NCC EDUCATION

**INTERNATIONAL DIPLOMA
IN
COMPUTER STUDIES (Version 5.4)**

Developing A Website

DECEMBER 2008

MARKING SCHEME

**ANSWER ANY FOUR QUESTIONS
FROM THE SIX QUESTIONS GIVEN**

Markers are advised that many answers in Marking Schemes are **examples only** of what we might expect from candidates. Unless a question **specifically states** that an answer is demanded in a particular form, then an answer, which is, correct, factually or in computing practice, must be given the available marks.

If there is doubt as to the correctness of an answer the recommended textbook should consulted. If doubt persists the scripts should be referred to the Examiner and, if necessary to the Moderator, for a second marking.

Question 1

a)   Internet Service Providers (ISP) commonly provides services to assist organizations,   firms or individuals who need to be connected to the Internet. List and describe THREE Internet connectivity services provided by ISP.   (6 marks)

- **Dial-up service**dial in to ISP using standard telephone
- **ISDN dial up**ISDN provides much higher bandwidth and can be used to provide server connectivity but still requires dialing up
- **Dedicated Leased Line**permanent, dedicated connection but much higher cost

(Award 2 marks each- max of 6 marks)

b)   It is said that ISP's like to "lock" their customers. Give THREE examples of how they can do that.   (3 marks)

3 examples of how ISP's lock customers

- Provide domain names that are part of ISP names. Since the corporate letter head of a company shows the domain name, it is hard for client to change ISP.
- Web site is non-portable because of specific services or software offered by the ISP
- Low cost web space does not allow users to use their own domain names.

(Award 1 mark for each valid example- max of 3 marks)

c)   What issues should a Webmaster consider when preparing a multimedia Internet Application so that it will run on the 'average' computer at 'average' speed?   (3 marks)

- Number and size of digitized images/videos should be kept to a minimum. [1]
- Window size of the digitized images/video should not exceed a quarter of the screen. [1]
- Sound files should not be integrated into the application, use other sound such as MID, AIF, etc. instead. [1]
- Text (especially banners, etc.) converted to bitmaps as not all users have the fonts type that are being used. [1]
- Should avoid Auto Refreshing, as it will slow down each multimedia content update. [1]

(Award 1 mark each for any 3 of the 5 answers accepted. Other sensible explanation should also receive credit. 3 marks max)

d)   Describe FIVE (5) roles of webmaster.   (5 marks)

- The focal point within an organization for all the activities to do with the use of the web, both internally and externally.
- The champion for the effective use of web resources.
- Pro-active in identifying new opportunities. This is particularly important since the use of the web for commercial purposes is relatively new, and it is unlikely that many business managers will recognize all the possibilities.
- A leader in designing the corporate web site. This does not necessarily mean that the webmaster should carry out this work directly, but should certainly be able to make appropriate judgements.
- Aware of the need to maintain the image and design of the web site so that it is coherent with the overall corporate identity.

- ▪ Responsible for the day to day operation of the web site. This should place strong emphasis on its security.
- ▪ The gatekeeper for the Quality Assurance of all material published on the web site.

(Award 1 mark each – max of 5 marks)

e) Many organisations have produced corporate policies that require all data imported and exported from the organisation to be virus tested. Failure to comply with this is often a disciplinary offence. Describe why this has occurred. (8 marks)

The probable answers are:
- ▪ Any organisation that exports a virus to another organisation could be held liable for the damage that the virus did to that organisation.
- ▪ The organisation's commercial credibility will be at stake if the virus came for it.
- ▪ Most common routes for virus penetration are via floppy disks, e-mail messages and downloaded software. Therefore many organisations insist on imported data to be virus-tested before use
- ▪ Virus testing minimises the probability that a virus will successfully infect the organisation's network

(Award 2 marks each- max of 8 marks)

Total: 25 marks

Question 2

a) What is communications protocol and why are communications protocols important for the Internet? (1 mark)

– a set of rules or conventions that define how two entities cooperate to exchange data

b) Describe THREE (3) e-mail protocols. (6 marks)

SMTP Simple Mail Transport Protocol – transfers messages between hosts
POP Post Office Protocol – user mail accounts, select mail message from server and maintain user security
MIME Multipurpose Internet Mail Extension – allows binary files to be sent with 7 bit message

(Award 2 marks each- max of 6 marks)

c) E-mail delivery across the internet relies on the use of email address. Explain clearly how an email address enables an email to move from sender to recipient. (6 marks)

- Email relies on the use of address fro the delivery of mail.
- The internet email address is made up of two parts username @ domainname Example john@happy.com
- Email uses store and forward approach;
- email message will be stored (perhaps very briefly) at a number of points before could reach the recipient.

