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**APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY**

**9713/32**

Paper 3 Written B

**October/November 2016**

MARK SCHEME

Maximum Mark: 80

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**Published**

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 **Eight** from, max 2 per appropriate device, e.g.:

*Network interface card (NIC)*

- ...to connect to network
- ...to construct the data packets for transmission on the network
- ...to receive the data packets from the network
- ...to send the data packets to the network

*Router*

- ...to connect LANs into WAN
- ...to connect network to the internet

*Switch*

- ...to connect network segments together into a LAN
- ...to forward data packets to required segment of network but not all segments
- ...to manage packets by user programming

*Hub*

- ...to connect network segments together into a LAN
- ...to forward data packets to all segments of network
- ...a packet entering any port is forwarded/rebroadcast to all ports

*Wireless access point*

- ...to allow portable devices to connect to the LAN
- ...using Wi-Fi/wireless technology

*Proxy server*

- ...to act as intermediary for services requested by devices on LAN
- ...to enforce an acceptable use policy
- ...to provide language translation of resources accessed from LAN
- ...to act as buffer between LAN and internet for web pages accessed from LAN
- ...to provide network address translation (NAT) services to computers/devices on LAN

*Firewall*

- ...to prevent unauthorised access/network traffic to/from LAN by computers
- ...by inspecting contents of IP/data packets
- ...comparing contents with pre-set rules

*Bridge*

- ...connect two or more LANs together
- ...transfer data between two different protocols
- ...faster than a router at transferring data between networks as no analysis of data is done by bridge.

[8]

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**2 Four descriptions from:**

Connect memory stick to laptop on network  
 ...login to network/server/website with appropriate account/access rights...  
 ...using e.g. FTP  
 ...FTP is a client-server architecture  
 ...using a secure login  
 ...copy/upload files to folder (on website server).

[4]

**3 Two explanations from:**

Use search engine/facility on website to locate the application documents  
 Download/save/open application document  
 Complete and print/submit document  
 Login with user ID and password to Government website account.

[2]

**4 (a) Four descriptions from e.g.:**

Checking balance of account  
 Viewing bank statements  
 Ordering a cheque book  
 Paying bills to e.g. Utility companies  
 Transferring funds to another account/third party  
 Setting up regular payments to third party/another account  
 Viewing pending transactions  
 Updating/changing personal details.

[4]

**(b) Two from e.g.:**

Account holder mobile (cell) phone number looked up and used to send SMS/text message to holder...  
 ...to ensure that transactions originate from account holder  
 ...to alert/call account holder of an irregular/unusual transaction  
 ...when payment made from account  
 ...details of payments/account are changed  
 ...to alert when funds go below/above pre-set values.

[2]

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5 (a) (i) **One from:**

Ensuring that the person is who they say they are  
 Confirming that the item/data is true/genuine.

[1]

(ii) **One from:**

Checking that a person is allowed to do what they are trying to do  
 Assigning access rights/privileges to the person if they are allowed to have them.

[1]

(b) **Six descriptions from:**

Use of user ID with password/PIN known only to user  
 Use of transaction authentication numbers (TAN)  
 ...bank creates tans for customer  
 ...TANs sent to customer/generated by code machine held by customer seeded by PIN or by number on screen/generated by captcha on screen/sent to cell phone of customer  
 ...a TAN is entered after user ID/password/PIN as next level of authentication  
 ...TAN checked against list issued to/held by customer  
 Use of one-time password  
 ...multi-factor authentication with a token  
 ...token holds unique encryption key  
 ...token generates sequence of characters using time/unique encryption key  
 ...bank can work out/reverse-engineer the sequence to check that key is correct one  
 Use of chip & PIN  
 Use of security questions/memorable words  
 Use of biometrics.

[6]

6 **Six from:**

Use of (virtual private network) VPN  
 ....requires login credentials/user ID plus password  
 ...sets up secure tunnel on public communication systems  
 ...use of encryption  
 Use of authorised laptop computer/dongle  
 ...only allow connection if computer authorised/dongle present  
 Access via web page using https  
 ...web interface provided by expert system.

[6]

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**7** *Eight descriptions from e.g.:*

*Sticky keys:*

By pressing two keys together, users can press the alt, control or shift key first, then the character key afterwards

*Filter keys:*

Computer ignores brief key presses/where a key is pressed down repeatedly

*Mouse keys:*

The number pad can be configured to control the pointer on the screen

*Settings:*

To allow the size and appearance of the pointer, icons, text font size, menus etc. to be altered

Text to speech software that speaks the words to help the user

Speech recognition software to enable the user to speak into a microphone, the speech is converted into text and word-processing software is used to display the text

Predictive word processors to try to guess what the user is typing

...after one or two letters are typed in, a choice of words appears on the screen and the user can select the correct word

A mouse that can be configured to have a different type of pointer and/or leave a trail so that people with sight problems can easily pick up where the position of the pointer

*Head pointers:* these use a camera positioned on top of the monitor to detect the movement of the head through the use of reflective materials; software then converts these into the movement of the mouse pointer

*Overlay or concept keyboards:* the overlay can have much larger characters that can be picked out easily by those people with sight problems and can be selected more easily by those with poor motor control

*Purpose-built keyboards:* specially manufactured keyboards, e.g. Braille keyboards for blind people/keyboards with larger keys for those people who can see but not very well

*Tracker balls:* these can be used with either hands or feet

...most disabled people find they are easier to use than a mouse to control menus and pointers

*Joysticks:* can often respond to minor involuntary movements

...these are easier to control than a mouse

*Touch screens:* the idea is similar to the use of concept keyboards in that characters of the keyboard can be larger or images can be used to replace characters

*Head wand:* this is a wand or rod attached to a headband that enables people with limited or no limb movement to press the keys on a keyboard

*Foot mouse:* used by user's feet instead of a hand-held mouse.

