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.

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

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE,
GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level
components.
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

(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
(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 pint 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]
(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/collection 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”
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]
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

(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

(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
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

(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

(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

7 (a) Three from e.g.:

Incomes
Allowances/capital allowances
Expenses such as e.g. sundries

(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
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]