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General Certificate of Education  
2015

Centre Number

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# Applied Information and Communication Technology

Assessment Unit A2 13

*assessing*

Unit 13: Networking and Communications

[A6J71]

TUESDAY 23 JUNE, MORNING



A6J71

## TIME

1 hour 30 minutes.

## INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Answer **all eleven** questions in the space provided.

## INFORMATION FOR CANDIDATES

The total mark for this paper is 100.

Quality of written communication will be assessed in questions **5, 10** and **11**.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

## ADVICE TO CANDIDATES

You are advised to take account of the marks for each part question in allocating the available examination time.

For Examiner's use only			
Question	Marks available	Marks	Remark
1	3		
2	9		
3	6		
4	7		
5	10		
6	15		
7	15		
8	10		
9	5		
10	10		
11	10		
<b>Total</b>	<b>100</b>		

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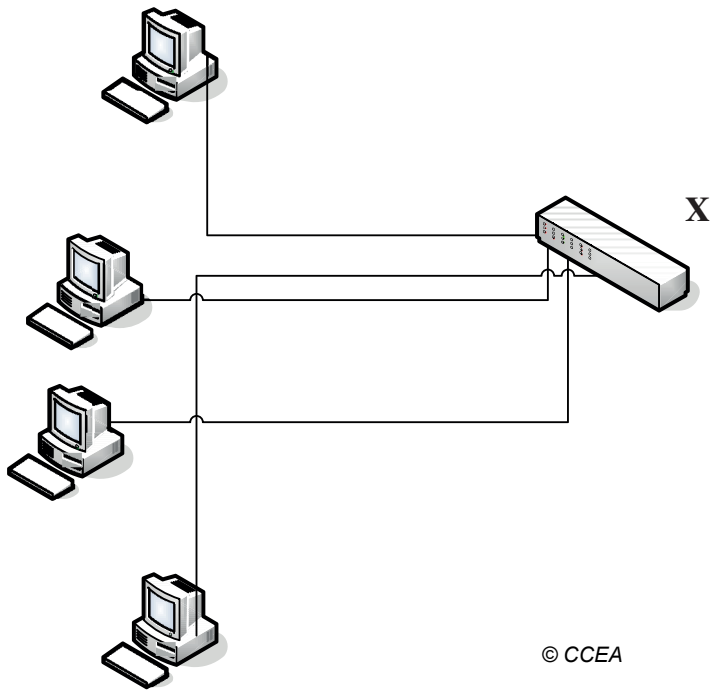
1 By inserting a tick (✓) in the correct boxes below, identify three features of a network card that will complete the statement, ‘A network card.....’

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.	

[3]

Examiner Only	
Marks	Remark

2 Four computers are linked together in a network as shown in the diagram below.



Examiner Only	
Marks	Remark

(a) Name the device labelled X in the diagram.

\_\_\_\_\_ [1]

(b) Describe **two** advantages of having the four computers networked.

Advantage 1: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Advantage 2: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [4]

(c) Describe **two** disadvantages of having the four computers networked.

Disadvantage 1: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Disadvantage 2: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [4]

Examiner Only	
Marks	Remark

3 Describe **three** features associated with the Ethernet protocol.

Feature 1: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Feature 2: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Feature 3: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [6]

Examiner Only	
Marks	Remark

4 The following statements about networks are either true or false. Place the word **true** or **false** beside each statement.

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

[7]

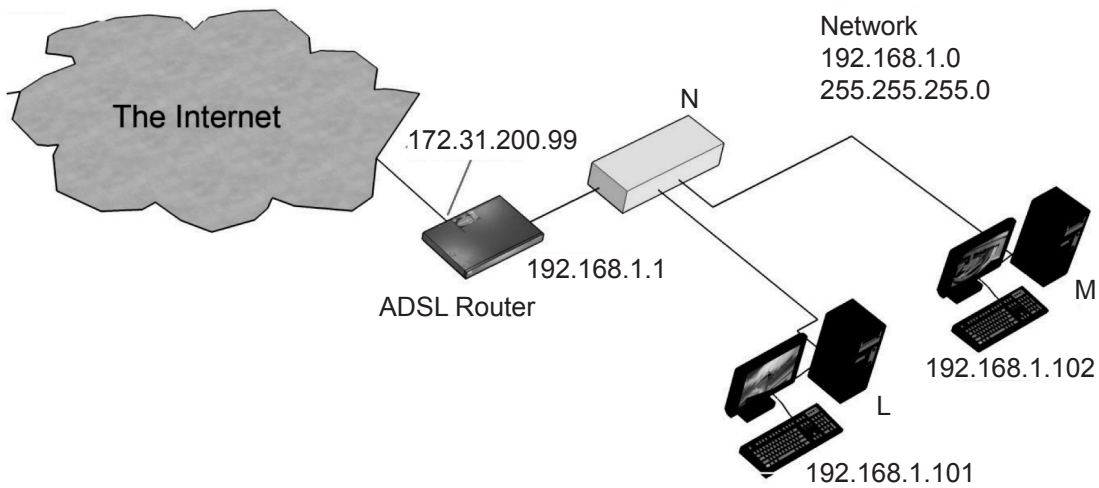
Examiner Only	
Marks	Remark







6 A small company has a network connected to the Internet as shown below.



(a) Explain the purpose of the ADSL router.

