

MARK SCHEME for the October/November 2012 series

9713 APPLIED ICT

9713/33

Paper 3 (Written B), maximum raw mark 80

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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1 (a) (i) **Two** from:

Benefits:

- High(er) bandwidth/faster rate of data transmission compared to copper cable and wireless
- Easier to increase bandwidth
- Expensive to purchase and install
- Very difficult to intercept data being transmitted/very secure as cable has to be tapped into/cut to gain access to data

Drawbacks:

- Difficult to repair breaks/damage compared to copper cable
- Can be easily broken/snapped compared to copper cable

(ii) **Two** from:

Benefits:

- New protocols can increase data transmission rates
- Easy to install no cabling required
- Easy to add a new system
- Not as expensive to purchase/install as fibre optic cables/lower costs than copper cable

Drawbacks:

- Easier to intercept
- Limited range
- Limited users to each access point
- Requires repeaters/hubs over long lengths

(iii) **Two** from:

Benefits:

- New protocols can increase data transmission rates
- Easy to install
- No cabling required
- Easy to add a new system/node/device to network

Drawbacks:

- Easier to intercept data
- Limited range
- Limited number of users to each access point

[6]

(b) **Four** from:

(i) *A Firewall:*

- Scans packet for forbidden key words
- Reads packet sender's IP address
- Permits if on allowed list
- Reads domain of sender
- Permits if not forbidden

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(ii) *A switch:*
reads the IP address of
...recipient's system
Then looks up the port for this system
Then sends the packet directly to this
Blocks/does not send transmission/data to other ports [4]

(c) **Two** from:

Provides secure data transfer
Sends encrypted data
Provides confidentiality
Uses TCP/IP protocol
Through the internet/not a physical network
Uses tunnelling from one LAN to another/VPN client makes tunnel to server
Uses public communication links
Packets are encapsulated within packets of native transmission network [2]

2 (a) **Four** from:

Departure point to show where the train is to be boarded
Destination point to show which trains are available
Date of travel to show when the journey is to be made
Time of travel to show which train to catch
Class of travel to choose the standard of seat to be used
Single or return journey depending on whether the journey was one way or a return to departure point
Number of adults to show how many seats are needed at full price
Number of children to show how many seats are needed at reduced price
Seat reservations to ensure that there is a place to sit/room on the train
Special requirements e.g. accessibility
Contact details/email address to which the confirmation is to be sent [4]

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(b) **Eight** from:

Customer:

Benefits:

- No need to travel/queue/go to booking kiosk, office or agent for tickets to make advance bookings
- Can cost less as there is no need to travel to ticket office, kiosk or agent
- Can be used to make a booking at any time of day
- Tickets can be obtained quicker than using ticket office
- On-line might have special offers as agent/office/company costs are lower
- Can compare prices at leisure

Drawbacks:

- Must be computer literate/have a system e.g. smartphone/have an internet connection
- Cannot ask detailed questions unlike a human
- System might be down- unlike a timetable book – so cannot make a booking at that time/have to wait which can be inconvenient
- Need a credit card to make bookings/collect tickets at departure point

Company:

Benefits

- Requires less office staff so overheads are reduced e.g. smaller booking offices
- Can be quickly updated with latest offers/news
- Better customer satisfaction due to e.g. faster service
- Can hold more information than a human

Drawbacks:

- Expensive to employ programmers/purchase hardware/set up and maintain
- Vulnerable to hacking so is vulnerable to fraud
- Must be kept up to date to provide the correct information
- Less personal touch
- No opportunity to sell extras to customers e.g. seat reservations/travel insurance

[8]

(c) **Three methods** from the following:

Use of HTTPS mode in URL

.....to ensure that data transmitted is encrypted

The use of access rights for users of the servers holding customer data

...which prevents unauthorised users gaining access to the data

...allows use of user IDs/passwords to restrict access

....and use of security questions to authenticate users

Physical restrictions on entry to server system such as guards

Data held on server is encrypted

....to keep it secure

Use anti-malware software regularly

....to reduce e.g. spyware

use a firewall

.....to monitor incoming traffic

Use a digital certificate

....so others know it can be trusted/is the correct site

have warnings on the website

...e.g. "we will never give out your details to others"/"ask for passwords in emails"

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3 One mark for identifying method, one for expansion

CAPI (computer assisted personal interviewing)

- sit in front of computer and answer on screen questions
- interviewer asks questions prompted by computer

CATI (computer assisted telephone interviewing)

- basically call centres used in this technique
- computer dials phone numbers of target audience and then interview takes place using script

CAWI (computer aided web interviewing)

- database of people willing to take part in research
- customer logs on to web site and answers questions
- use pop ups /adverts on selected web sites

