Can upset users who then do not shop there in future
Users have pop-up blocking software which doesn't allow blockups to appear
Can use pop-unders which are not removed by pop-up blocking
Can advertise their name by getting it included in an online directory

(Multimedia) presentations/slide show - used on purpose-built display monitors…
…placed in strategic locations
The presentation/slide show is produced using presentation software
Has range of multimedia - sound, video/ animation,(text, images)
Other features e.g. slide transition effects, special text effects, image transition
Always on while mall or store is open
The user cannot switch it off
Quicker to update than an Internet site or television commercial

Flyers usually a single-page leaflet
Used by individuals or small businesses
Used to advertise in the local community therefore have limited impact
Can be produced using own PCs and printers and DTP software
For larger print runs have to take to the printers - increased costs
Quick to produce
DTP allows character shapes, variety of patterns, colours

Posters - large printed pieces of paper used to advertise products
Due to size have to be printed by professional printers - expensive
Posters can be produced using word-processing, desktop-publishing or presentation software
More usually, Presentation because of ability to use very large paper sizes

E-mail to customers
Use of attachments may dissuade customers from reading the advertisement
Customers may treat it as junk mail and so not read it
Specific customers can be targeted
Attachment can be created easily using DTP
DTP allows character shapes, variety of patterns, colours
Can be sent to world wide audience
Easy to create an email and mailmerge

A mark is available for a reasoned conclusion
Must have both advantages and disadvantages to gain full marks [8]

3 (a) **Six** from:
Computer/software organises meeting times
The calendar function enables users to keep a record of their appointments and meeting times
Designers have access to public calendar over a network
Public calendar allows designers to see when there would be a suitable time for a meeting
Software provides alerts regarding imminent start of meetings
Calendar advises them of any clashes - meetings scheduled for the same time and date.
(By allocating times for tasks realistically) it is possible to ensure members of a team have equitable workloads
(Software used to) produce Gantt charts for graphically representing progress on website
Gantt charts help to plan out the tasks that are involved in developing the website
Gantt charts are used to plan the whole process including parallel and sequential activities
(Software) provides a critical path method of scheduling
(Software) contributes to the management of such projects by identifying website progress
Providing daily and weekly planning
Some software packages act as a stopwatch device
When a specific task is clicked on, the computer reminds the user how long they have been working on that task
Enables manager to see what emphasis is being placed on each task
Tasks can be arranged so that parallel tasks finish at the same time
Manager can use software to change timings to ensure pages are ready when needed [6]

(b) **Four** from:
Mention at least two of: use of passwords, user ids and memorable words (+1 for expansion)
Description of encryption
Using public keys and private keys
Decryption keys to decrypt data
Use SSL or TLS
Use of drop down menus (to prevent access by keyloggers) [4]

4 (a) **Four** from**:**
Type in or select shop website from favourites
Browse product categories
Browse individual products
Place selected products in shopping basket
Go to the checkout
Enter username and password
Enter billing address
Enter shipping address
Customers who are not previously registered must type in personal details
Choose method of payment
Choose method/speed of delivery
Confirm order
Log off [4]

(b) **Six** from:
Items are usually cheaper as staff costs are lower
Customers can spend time comparing products and prices without being rushed
Can shop at time of their own choice
Can use favourite shop even at a distance
Shops can remember customer's shopping list - don't have to reorder
Don't have to spend time going around different shops/travelling to shop
Disabled people don't have to leave house
Can look at wide range of shops all around the world
Greater choice of manufacturers
No travelling expenses

Security concerns about data transmitted over internet
Description of phishing
Description of pharming
Can order goods and they don't get delivered/are not to the same standard as those ordered
May be hidden costs such as delivery charges
Description of viruses

+1 for reasoned conclusion [6]

5 **(a)** **Four** from:
Computer telephony integration (CTI) software
Is used to integrate all aspects of the system together
Queues calls
Displays caller's number
Directs phone call to operator
Sends commands from the operator's computer to the telephony server
Any computer in the network has the potential to control any phone in the telephone system
Phone calls are processed using interactive voice response (IVR) software
IVR provides automated services
As well being able to queue calls, the system needs to be able to transfer calls to a person with the appropriate expertise [4]

(b) **Six** from:
Increased unemployment for some existing checkout operators
Increased employment for technical staff
Increased employment for programmers
Some checkout operators will have a more menial role
Increased employment for van drivers
Some workers may have to/will have the opportunity to go part time
There will be the opportunity to job share
There will be flexible working hours
Technical staff may be able to work from home
Increased employment for delivery people/despatch staff
Some staff would need retraining [6]

6 (a) **Four** from:
Data flow diagrams
Using (two from:) terminators, processes, flow arrows and stores
Represents inputs, outputs and processing
System flowcharts
Using particular input, output, storage and processing symbols [4]

(b) **Five** from:
Helps identify problems with the current system
Detail of the diagrams will reveal any weaknesses in the current system
Easier to see where there is job duplication
Helps identify suitable hardware and software for a new system
Required outputs, storage and processing requirements identified using DFDs
Helps identify volume of input data
Helps identify the user and information requirements
Can see exactly what job each worker is doing
Can use DFDS to help with user requirements [5]

(c) **Two** from:
Interview users to find out the requirements
Will produce a requirements specification containing information requirements
Information requirements of the system will be identified from the data collected when observing existing system
Will collate interview transcripts, questionnaires and existing documents [2]

7 (a) **Six** from:
Depend on the user requirements
Needs to be easy to use
Needs to be attractive to look at
Needs to limit the potential for inaccurate input
Must have user instructions
Need to consider who will see outputs
Must match customer requirements as well as company
Screen output must be kept simple
Output screens must be consistent so that users are not confused [6]

(b) **Six** from:
(Parallel running)
involves running the old system alongside the new system
Is more expensive because two sets of workers have to be paid
If there is a problem with the new system still have the old system as a backup

(Phased running)
Involves running part of new system whilst old system still operates with other parts
Cheaper as you don't employ two sets of workers
If there is a problem with the new system still have bulk of old system to fall back on

(Pilot running)
Involves running new system in one office whilst old system still operates in other offices
If there is a problem with the new system still have old system in other offices
Problems are limited to one office

(Direct changeover)
Involves replacing the old system with the new system all in one go
Cheaper as you don't have to employ two sets of workers
Quicker as there is no delay waiting for bugs to be fixed
If there is a problem you don't have the old system to fall back on

1 mark for reasoned conclusion [6]

(c) **Four from**:
Indexed sequential method
Each record will have an index
Index will relate to letter of the alphabet
Letter is found
Further index will relate to rough position of record
Records are searched sequentially from that point [4]

(d) **Five** from:
Using test results
Comparisons will have been be made of the actual results with the expected results
If the results are not as expected refinements are made
Obtaining feedback from the user
Could observe users performing set tasks
Interview the users to gather their responses about what they thought of the system and how easy it was to use
Questionnaires to all the workers to ask them how easy they found it to use. The results could be analysed statistically
Identifying limitations of the system
Any extensions to the system users have said they would like
Making improvements to the system
Evaluate results of testing against the requirement specification
Evaluate the results of user testing [5]