

**MARK SCHEME for the May/June 2011 question paper  
for the guidance of teachers**

**9713 APPLIED ICT**

**9713/12**

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) A Valve (1)  
 B Evaporating unit (1)  
 C Compressor (1)  
 D Condensing unit (1) [4]

(b) Five from:

The system controls the amount of heat being let out of the system  
 The valve is controlled by microprocessor to reduce or increase the flow of refrigerant  
 Microprocessor compares the pressure of the refrigerant to the preset value  
 If pressure of refrigerant is above preset value microprocessor opens valve wider  
 If pressure of refrigerant is below preset value microprocessor makes valve opening narrower  
 Touch screen is used to input the required temperature  
 Microprocessor compares the temperature of the room to the preset value  
 If temperature of the room is above the pre-set value the fans remain on/are switched on by the microprocessor or microprocessor increases their speed  
 If temperature of the room is below the pre-set value the fans remain/switched off by the microprocessor [5]

2 (a) Eight from:

*Observation*

Advantage – observing teachers' lessons enables the systems analyst to see the process as a whole

Disadvantage – explanation of the 'Hawthorne effect'

*Interviews*

Advantage – interviewer can move away from their 'script' and ask a more in-depth question if a particular response is given/can interpret body language

Disadvantage – **One** from:

network manager and teachers have to be available at the time the systems analyst wants to interview them/may not have the time/can take a long time to interview all the teachers

interviewees might try and provide answers which they think the interviewer wants to hear

*Questionnaire*

Advantage – **One** from:

can be anonymous and answers tend to be, on the whole, more accurate

everyone can complete the questionnaire at the same time instead of one after the other (as with interviews)/can complete it at their leisure

Disadvantage – it is very difficult to ask further questions based on the response to another question

*Examining documents*

Advantage – helps to identify the inputs and outputs of the system/volume of data can be determined/processing can be deduced

Disadvantage – can take a long time to collate documents [8]

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**(b) Three** matched pairs from:

The required outputs, storage and processing requirements were known using the data flow diagrams

The requirements helped to identify the type of input and output devices

The terminators and flow arrows in the DFD showed the volume of input data

Knowing the volume of input data allowed her to decide on an appropriate method of input to the system

Observing the processes in a lesson gave her an idea about the size and speed of the processor required

Observing the processes gave her an idea of the types of software required

The results of examining documents would be recorded on DFDs

The stores in the DFD show the volume of data in the system

Knowing the volume of data would have helped identify the size and number of storage devices

Terminators and flow arrows out of the system indicate the quantity/format of the output

knowing the volume of output will help to identify an appropriate method of output from the system

User requirements would be known using interview transcripts/completed questionnaires

knowing the user requirements helped to identify appropriate input/output devices/software

[6]

**3 Four** from:

Use of computers as learning resource/teachers can use email to send resources to students/can put them on the school intranet

Does not replace the teacher

Part of an integrated approach to teaching

Learning technology is only part of whole approach

Should be integrated with text books, worksheets

Teacher is still in control/takes responsibility for where learning will go

Students investigate and research using computers

Use of DVDs/interactive whiteboards/(multimedia/overhead) projectors/televisions

Sometimes use overlay keyboards

[4]

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**4 Four from:**

Uses critical path method/Gantt/PERT charts finding optimum time to be spent on individual stages  
 PERT charts specifies the order in which tasks are completed  
 Critical path specifies the order in which tasks must be completed  
 Gantt charts help to show progress of individual tasks  
 Software helps identify progress made in each task  
 Software helps with daily and weekly planning  
 Identifying progress/lack of progress helps with planning future tasks  
 Some tasks can be done in parallel such as developing software and installing hardware, installing network cabling  
 Other tasks must be done in sequence such as installing hardware, installing software, testing network [4]

**5 (a) Five from:**

Access the website  
 Click on My Account/Register here  
 Enter email address  
 Confirm email address by entering it again  
 Enter address/postcode  
 Enter name  
 Enter in contact details  
 Enter your choice of username  
 Enter your choice of password  
 Enter your answer to chosen security question  
 Confirm password by entering it again  
 Activation process completed by receiving email containing link to click on/on screen recognition (i.e. 'type in this selection of characters') [5]