Use of person-person interviews and techniques

Research websites of other railway companies

Gathering data from sales terminals

use of computers to prepare documents/interviews

[6]

4 (a) Two from:

The gap between those who have access to ICT and those who do not

The gap between those who have ICT skills and those who do not

[2]

(b) Three ways from:

Low incomes - unable to afford computers/internet

Age - too old to tackle new technology

Inability to participate in e-world

....Such as accessing local information

....Using online resources to vote

....Access to health information

....Unable to obtain job requiring ICT skills

....Unable to shop/bank online

Inability to access online services such as:

....information services

....news services

....independent information suppliers/information from sources other than the government [3]

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5 (a) **Eight** from:
Max six for all benefits or all drawbacks

Benefits from e.g.:

- Better for students with disabilities
- Students can structure own learning
- Can repeat tasks as many times as necessary
- Can work at own pace
- Can be used on a laptop anywhere/no need to be in classroom
- Can be assessed at stages
- And receive results in a short time
- Certificates can be printed by the system rather than waiting
- Questions can progressively become harder depending on test results
- cheaper than regular updates of text books

Drawbacks from e.g.:

- No social interaction with a trainer
- System is unable to answer all questions from students
- Trainees could go off task
- Expensive to create and maintain

[8]

(b) **Six** from:

- Program generates individual test /using question bank
- Students complete multiple choice test
- Using marks on paper/on computer screen
- Sheets fed into scanner/marks read off screen
- Marks totalled
- Report generated and printed /displayed
- Reports emailed to parents
- Software used for processing results/analysing progress

[6]

(c) **Three** from:

- Students could hack into school system and obtain tests/answers to tests
- Students could change test marks on system to get better grades
- Students could alter teachers' reports/gradings to get better references
- Students could pass on student's details to others
- Students could access private information such as medical records
- Students could cyber-bully others
- Students could deface school websites
- Students could send viruses etc to others
- Email addresses harvested used to sell to third parties

[3]

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6 (a) (i) Three from e.g.

- Driving licence
- Passport
- Identity card
- Voting card
- Social security card
- Income Tax form
- Rent book
- Bus pass
- Roadworthiness Certificate
- Vehicle Registration document [3]

(ii) Two from e.g.:

- People can have better access to forms when and where they wish
- Lowers many costs/overheads of offices and officers
- Gives people better image of government
- Less chance of bribery and corruption [2]

(b) Four advantages from:

- Personal details can be stolen from post/from company databases leading to identity theft
- Phishing to acquire e.g. usernames/IDs/passwords by pretending to be a trusted entity to gain access to e.g. bank accounts
- Pharming to redirect user to a bogus/fake/rival website
- Money taken from personal accounts as a result of pharming/phishing
- Tickets intercepted from online booking details
- Loss of bank/credit card details so tickets purchased and intercepted by others
- Skimming of credit cards
- Spyware to steal e.g. login details/account numbers
- Hacking resulting in loss of personal details/logon details/usernames/passwords leading to e.g. theft of money from bank accounts/unauthorised use of credit cards [4]

7 (a) Three from e.g.:

- Incomes
- Allowances/capital allowances
- Expenses such as e.g. sundries [3]

(b) Two from e.g.:

- Money transfer from own online bank account using electronic funds transfer
- Use of a credit/debit card on the government website
- Use of a third party financial transaction service [2]

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8 (a) Two from:

Programmes are created in broadcasting centre and sent to a local transmitter
 Sound and vision sent separately and combined at transmitter station
 Radio/electromagnetic wave signal sent from local transmitter mast
 Received by directional aerial/aerial pointing towards transmitter [2]

(b) Two from:

Programs are sent to a central switching station for encoding/modulating/uplink
 Encryption of signal
 Signals sent to satellite in stationary orbit
 Satellite transcodes signal onto signal for transmitting from transponder
 Satellite sends signals to earth
 Dish on property collects signal
 Decoder transcodes signal so that it can be displayed on the television screen [2]

(c) Four from:

Can carry more channels than a terrestrial system
 Able to access more customers via satellite/only need to have line-of-sight of the satellite
 More revenue possible as can charge for access to services
 Higher perceived quality of service/picture
 Can provide more HD channels as higher bandwidth available
 Can charge for pay-per-view channels/events
 More consistent reception/less susceptible to interference/weather
 Signals not blocked by hills/buildings as much/easily as terrestrial signals
 No need to have multiple transmitters across the country
 No need for distribution network to transmitters
 No need to plan transmitter coverage
 Provides a more detailed Electronic Programme Guide (EPG) for viewers/customers
 Terrestrial transmitters produce a lot of waste heat/power wasted in cooling [4]