(Award 2 marks each- max of 6 marks)

d) Explain how VoIP technology works. Give TWO(2) reasons why it is getting increasingly popular. (5 marks)

Voice over Internet Protocol – the transmission of voice over the Internet using packet-switched system over connection-oriented telephone system

Method: voice signal converted into digital signal- digital signal chopped into packets- sent by possibly varying routes with different timings to destination point- assembled back into a continuous audio waveform with accurate timing and no gaps- reproduction of voice with acceptable level of reproduction of original audiosignal
Reason for popularity: Internet access is normally charged on local call rate or flat   rate basis unlike international or national telephone calls are charged on basis of distance-quite considerable cost savings in phone calls made over Internet
(Award 3 marks for VoIP explanation and 2 marks for reasons)

e)   Explain what is meant by Intellectual Property Rights (IPR)? List two types of IPR.
                                                                                                (3 marks)

The people who develop web pages or program or code or write books or paint pictures own IPR in what they have produced. (1 mark)
Two types of IPR are: copyright and patent. (2 marks)

f)   Distinguish between Hypertext Transfer Protocol and Internet Protocol.   (4 marks)
      Hypertext Transfer Protocol
           The protocol for moving hypertext files across the Internet that requires a HTTP client and HTTP server program.
           A protocol used in World Wide Web

      Internet Protocol
           Internet Protocol defines the rules that determine how packets are transferred from one host to another
           Internet Protocol address is dependency
      (Award 2 marks each- max of 4 marks)

                                                                                    Total: 25 marks

Question 3
a)   Using appropriate HTML tags, provide examples to produce the following:

   i)   Unordered list with 2 items listed
           <UL>
               <LI>item1</LI>
               <LI>item2</LI>
           </UL>
           (Award 2 marks)
   ii)   Ordered list with 3 items listed
                   <OL>
                       <LI>item1</LI>
                        <LI>item2</LI>
                       <LI>item2</LI>
                   </OL>
               (Award 3 marks)

   iii)   A table with 2 rows and 3 columns
                   <TABLE>
                       <TR> <TD>text</TD>   <TD>text</TD> <TD>text</TD>   </TR>
                       <TR> <TD>text</TD>   <TD>text</TD> <TD>text</TD>   </TR>

                                    </TABLE>
(Award 4 marks)

iv)   Format a sentence with font size 5, font face Tahoma, Bold and underline.

                                      <FONT SIZE="5" FACE="Tahoma">
                                        <B><U>text</B></U>
                                        </FONT>
(Award 4 marks)

v)   A text hyperlink "click here"
        <A HREF="url">click me</A>
(Award 1 mark)

vi)   An image link using file name "my.jpeg"
        <A HREF="url"><IMG SRC="my.jpeg"></A>
(Award 1 mark)

b)   Describe THREE (3) situations where forms are usually used on the internet.   (3 marks)
-       Joining or subscribing to a membership organisation
-       Opening an account for internet shopping
-       Defining your search criteria for search engines

(Award 1 mark each – max of 3 marks)

c)   Why can a simple HTML form not validate user input? At what point can the data be validated?   (7 marks)

A simple HTML form cannot validate user input because there is no data processing capability associated with the collection of data.**[2]**
The browser simply returns all the data that the user has entered regardless of its correctness.**[1]**
The first point at which the data can be validated is when it is received by the application, which may be located on the web server or possibly some other machine. **[1]**
At that point any desired validation can be carried out. **[1]**
If an error is discovered, the application must return HTML showing the problem to the user**.
[1]**
This is typically accomplished by returning the whole form, with an error message indicating the problem and prompting for new input. **[1]**

Total: 25 marks

Question 4

a) An Airline Reservation System should be able to pass the ACID test.
List and explain FOUR (4) items in the ACID test.   (8 marks)
-   **Network utilities –** scan messages entering organisations
-   **Client utilities** – look for problems on the desktop
-   **Scanners** –look for virus signature
-   **Checksummer** – looks for changes in files

  (Award 2 marks each 2 –max of 8 marks)

b)   List and describe FOUR (4) database models.   (8 marks)
   -hierarchical model – is based directly on the methods used in file based systems. It has only limited facilities for representing the relationships between records – they must form a simple hierarchy. This is a very severe limitation for many system designs which can require the programmer and database designer to adopt some very complex work-arounds.
   - **network model** – supports much more general relationships between data records. They are still based strongly on traditional file based thinking. They rely on the programmer to 'navigate' from one record to another within the program code.
   - **relational model** – takes an entirely different approach and they are based on some sound theoretical concepts which are not simply developments of old file based processing. This model is based on relations or tables.
   - **object model** – is designed around a different paradigm, which may become very useful for the support of web sites.
   (Award 2 marks each 2 max of 8)

