WJEC CBAC

GCE A level

1647/01

APPLIED INFORMATION & COMMUNICATION TECHNOLOGY

UNIT AICT 7
e Connect Networking Principles, Design and Management

A.M. FRIDAY, 21 January 2011

3 hour examination consisting of two parts

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

INFORMATION FOR CANDIDATES

Questions in this paper are based on the context of *Mynydd Bach Outdoor Adventures*.

The exam consists of two parts:

Time allowed for Part A: 1 hour

- The Tender (40 marks)

Time allowed for Part B: 2 hours

- The Implementation (40 marks)
- The Recommendation (20 marks)

A short break is permitted between parts A and B.

Quality of Written Communication will be assessed in the response to Question 8.

INTRODUCTION

Mynydd Bach Outdoor Adventures

INVITATION TO TENDER

As an IT consultant specialising in network solutions, you have been invited to tender for the contract we are offering to update and improve our digital communication systems.

Mynydd Bach Outdoor Adventures facilities include:

- Main Reception

- Catered and self-catering accommodation

- Camp site

- Dry ski slope with Ski Office

- Paintball area with Command Centre

The dry ski slope and the paintball area can be used by guests staying at Mynydd Bach Outdoor Adventures and by day visitors.

The Main Reception, Ski Office and Command Centre have separate IT systems which are not connected to each other.

Before we can consider your tender we require you to demonstrate your subject expertise by completing a number of tasks.

Skiing on the dry slope

Paintballing

"Hello, I am the manager here at Mynydd Bach Outdoor Adventures. I understand that there are many advantages of using networked computers and I would like you to clarify some of these advantages with practical examples."

1.   Describe, giving an example, how using networked computers compared with stand alone can facilitate:

(a)   efficient use of hardware   [1]

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(b)   security of data   [1]

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(c)   monitoring of users   [1]

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(d)   collaborative working   [2]

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Turn over.

"Hello again, I appreciate that the choice of hardware to be used in a computer network is important and I would like your advice on the hardware that we might require for our network."

2. Networks can be connected using a variety of media such as Unshielded Twisted Pair (UTP), Shielded Twisted pair (STP) and fibre optic cable.

   (a) Briefly describe the physical difference between UTP and STP cables. [1]

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   ....

   (b) Describe one advantage and one disadvantage of using STP as compared with UTP. [2]

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   (c) Describe advantages of using fibre optic cables as compared with UTP or STP. [3]

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*"Hello again, I appreciate that the choice of
hardware to be used in a computer network is
important and I would like your advice on the
hardware that we might require for our network."*

3. Explain the function of the following hardware devices, giving a suitable example of the use
of **each**:

(a) Repeater [2]

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....

(b) Wireless Access Point [2]

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(c) Media Converter [2]

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"I understand that we will require servers for our network and would like you to provude more information about each type of server."

4. Briefly describe the role of the following servers, including at least one specific facility that each provides:

    (a) Internet (proxy) server   [2]

    ....

    ....

    ....

    ....

    (b) mail server   [2]

