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General Certificate of Education
2011

Applied Information and Communication Technology

Assessment Unit A2 13

assessing

Unit 13: Networking and Communications

[A6J71]

FRIDAY 24 JUNE, AFTERNOON

MARK SCHEME

1 **(a)** Start bit
(b) Parity bit
(c) Stop bit
(d) Asynchronous transmission

Each correct answer = 1 × 4 = 4 [4] 4

2 Network card

It behaves as a firewall during data transmission	
It is used during Internet network dial up	
It can cause attenuation in networks	
It is used to connect multiple Ethernet segments	✓
It retimes and resends a signal that has lost part of its strength	✓
It is needed during half duplex data transmission	

Any two correct ticks = 1 × 2 = 2 [2] 2

3 Bus

- Uses terminators
- All computers are connected to the one cable
- Possibility of collisions
- Problems with cable length
- If cable has a fault then no transmission is possible
- Use of repeaters
- Coaxial cable

Star

- Uses hub or switch
- Each computer has own cable
- One cable fault will not bring down the network
- Twisted pair

Any 2 × 2 = 4 [4] 4

4 Hub

- Shares the totals connection speed
- Example 100Mbps hub sharing 10 computers each will have a speed of 100/10 = 10Mbps.
- Hub sends a message to all machines connected to the hub (this is inefficient)

Switch

- Knows the address of each machine connected to it
- Broadcasts a message to a specific computer rather than to all machines connected
- Each machine has access to the full switch data transfer capability (in this example 100Mbps)

Any 4 × 1 = 4 marks [4] 4

5 Network service functions

- Make someone responsible for the network.
- Allocate user names and passwords
- Allocate rights and permissions
- Log (and if possible fix) faults
- Log network usage
- Install software
- Maintain security (anti-virus)
- Any other suitable function

Any 2 × 2 = 4 [4] 4

6 Network operating software

It can be found on the motherboard of a computer	✓
It is used to check a user's password	
It is used to connect computers together on a peer to peer network	✓
It has a special code allocated during manufacture	✓
It is used to send and receive binary data in a network	✓
It was designed to request web pages from a server	

Each correct tick = 1 × 4 [4] 4

7 Labelled Sketch

To include:

- two floors with switch (or hub) on each floor connecting to 15 computers each
- a further switch to connect to a server
- server connects via a router to the Internet
- Printer on each floor connected to the switch

Level of response	Marking criteria	Mark band
Excellent	The candidate describes correctly and in detail the hardware and software required to set up the network. (The candidate has included an accurate labelled diagram) Their use of spelling, punctuation and grammar are excellent and clearly legible. Their discussion of the hardware shows a very good knowledge of the requirements of connecting the computers, the switches, the server, the router and the printers. Their discussion of the set up for connection uses an excellent form and style. Their discussion is highly coherent and is very well organized and they use a wide range of correct specialist terms.	[8–10]
Good	The candidate describes correctly the hardware and software required to set up the networks. (The candidate has included a diagram.) Their use of spelling, punctuation and grammar are satisfactory and clearly legible. Their discussion of the hardware shows some knowledge of the requirements of connecting the computers, the switches, the server, the router and the printers. Their discussion of the set up for connection and Internet uses a satisfactory form and style. Their discussion is coherent and is organized and they use a range of correct specialist terms.	[4–7]
Poor	The candidate may describe some hardware and software required to set up a network. There may not be a diagram. Their use of spelling, punctuation and grammar are poor and is not that legible. Their description may not be well organised. Their discussion of the set up for connection uses a poor form and style. Their discussion is poor and they use few specialist terms.	[1–3]

10

8 Acceptable Use Policy (AUP)

An Acceptable Use Policy defines the way in which the network and the Internet should be used. It applies to all staff and people that use the company's services, wherever use may occur. It should

- take into account all legislation that affects the use of the Internet.
- state the role and responsibilities of the Board of Directors, senior managers, staff and others in relation to use of the Internet
- provide information about how the Internet and how it will be made accessible to all, regardless of age, race, gender, religion, background or disability
- provide a statement about whether or not the Internet (and email) can be used for personal reasons
    - some institutions may allow limited use for these purposes, particularly for staff, and prohibit use for commercial reasons
- provide a statement requiring all users not to access unsuitable material (such as defamatory, obscene, offensive, or indecent material)
- state that unsuitable material is not created, transmitted or stored anywhere at the institution
- provide information about the Computer Misuse Act 1990 (http://www.hmso.gov.act/acts/act1990)
- provide information about the security provided by the ISP
- remind staff about copyright and the disciplinary procedures for any breach or act of plagiarism
- notify staff that all material obtained via the Internet will automatically be checked for viruses
- state that computer equipment at the institution should not be used for accessing other computers or networks illegally or without permission
- inform users that they should not reveal any passwords or other security measures to others
- provide a statement about the penalties that will be incurred if this policy is infringed, such as withdrawal of access rights.
- provide statements about playing games on the Internet
    - the use of chat facilities
    - downloading software
    - default settings
    - web-based email.