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[4]

(b) Explain the meaning of the following IP addresses:

(i) 192.168.1.0 \_\_\_\_\_

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(ii) 255.255.255.0 \_\_\_\_\_

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[4]

Examiner Only	
Marks	Remark

- (c) The company plans to introduce wireless technology to enable mobile devices to connect to its network. Insert a tick (✓) in the table below to identify precautions the company should take to ensure that the signal strength is good.

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) The company plans to install a firewall in its network. Insert a tick (✓) in the table below to identify the features that are associated with a firewall.

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]

Examiner Only

Marks Remark

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7 (a) Explain what is meant by the term **DHCP server**.

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[4]

(b) Explain how a router uses ARP (Address Resolution Protocol).

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[4]

Examiner Only	
Marks	Remark

**Tracert** is a Local Area Network tool used to trace the route of an IP packet on its way from its source to its destination. The output from a typical trace is shown below.

```
U:\>tracert www.apple.com

Tracing route to www.apple.com.akadns.net [17.149.160.10]
over a maximum of 30 hops:

  1      1 ms      2 ms      1 ms    10.9.0.202
  2      8 ms      6 ms      6 ms    10.0.31.5
  3      6 ms      6 ms      6 ms    10.17.1.204
  4      7 ms      6 ms      6 ms    195.171.149.129
  5     19 ms     19 ms     19 ms    62.7.49.45
  6     19 ms     22 ms     19 ms    core2-gig10-1.birmingham.ukcore.bt.net [62.6.196.9]
  7     22 ms     22 ms     22 ms    core2-pos5-1.ealing.ukcore.bt.net [62.6.204.222]
  8     22 ms     23 ms     22 ms    transit2-pos6-0.ealing.ukcore.bt.net
[194.72.17.198]
  9     22 ms     22 ms     22 ms    t2c2-gel3-0-0.uk-eal.eu.bt.net [166.49.168.53]
 10     23 ms     22 ms     22 ms    so-6-0-0-0.gar1.London1.Level3.net [212.113.11.253]
 11     33 ms     33 ms     36 ms    ae-31-55.ebr1.London2.Level3.net [4.68.117.158]
 12     23 ms     34 ms     36 ms    ae-1-100.ebr2.London2.Level3.net [4.69.132.122]
 13     30 ms     36 ms     35 ms    ae-2.ebr1.London1.Level3.net [4.69.132.146]
 14     32 ms     35 ms     40 ms    ae-1-100.ebr2.London1.Level3.net [4.69.132.118]
 15     93 ms    108 ms    106 ms    ae-4.ebr1.NewYork1.Level3.net [4.69.132.109]
 16    104 ms    106 ms     97 ms    ae-1-100.ebr2.NewYork1.Level3.net [4.69.132.26]
 17    114 ms    122 ms    126 ms    ae-2.ebr1.Chicago1.Level3.net [4.69.132.65]
 18    143 ms    144 ms    144 ms    ae-3.ebr2.Denver1.Level3.net [4.69.132.61]
 19    138 ms    144 ms    138 ms    ae-1-100.ebr1.Denver1.Level3.net [4.69.132.37]
 20    178 ms    181 ms    180 ms    ae-3.ebr2.SanJose1.Level3.net [4.69.132.57]
 21    168 ms    168 ms    167 ms    ae-24-54.car4.SanJose1.Level3.net [4.68.123.110]
 22      *        *        *        Request timed out.
 23      *        *        *        Request timed out.
 24      *        *        *        APPLE-COMPU.car4.SanJose1.Level3.net [4.71.114.34] reports: Desti
nation net unreachable.

Trace complete.

U:\>
```

(c) Explain what is happening at hops 1, 2 and 3 in the route trace.

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[2]

(d) At hop 4 what can be deduced about address 195.171.149.129?

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[1]

(e) Explain why the message 'Request timed out' occurred at hops 22 and 23.

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[4]

Examiner Only	
Marks	Remark

- 8 The following statements about a proxy server are either true or false. Place the word **true** or **false** beside each statement.

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

[10]

Examiner Only	
Marks	Remark



- 9 Increasing cost of air travel has meant that some companies are making more use of video conferencing. There are some difficulties associated with this method of communication. Insert a (✓) in the table below to identify the types of difficulty you might meet during a video conferencing session.

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 conferencing technician may be ill and unable to attend.	

[5]

Examiner Only	
Marks	Remark

10 Traditional local area networks rely on the installation of cabling and network points. Data transmission is also possible using wireless technology. Discuss the main features of installing and using a wireless network. Your discussion should include the following sections:

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

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Examiner Only	
Marks	Remark



11 Discuss the advantages and disadvantages of using a client server approach to network topology. Your discussion should make reference to:

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

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Marks	Remark



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**THIS IS THE END OF THE QUESTION PAPER**

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