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FROM: The Manager

TO: Candidate

SENT: Today

SUBJECT: Virtual Networks

I am not sure whether we will require a virtual network and would like to know a little more about them.
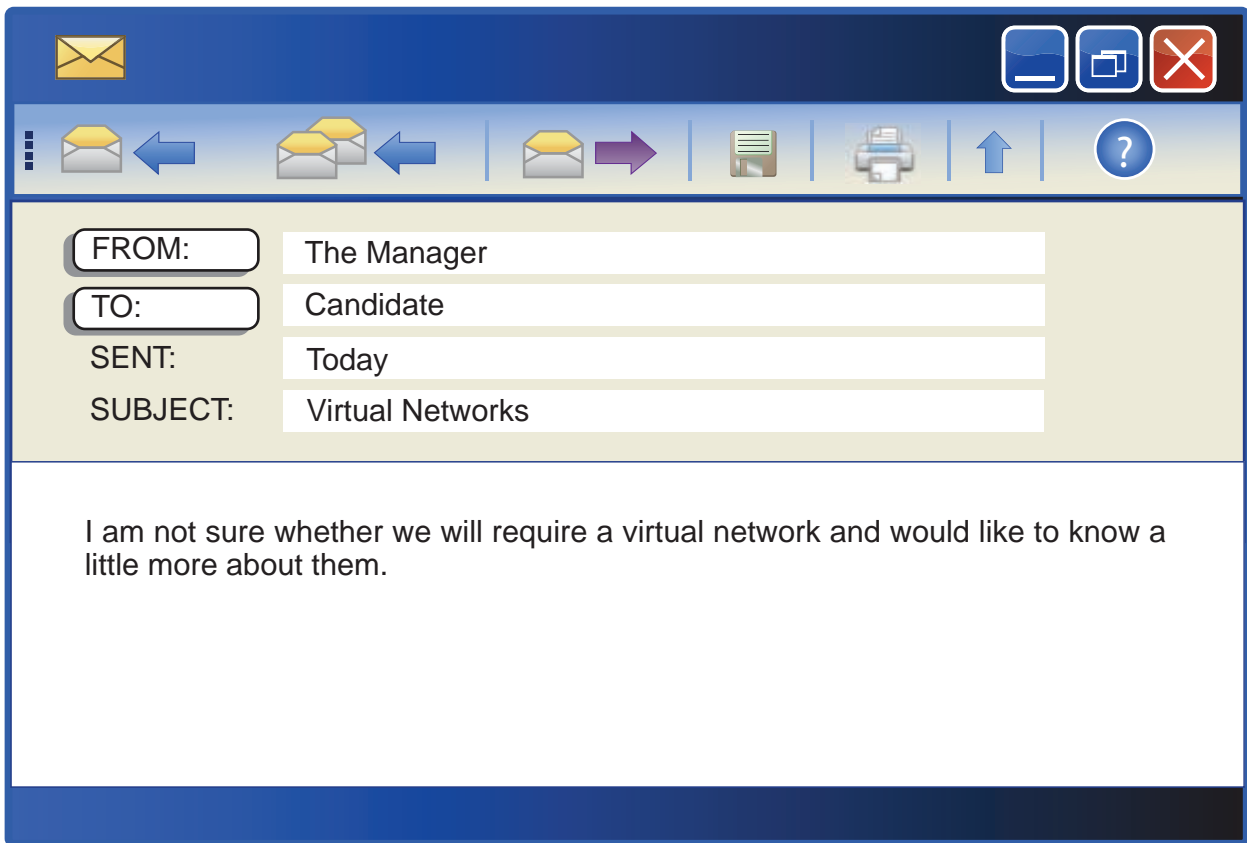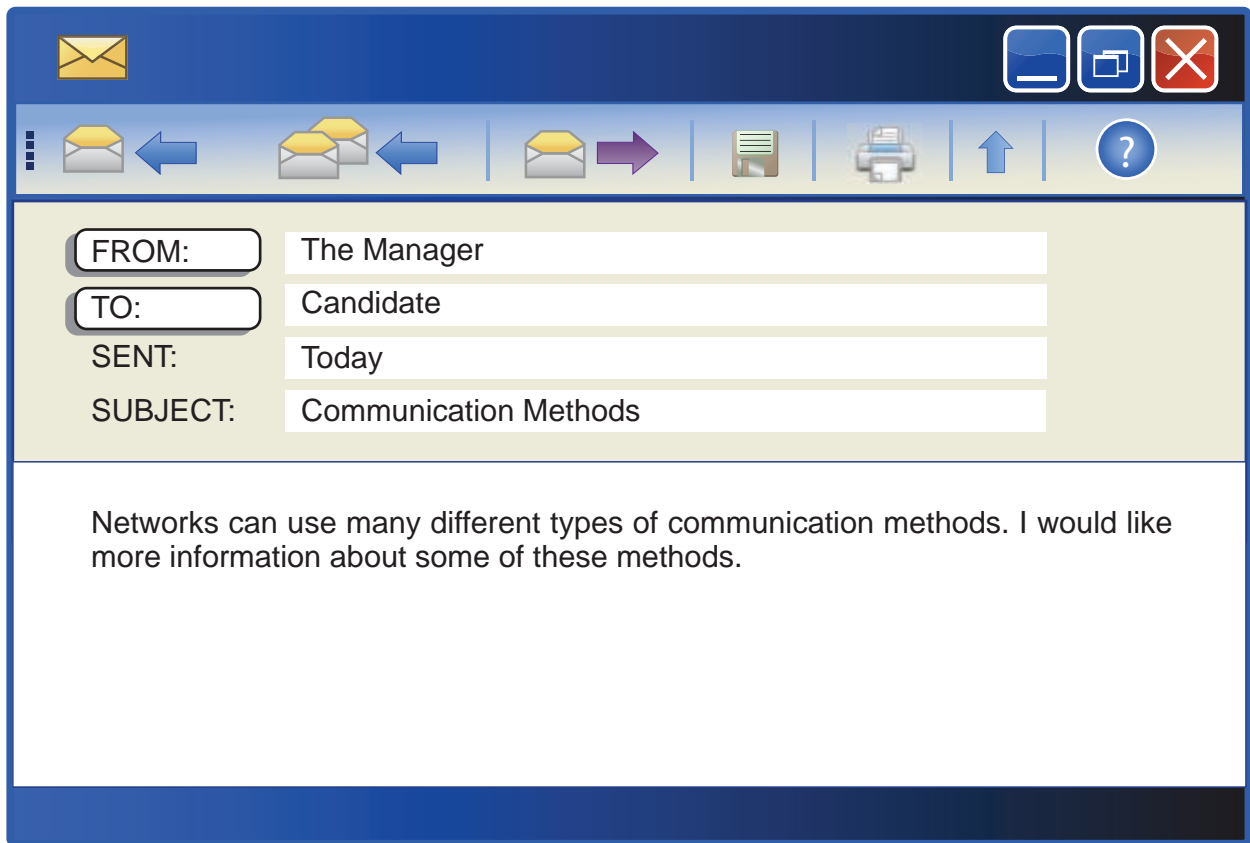
5. *(a)* A Virtual Local Area Network (VLAN) offers higher performance for large Local Area Networks (LAN) because it limits broadcasts. Briefly describe **one** other characteristic of a VLAN. [1]