Level of response	Marking criteria	Mark band
Excellent	The candidate describes correctly and in detail the contents of an acceptable use policy. Their use of spelling, punctuation and grammar are excellent and clearly legible. Their discussion of each relevant point shows a very good knowledge of the requirements of an acceptable use policy. Their discussion of the set up for connection uses an excellent form and style. Their discussion is highly coherent and is very well organized and they use a wide range of correct specialist terms.	[9–12]
Good	The candidate describes correctly the contents of an acceptable use policy. Their use of spelling, punctuation and grammar are satisfactory and legible. Their discussion of each relevant point shows a knowledge of the requirements of an acceptable use policy. Their discussion is of the set up for connection uses a satisfactory form and style. Their discussion is coherent and is organized and they use a range of correct specialist terms.	[5–8]
Poor	The candidate may describe correctly some contents of an acceptable use policy. Their use of spelling, punctuation and grammar are poor and may not be legible. Their discussion of each relevant point shows a poor knowledge of the requirements of an acceptable use policy. Their discussion of the set up for connection uses a poor form and style. Their discussion is coherent and is not organized and they use few correct specialist terms.	[1–4]

12

9 **(a)** Benefits of e-mail

- Draw up a document and save it as a draft + description
- Compose e-mail + description
- Enter e-mail address of receiver (use of contacts) + description
- Add subject matter detail + description
- Use of distribution lists + description
- Use of cc, bcc + description
- Ask for receipt on delivery or reading + description
- Use of voting buttons + description
- Use of attachments + description
- Cheap method of delivery
- Any other suitable benefit + description

Any 3 × 2 = 6 [6]

(b) protection from SPAM and viruses

- Use of firewall + description
- Use of virus protection + description
- Set up e-mail to filter SPAM
- Ensure virus protection is up to date
- Don't open e-mail from unknown sources + reason
- Don't provide e-mail address to outside sources
- Any other suitable statement plus reason

Any 2 × 2 = 4 [4] 10

10 **Not** firewall features

It uses software to allocate user accounts in a client server network	✓
It stores MAC addresses of all network cards in this network	✓
It is also known as a router	✓
It has software loaded to prevent viruses	
It stores website addresses that may not be viewed by a network user	
It contains the homepage of the company owning the network	✓
It is a security feature that prevents unauthorised entry to a network	

Each correct tick = 1 × 4 [4] 4

11 ISP features

- Allocates bands of IP addresses + description
- Allocates bandwidth connection + description
- Facilitates connection to the internet + description
- Provides statistics of web visits to your site + description
- Manages accounts re. payments from other web presences
- Any other suitable feature

Any 3 features × 2 = 6 [6] 6

12 The discussion will include advantages or disadvantages of some or all of the following areas:

Definition
Mention of the technical details
Type of organization that may use
Cost
Software updates
Interoperability Scalability Adaptable
Data integrity
Affordable
Accessibility
Performance issues
Security
Access rights and permissions
Back up policy
Acceptable Use Policy

Level of response	Marking criteria	Mark band
Excellent	The candidate describes correctly, and in detail, the main advantages and disadvantages of both types of network. Their use of spelling, punctuation and grammar are excellent and clearly legible. Their discussion of each advantage and disadvantage shows a very good knowledge of both types of network. Their discussion uses an excellent form and style. Their discussion is highly coherent and is very well organized and they use a wide range of correct specialist terms.	[9–12]
Good	The candidate describes correctly the advantages and disadvantages of both types of network. Their use of spelling, punctuation and grammar is satisfactory and legible. Their discussion of each advantage and disadvantage shows a satisfactory knowledge of both types of network. Their discussion uses a satisfactory form and style. Their discussion is coherent and is organized and they use a range of correct specialist terms.	[5–8]
Poor	The candidate describes few of the advantages and disadvantages of both types of network. Their use of spelling, punctuation and grammar are poor and their work is not that legible. Their discussion of each advantage and disadvantage shows little knowledge of both types of network. Their discussion uses a poor form and style. Their discussion is coherent and is not very well organized and they use few (if any) correct specialist terms.	[1–4]

12

13

It is an address allocated to network equipment at the point of manufacture	FALSE
It is a physical address	FALSE
It is used because it is impossible to remember the address of all equipment used on the Internet	TRUE
It can be either static or dynamic (supplied)	TRUE
It is also known as a MAC address	FALSE
It identifies network equipment on the Internet	TRUE
Dynamic Host Control Protocol is used for assigning IP addresses.	TRUE
It is a logical address	TRUE
Internet Service Providers can allocate blocks of IP addresses	TRUE
It allows a computer's motherboard to be recognised using a worldwide coding system	FALSE

[10] 10

14 Features of wireless networking

- Signalling by radio (or Bluetooth)
- Frequency can penetrate walls, windows etc.
- Interference possible
- Ease of setup
- Expandability
- Data rates are not as high as wired networks
- Distance can cause inconsistent connections
- Security issues
  - use WPA (preferably not WEP)
  - 'sniffing' and 'war-driving' dangers
- Possible to link wired and wireless

Any 3 features described = 2 × 3 = 6 [6] 6

15

It is a computer that is used to store details of users' passwords.	
It is used when your computer is accessing a web page.	✓
It is a computer that tries to prevent 'war-driving'.	
It is used as a backup computer for the main server.	
It sits between a user's computer and the web server whose pages are being requested.	✓
It speeds up file requests to a web server	✓
It holds an archive of previously requested web pages.	✓
It allocates IP addresses to computer devices.	

Each correct tick = 1 × 4 = 4 [4] 4

16 Videoconferencing

Advantages

- Useful method of face to face communication
- Saves the time and expense of air travel
- Can accompany many of the things a physical meeting can
  - Transfer of files and documents
- Stand alone vc stations is possible

Disadvantages

- Costly to implement (although these may be recovered due to reduced travel)
- Potentially high demand on network infrastructure
- Transmission delays may impact on interaction
- Requires specialist hardware
- Social cues may be less effective
- Time zone set up difficulties

Any 2 advantages plus any 2 disadvantages = (1 × 2) × 2 = 4 [4] 4

Total **100**