



Rewarding Learning

**ADVANCED
General Certificate of Education
2015**

**Applied Information and
Communication Technology**

Assessment Unit A2 13

assessing

Unit 13: Networking and Communications

[A6J71]

TUESDAY 23 JUNE, MORNING

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what the examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The purpose of mark schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents the final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example where there is no absolute correct response – all teachers will be familiar with making such judgements.

1 WIRELESS NETWORK CARD

has a unique web address assigned.	
allows connection to a router.	
can be assigned to a printer.	
has a MAC address.	✓
can send and receive data	✓
is able to access the Internet.	
can be fitted onto a slot of the motherboard of a computer.	✓
is used to store binary code.	

Each correct tick = [1] × 3

[3]

3

2 COMPUTERS IN A NETWORK

(a) Switch (or hub)

[1]

(b) Share resources + reason
 Centralise software + reason
 Easy communication between computers + reason
 Easy to upgrade software = reason
 Cheaper (only limited peripherals to purchase)
 Easier management + reason
 Any valid reason
 Any 2 advantages × [2]

[4]

(c) Hub or switch fails – communication is lost
 Extra cost in purchasing hub or switch, cables
 Extra maintenance needed
 Security issues
 Speed issues
 Any valid reason
 Any 2 disadvantages × [2]

[4]

9

3 ETHERNET PROTOCOL

Features can include

- Cabling
- CSMA/CD
- Error handling
- Movement away from bus based system to star based system
- Speed

Any 3 correct features of Ethernet describe = [2] × 3

[6]

6

AVAILABLE MARKS

4 NETWORKS

In a traditional bus based network coaxial cabling is used.	True
In a star based network the IP address of each node is generated by the MAC protocol.	False
In a client server network each client must have the same CPU.	False
A peer to peer network is the best arrangement for small networks.	True
Wireless networks use 'line of sight' to transmit data from router to node.	False
A switch can be used to transmit data at different speeds to different nodes within a network.	True
A bridge can be used to split a network into two different sections.	True

[7]

5 SECURITY

The discussion of **security** should include the following sections

- Physical threats, i.e. damage to equipment
- Using the network without permission
- Using resources without permission
- Threats based on viruses, Trojans and worms
- DoS

The prevention of each of these threats should also be part of the answer

Level of response	Marking Criteria	Mark band
Excellent	The candidate describes correctly, and in detail, all the issues surrounding security and prevention. Their use of spelling, punctuation and grammar are excellent and clearly legible. Their discussion shows a very wide knowledge of the issues. Their discussion uses an excellent form and style. Their discussion is highly coherent and is very well organized and they use the specialist terms correctly.	[8]–[10]
Good	The candidate describes correctly the issues surrounding security and prevention. Their use of spelling, punctuation and grammar are good and legible. Their discussion shows a good knowledge of the issues. Their discussion uses a good form and style. Their discussion is coherent and is well organized and they use the specialist terms correctly.	[4]–[7]
Poor	The candidate describes few issues surrounding security. Their use of spelling, punctuation and grammar are weak and not very legible. Their discussion shows little knowledge of the issues. Their discussion uses a poor form and style. Their discussion is not coherent and is unorganized and they use few (if any) correct specialist terms.	[1]–[3]

AVAILABLE
MARKS

7

10

6 COMPANY NETWORK

AVAILABLE MARKS

(a) The ADSL router is a device that allows the small network to connect to the Internet. It does this by searching for requested IP addresses on the Internet. [4]

(b) (i) 192.168.1.0 This is a **private IP address** which along with the subnet mask allows a **number of devices to be named** within the subnet.
 (ii) 255.255.255.0 is the **subnet mask for the IP address 192.168.1.0**. This subnet will **allow 254 devices to be named** in the range 1...254 (**0 and 255 are not allowed**). [4]

(c)

The company should set up a wireless access point.	✓
The wireless unit should be placed in a safe place, off site.	
The company should ensure that WPA is enabled.	✓
Users should only be allowed to log on for a limited time.	
The antenna should be placed high and clear of obstructions.	✓

[3]

(d)

It manages all the network cards in the network.	
It allocates IP addresses.	
It prevents access to websites as defined by the owners of the network.	✓
It sets up users permissions on the network.	
It can deter hackers.	✓
It monitors data which enters and leaves the network.	✓
It is a software security feature that prevents an internal network from being breached by unauthorised users.	✓