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(b) A Virtual Private Network (VPN) can use a public network to allow a remote computer to securely communicate with a LAN. Briefly describe the process carried out by the computer and by the LAN to ensure this communication is kept secure. [2]

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Turn over.

FROM: The Manager

TO: Candidate

SENT: Today

SUBJECT: Communication Methods

Networks can use many different types of communication methods. I would like more information about some of these methods.

6. Name **each** transmission method described below:

   (a) data is transmitted in both directions at the same time [1]

   ....

   (b) data is transmitted in one direction only [1]

   ....

   (c) data is transmitted in both directions but only in one direction at any time [1]

   ....

7. Packet switching is a common method of communication used on Wide Area Networks. Apart from the actual data to be transmitted, describe the typical contents of a packet. [3]

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FROM: The Manager

TO: Candidate

SENT: Today

SUBJECT: Network Design

We are undecided on the network design we should adopt. I appreciate that this is a very important decision and would welcome your views and recommendations.
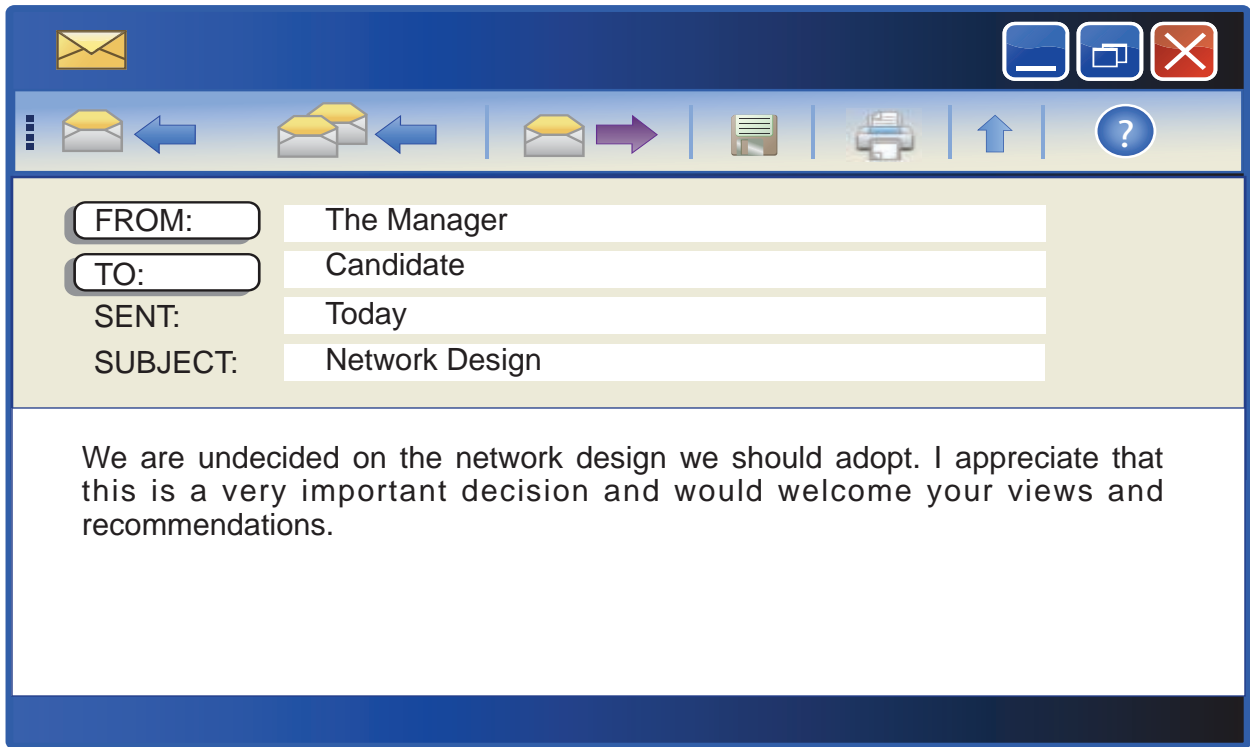
8. Describe in detail the main features of peer-to-peer and client-server networks. Recommend which of these is the most suitable option of network design for Mynydd Bach Outdoor Adventures and justify your choice. [10]

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Turn over.