**(b) Three detailed descriptions from:**

Phishing – e-mail appear to be from customer's bank  
 ask for customer's details – password, card/account number, other security details  
 e-mail makes up plausible reason  
 includes a website address for customer to go to which looks just like the actual bank's website but is a fake website

Pharming – fraudster redirects genuine website's traffic to own website  
 customer is now sending personal details to fraudster's website

Spyware is downloaded/software used to gather user's personal details  
 Software detects key presses of user logging on to bank site

Hacking – to access/intercept personal information  
 to use personal information against the individual/to commit fraud  
 hacking to spread viruses [6]

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**6 (a) Two from:**

Offer workers to go part time  
Offer workers job sharing [2]

**(b) Two from:**

More job opportunities  
Can work from home  
Could be retrained [2]

**7 (a) Four from:**

Type of database is chosen (flat file/relational)  
If it is going to be a relational database number of tables is decided upon...  
...a key field to identify each record  
...relationships are designed / Entity relationship diagrams are designed

Type of access is decided on  
If indexed sequential, index is chosen...  
...table of indices designed

Appropriate field names are chosen...  
...relating to data content of field and unique name  
Field type is selected...  
...such as text, number, Boolean  
...appropriate to field contents  
Field lengths are chosen so that space/memory is not wasted but leaves room for expansion

Validation rules...  
...such as range checks, invalid character checks, check digits  
...are chosen appropriate to field contents...  
...error message(s) designed  
Field descriptions are included...  
...which adequately inform about field contents [4]

**(b) Three from:**

Wages so far this year  
Income tax so far this year  
Employer insurance contribution so far this year  
Employee insurance contribution so far this year  
Pay date  
Pension contributions so far this year [3]

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(c) **Five** from:

Batch processing is used  
 At the end of each pay period...  
 ...transaction file is sorted into same order as master file  
 Sorted on employee number  
 First record in the transaction file is read and first record in the old master file is read  
 Computer calculates the pay  
 Using rate of pay from master file  
 Using hours worked from transaction file  
 Computer calculates the income tax/insurance/pension contributions  
 Computer subtracts these from pay  
 Processed record is written to new master file  
 Payslip printed (to file)  
 Process is repeated until end of old master file  
 Master file is updated  
 Payslips are printed

[5]

**8** **Five** from:

A detailed overview of the whole system  
 Data Flow Diagrams/systems flowcharts  
 ... to show the results of systems analysis  
 What is expected of the system  
 Overall design decisions  
 ... to see the choice of hardware and software  
 ... to see the file structure/ input and output formats  
 Test plan and test results to be reused when systems analyst debugs system systems flowcharts  
 Gives an overall view of solution  
 Test data/test plans so that systems analyst can see the results of these/test results.

[5]

**9** **Five** from:

*First-party call control*

Allows operator to have a direct connection between their computer and the phone set.  
 Allows the operator's computer to control the functions of the operator's phone.

*Third-party call control*

Requires a dedicated telephony server to connect the telephone network and the computer network  
 Operator's phone communicates directly with the server  
 The server controls all the phones  
 The server can direct a call to the appropriate operator  
 Any computer in the system can control any phone  
 Supervisors can intervene if the call proves too complex for the operator to handle  
 First party is only suitable for small call centres.

[5]

Third-party call control would be used by Wuhan-Yangtse as it is such a large company/first part control is only used in small scale operations.

[1]

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**10 (a) Three** benefits from:

- Don't have to spend so much on air conditioning/heating/renting offices
- Don't have to pay travelling expenses for conferences (phone conferences will be used)
- Improved motivation
- Retention of key staff

**Three** drawbacks from:

- Difficult to keep track of projects/workers/Issa
- Have to subsidise manager's computers
- Some companies have management systems and cultures that are not (yet) well adapted to the flexibility
- Not all tasks are best performed in a self managing environment/workers might not work as effectively without a manager directly overseeing them [6]

**(b) Four** from:

- Participants agree time and date of the conference
- Issa books phone conference with the phone company for that date
- Issa is given two PINs by the phone company
- A personal PIN, the participants' PIN
- Issa contacts participants and tells them the participant PIN
- Just before the conference Issa dials the phone number keys in his special PIN
- Participants phone the same number
- Participants join the conference by typing in the participant PIN [4]
  
- All participants need a touchtone phone [1]