[4]

15

7 TRACERT

(a) A DHCP server generates an IP address to a device so that the device can be identified (either dynamically or statistically) when travelling over the Internet. [4]

(b) A router is a device that tries to identify the whereabouts of IP addresses either inside a local network or outside a network on the Internet. It does this by using ARP and routing tables. ARP is used to identify the MAC address belonging to the IP address of a device. [4]

(c) At hops 1, 2 and 3 the hops begin with 10 and so they are private IP addresses – they are actual routers on the company network. [2]

(d) address 195.171.149.129 at hop 4 is the router of the ISP. [1]

(e) The timeouts may have occurred at hops 22 and 23 because
 The routers are not responding to the tracing computer because of the fear of DoS attacks (attacks to flood the router with multiple IP addresses in an attempt to cause the router to fall over).

or

The routers are out of operation for some reason [4]

15

8 PROXY SERVER

It is a very important computer.	False
It is used when the original main server fails to boot up.	False
It is a computer that eases the load on web servers.	True
It is used to stop hackers gaining access to an internal network.	False
It prevents SPAM.	False
It sits between your computer and the Web server whose pages you want to see.	True
It checks all the software you are going to use before accessing the Internet.	False
It issues domain names.	False
It helps connect LAN to other LAN on the Internet.	True
It allows roaming profiles to be activated.	False

Each correct answer = [1] × 10

[10]

10

9 VIDEO CONFERENCING

People in different countries do not speak the same language.	
Good video conferencing equipment can be expensive.	✓
Some countries are too far away to allow video conferencing.	
Synchronisation of people and time may be a problem.	✓
Question and answer sessions may be difficult to manage.	✓
Sometimes the signal may be unsteady.	✓
It is difficult to read 'body language'.	✓
The video conference technician may be ill and unable to attend.	

Each correct answer = [1] × 5

[5]

5

AVAILABLE
MARKS

10 The WIRELESS NETWORKING answer should include the following sections

- Bluetooth standards
- Hardware requirements (Access points, WIFI cards)
- Wireless standards
- Security issues
- Range issues

Level of response	Marking Criteria	Mark band
Excellent	<p>The candidate describes correctly, and in detail, all the issues surrounding wireless networking. Their use of spelling, punctuation and grammar are excellent and clearly legible. Their discussion shows a very wide knowledge of the issues. Their discussion uses an excellent form and style. Their discussion is highly coherent and is very well organized and they use all the specialist terms correctly.</p>	[8]–[10]
Good	<p>The candidate describes correctly the issues surrounding wireless networking. Their use of spelling, punctuation and grammar are good and legible. Their discussion shows a good knowledge of the issues. Their discussion uses a good form and style. Their discussion is coherent and is well organized and they use a number of the specialist terms correctly.</p>	[4]–[7]
Poor	<p>The candidate describes few issues surrounding wireless networking. Their use of spelling, punctuation and grammar are weak and not very legible. Their discussion shows little knowledge of the issues. Their discussion uses a poor form and style. Their discussion is not coherent and is unorganized and they use few (if any) correct specialist terms.</p>	[1]–[3]

AVAILABLE MARKS

10

11 CLIENT SERVER. The answer should include

- Client accounts and storage
- Management issues
- Access rights and permissions
- Backup policy
- Roaming profiles
- Software licensing concepts

Level of response	Marking Criteria	Mark band
Excellent	The candidate describes correctly, and in detail, all the issues surrounding client server networks. Their use of spelling, punctuation and grammar are excellent and clearly legible. Their discussion shows a very wide knowledge of the issues. Their discussion uses an excellent form and style. Their discussion is highly coherent and is very well organized and they use all the specialist terms correctly.	[8]–[10]
Good	The candidate describes correctly the issues surrounding client server networking. Their use of spelling, punctuation and grammar are good and legible. Their discussion shows a good knowledge of the issues. Their discussion uses a good form and style. Their discussion is coherent and is well organized and they use a number of the specialist terms correctly.	[4]–[7]
Poor	The candidate describes few issues surrounding client server networking. Their use of spelling, punctuation and grammar are weak and not very legible. Their discussion shows little knowledge of the issues. Their discussion uses a poor form and style. Their discussion is not coherent and is unorganized and they use few (if any) correct specialist terms.	[1]–[3]

Total

10

100

AVAILABLE MARKS