OCR
Oxford Cambridge and RSA

Wednesday 22 June 2016 – Morning

A2 GCE

APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY

G055/01 Networking Solutions

Candidates answer on the Question Paper.

OCR supplied materials:
* Instructions for Candidates G055/01/IC (inserted)

Other materials required:
* Candidate's pre-prepared materials

Duration: 1 hour 30 minutes

Candidate forename		Candidate surname	

Centre number						Candidate number					

INSTRUCTIONS TO CANDIDATES

* The Insert will be found inside this document.
* Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
* Use black ink. HB pencil may be used for graphs and diagrams only.
* Answer **all** the questions.
* Read each question carefully. Make sure you know what you have to do before starting your answer.
* Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
* Attach your pre-prepared materials for tasks 1–3.
* Do **not** write in the bar codes.

For Examiner's Use		Max
Task 2		21
Task 3		9
1		7
2		6
3		6
4		5
5		9
6		4
7		6
8		7
9		11
10		9
Total		100

INFORMATION FOR CANDIDATES

* The number of marks is given in brackets **[ ]** at the end of each question or part question.
* The total number of marks for this paper is **100**.
* No marks will be given for using brand names of software packages or hardware.
* The quality of your written communication will be assessed through Q5 and Q10.
* This document consists of **12** pages. Any blank pages are indicated.

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3

Answer **all** the questions.

SECTION A

These questions refer to the GreenFish case study.

1   All devices connecting to the GreenFish network will have access to a shared broadband connection.

(a) Describe **two** advantages to GreenFish of having a shared connection rather than a number of separate connections.

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(b) Explain **one** disadvantage to the employees of GreenFish of sharing one internet connection.

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.... **[3]**

2 All employees using the GreenFish network will be able to access the internet. This will allow employees to access a range of WAN services, mostly browser-based.

Identify and describe **two** services that will be used by GreenFish employees through their browser software. Give an example of how each service would be used by a GreenFish employee.

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[6]

3 Identify **two** types of network software needed for the GreenFish network and explain why each is required.

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4   The graphic designers working at GreenFish will use images provided by their clients and may add images of their own. These are subject to copyright law.

   (a) Describe **one** security procedure GreenFish could use in an attempt to ensure copyright law is observed by its employees.

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   .... **[2]**

   (b) Explain how the network can be secured to help protect images from data theft.

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5   On the proposed peer-to-peer network, the graphic designers will share large image files on the Network Attached Storage (NAS) device. The printer will be network-ready and will be connected directly to the network switch.

The GreenFish network could, alternatively, be set up as a client-server network with a file server in place of the NAS and a print server in place of the network-ready printer.

Evaluate the choice of a peer-to-peer network for GreenFish rather than a client-server network.

Marks will be awarded for the quality of written communication in your answer.

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6 The GreenFish network will have one shared broadband connection to the company's Internet Service Provider (ISP). To get the fastest broadband speeds available (76Mbps), GreenFish will need to pay up to 50% more for its broadband than if it pays for a 38Mbps broadband speed.

(a) A 38MB image file will take around 8 seconds to download at a speed of 38Mbps.

How long will a 38MB image file take to download at the fastest (76Mbps) speed?

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.... **[1]**

(b) (i) Explain the characteristics of fibre optic transmission media that enable the provision of fast broadband speeds.

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.... **[2]**

(ii) Give **one** benefit of fast broadband speeds to the GreenFish network.

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.... **[1]**

7 (i) Recommend the most suitable transmission media and connectors for the wired network at GreenFish.

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(ii) Explain **two** reasons why this combination of transmission media and connectors is the most suitable.

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Turn over

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8 The GreenFish network will use private addresses for all devices on its network in the address range 192.168.2.2–192.168.2.254. The network address will be 192.168.2.0.

(a) What is the maximum number of individual IP addresses in this address range that GreenFish could potentially use on its network?

.... **[1]**

(b) The addresses of two devices and the network, written in binary, are shown in **Table 1** below.

Fill in the missing binary version of the subnet mask.

	Decimal version of IP address	**Binary version of IP address**
Device 1 address	192.168.2.2	11000000 10101000 00000010 00000010
Device 2 address	192.168.2.254	11000000 10101000 00000010 11111110
Network address	192.168.2.0	11000000 10101000 00000010 00000000
Subnet mask	255.255.255.0	

[1]

Table 1

(c) Explain how the subnet mask is used to find the network address from the IP address of any device on the GreenFish network.

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SECTION B

You do not need the case study or your tasks to answer these questions.

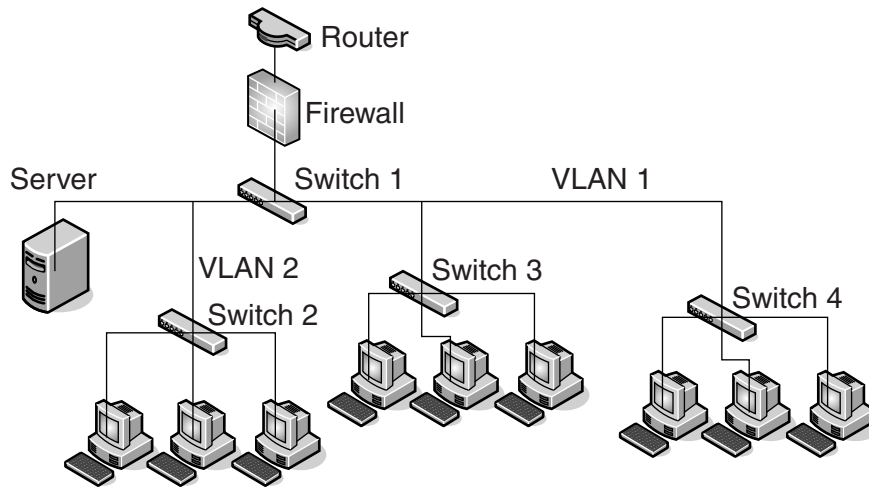**Fig. 2**

9 Refer to **Fig. 2**.

Networks can be connected together in different ways.

(a) Identify the topology of this network.

.... **[1]**

(b) The server shown in this network acts as a proxy server and as a web server hosting an extranet.

(i) Explain the purpose of a proxy server in this network.

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(ii) Describe the purpose of an extranet in this network.

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(c) This network has two Virtual Local Area Networks (VLAN1 and VLAN2).

(i) Describe what a VLAN is.

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(ii) Explain why VLANs might be used in this network.

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10 When two or more computers are connected together they need an agreed way of communicating with each other through the transmission media that connects them.

Protocols define the way data is transferred between the devices in the network.

Discuss the protocols that might be in use at lower network levels. You must include a description of the rules that are defined by each protocol.

Marks will be awarded for the quality of written communication in your answer.

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END OF QUESTION PAPER

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