

**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)

(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 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

(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]