c)   Web server is a computer that delivers web pages. Identify THREE (3) major risk of implementing a web server.   (6 marks)
   – **hacking by hackers** who attempt to gain access to internal systems of the web server/web site as a skills challenge, as a base for other activities, as a base to intercept communications and to carry out fraud or espionage
   – **denial of service**
   – **risks from internal users** who may abuse the LAN, the internet connection and the website to obtain illegal material which may be stored in a disguised way on corporate servers to avoid detection
   – **risk from viruses** that may be capable of replicating or copying itself and spreading rapidly across networks often causing damages ranging from minimal to complete debilitating
   –   **legal issues** which differs from one country to another and is changing all the time. The law both limits what a web site can do, and gives some protection against the actions of other. The law as it affects web sites has both criminal and civil aspects where if breached, owner can be fined or imprisoned
   (Award 2 marks each –max of 6 marks)

d)   Give THREE advantages of Cascading Style Sheets (CSS).   (3 marks)
   Any three points:
   ▪ Simplifies HTML by separating format from content – makes HTML much easier to write and understand
   ▪ Allows alternative styles of presentation for different types of device
   ▪ Separation of style sheets from text contents makes it possible to reuse styles
   ▪ Ensures uniformity across a wide range of web pages
   (Award 1 mark each – max of 3 marks)

Total: 25 marks

Question 5

a) Give a definition for EACH of the following:

    i) Protocol (2 marks)
    A set of rules governing the transmission of information over a data communications channel.

    ii) Network (2 marks)
    A system of interconnected computers and terminal that communicates with each other.

    iii) Intranet (2 marks)
    A private network inside a company, which uses software like that used on the Internet, but is for internal use only, and is not accessible to the public.

    iv) Internet (2 marks)
    A network of many networks that interconnect worldwide and use the Internet Protocol.

    v) Extranet (2 marks)
    A part of a company's intranet that is made accessible to other companies. The shared information might be accessible only to the collaborating parties.

b) Distinguish between ASP and JavaScript. (4 marks)

    ASP
    - Server site scripting
    - Server carries out all the processing contained within the ASP script before the HTML is sent to the client
    JavaScript
    - Client site scripting
    - The code is visible to the user
    - Not a good security policy
    (Award 2 marks each- max of 4 marks)

c) What is the reason behind the development of Domain Name System (DNS)?
    (4 marks)
    Since each host requires a unique dotted quad address, it would quickly become difficult and inconvenient to remember all these numerical address. DNS, a distributed database, that is used to translate domain names into Internet Protocol numbers, which are what computers need to find each other on the Internet.
    (Award max of 4 marks for explanation)

d) Based on your understanding, explain what is meant by IP Address? (5 marks)
    A unique 32-bit number
    Separated in four 8-bit number
    Called as octet
    The four octets are connected by periods and the numbers must be in the   range   0 – 255.

Divided into four classes: Class A, Class B, Class C and Class D Example: 64.91.238.68

(Award 1 mark for each point- max of 5 marks)

e) What is a host? (2 marks)

A network computer that is a repository for services available to other computers on the network

Total: 25 marks

Question 6

a) Explain five objectives of the DBMS approach. (10 marks)

<u>Program/Data Independence</u>

The database is separated from the form layout and the programming. This is the concept of a 2 tier application where the database layer is separated from the presentation and business logic layer. (that is a database management system seeks to decouple data from program)

(2 marks)

<u>Data Abstraction</u>

In a non database system, the designer must deal with the data at a very low level. Data can be viewed, at a higher level of abstraction, as a series of entities with attributes. Thus the system designer can work in these terms. Thus users can always think about the database at a higher level without being concerned about the actual physical storage mechanisms.

(2 marks)

<u>Multiple Views of Data</u>

Different types of users have different requirements for a system. All users cannot have the same access rights and permissions. Thus a person can be granted the permission to read the data only and another one can have the permission to update the data. In addition, depending on the persons job, he will access fields which will be important to him, example a clerk will not see the salary for each employee!

(2 marks)

<u>Concurrency</u>

Many users can be using the same table at a given time. A user can request for a read transaction and another one can request for an update transaction. So a DBMS handles concurrent transaction. (2 marks)

<u>Security</u>

Security is concerned with making sure that only those users or processes can see or modify the data that they should to access. (2 marks)

Allocate 1 mark valid per point to the maximum shown in each of above

b) Discuss the reasons for using a database in a website. (5 marks)

In a business context, the web page will normally be dynamic, rather than static. A web site may need to hold information on its products it is currently selling and names of its customers. So the web page needs to be connected to a database in order to meet the requirements mentioned above. (5 marks)

c) Discuss the security measures that can be taken to prevent unauthorized persons from gaining access to a web server. (4 marks)

The security measures can be both logical and physical. The server must be restricted to other users by means of password. Identity of users will be of paramount importance. Password should be changed on a regular basis. Regular monitor of viruses should be done. In this context a contingency plan can be prepared.

Allocate 1 mark per statement (4 marks)

d) Describe SIX administrative functions that are usually associated with a mailing list.

(6 marks)

- Accepting new members
- Removing members
- Accepting or rejecting messages from members for display in the   mailing list
- Sending messages to the list
- Providing help and background information
- Providing access to archives

(Award 1 mark each – max of 6 marks)

Total: 25 marks