*Max 6 for all hardware or all software.*

[8]

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8 **Six** from e.g. :

Coded website with semantically meaningful HTML so visually impaired people can use text-to-speech software and/or text-to-Braille hardware  
Hard-coding of fonts etc. is avoided to allow users to adjust/configure to suit needs  
Textual equivalents provided for images for visually impaired  
Links named meaningfully so easy to understand  
Text and images are large/enlargeable so users with poor sight can read/understand the content  
Flashing effects are omitted/optional so users prone to seizures caused by these effects are not put at risk  
Distracting animations/pop-ups kept to minimum to avoid distracting visually disabled people  
Clickable links and areas are large to help users who cannot precisely control a mouse  
Pages are coded so that users can navigate by use of the keyboard /single switch access device alone so users who cannot use a mouse can access the site  
Links are underlined/coloured, this ensures that colour deficient users will be able to spot them  
Videos are closed captioned/sign language version is available so that hearing impaired users can understand the video.

[6]

9 (a) **Two** from:

Proof-reading/by reading the leaflet carefully to find errors  
...to correct inaccuracies of spelling/grammar/factual accuracy.

[2]

(b) **Four** from:

Spell checker has a built in dictionary  
Spell checker compares every word in leaflet with in-built dictionary  
Spell checker highlights words which it cannot find in the dictionary  
Spell checker suggests alternative spellings  
Spell checker can have words added/amended in the dictionary  
Spell checker can be instructed to ignore incorrect/unusual spellings  
Spell checker can contain technical terms/abbreviations  
If word is spelled correctly spell checker moves to next word.

[4]

10 **Four** from:

All documents from company must have the same look/appearance  
...to present a consistent image to public  
...to present corporate image  
...so company can be recognised by public  
More than one employee can work on the same documents to produce leaflet  
...so that time taken to produce company document is reduced  
...so that number of errors/mistakes/suitable example (e.g. incorrect address) is reduced.

[4]

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**11** *Eight from e.g.:*

*Web-based/online advertising using*

- ....pop-ups on web pages to draw attention of viewer
- ....pop-unders on web pages to draw attention of viewer
- ....adverts on third party websites to attract viewers to own website
- ....adverts on search engine pages to direct viewers to own website
- ....sponsored links on web pages to direct viewers to own website

*Customer-based advertising/social networking advertising*

- ....by inserting adverts into social network streams/timelines/blogs to direct viewers to own website

*Television advertising by*

- ....sponsorship of programmes to attract viewers attention
- ....product placement within programmes to put product in context/in view of watcher
- ....virtual advertisement(s) overlaid using computer graphics into e.g. Sports programmes to put product in view of watcher

*'Infomercials'*

- ....with presenters describing and displaying the product
- ....that give/state telephone number/website details where prospective customers can find more information/sales

*Radio advertising*

- ....by inserting audio/spoken adverts between/in programmes

*Newspaper/magazine advertising*

- ....with printed adverts on pages
- ....by having mini-booklets within magazines.

*Max 5 marks for all descriptions.*

*Additional 3 marks for valid comparisons.*

[8]

**12** *Six from e.g.:*

- Drop down lists offering a choice to respondent
- Radio boxes allowing only one choice to be made
- Text boxes to gather free response answers/comments
- Single character boxes to ensure data entry is appropriate
- Validation rules to ensure that only reasonable data/comments/information is collected
- ....place a limit on number of characters in text boxes/in open-ended answers
- Inclusion of instructions/help/FAQs available to assist in completing the form
- Pop-up boxes to explain questions in more detail
- Multi-lingual options for different languages
- Branching logic to route participants around questions that do not apply to them
- Progress bar so participants can see how far they got in questionnaire
- Automatic survey/questionnaire expiry to set an end date for responses
- ...with re-direct to end-of survey URL/web page
- Integration of answers from previous questions into new specific questions
- Use of real-time survey results can be shown to participants
- ...in the form of a graph displayed at the end of the survey/use of questionnaire

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Can send customised email(s) to participants to remind them/as a ‘thank you’/incomplete questionnaire alert  
 Can send report (for analysis) on survey/use of questionnaire/answers to specific questions to customised list of personnel  
 Can include a ‘forward to’ option so that participants can send the questionnaire link to others  
 Can be set up to prevent multiple responses from same participants  
 Can include an opt-out option so that participants are not repeatedly invited to complete the questionnaire(s).

[6]

**13 Eight from:**

Results are available quicker than paper-based questionnaires  
 ....analysis does not have to wait for transcription into computer system  
 No printing costs/wastage of paper  
 No need to transcribe the results into computer for analysis  
 ....no transcription errors  
 More accurate because data entered directly into computer-system  
 ...data can be exported to statistical software/spreadsheets  
 ...data can be extracted easier  
 Participants can be selected/screened  
 ....can be sent an email/text inviting participants to answer the questionnaire  
 More honest answers from participants  
 ....people answer more honestly when using the internet as they feel more anonymous  
 More flexible because the order of questions can be changed easily  
 Style of questionnaire can be tailored/customised  
 ....images/audio/video can be added to questionnaire  
 Respondent can be asked different questions depending on responses to questions  
 Incentives can be offered for completing the questionnaire  
 ....e.g. Money off next purchase of product.

[8]