

NCC EDUCATION
INTERNATIONAL DIPLOMA
IN
COMPUTER STUDIES
COMPUTER TECHNOLOGY
1st JUNE 2008

MARKING SCHEME

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 that is correct, factually or in practical terms, must be given the available marks.

If there is doubt as to the correctness of an answer the relevant NCC textbook should be the first authority.

This Marking Scheme has been prepared as a guide only to markers. This is **ABSOLUTELY NOT** a set of model answers; **NOR** is the Marking Scheme exclusive, for there will frequently be alternative responses which will provide a valid answer.

Notice to Markers

Where markers award half marks in any part of a question they should ensure that the total mark recorded for a question is a whole mark.

SECTION A - 1

**ANSWER ALL QUESTIONS FROM THIS SECTION
EACH QUESTION REQUIRES ONE RESPONSE ONLY**

For each question enter ONE capital letter ONLY in your answer booklet.

	Marks
<p>QUESTION 1</p> <p>A company sells books online. It has no physical retail outlets. Its information systems which drive this activity can therefore be described as</p> <p>A) strategic B) managerial C) mission critical D) knowledge based</p> <p><i>Answer C</i></p>	1
<p>QUESTION 2</p> <p>Which data structure might be used to keep track of the separate blocks making up a file on a magnetic disk?</p> <p>A) Queue B) Stack C) Linked list D) Tree</p> <p><i>Answer C</i></p>	1
<p>QUESTION 3</p> <p>The records in a file are held at disk addresses which are determined by applying an algorithm to the key field. This method of locating records is an example of</p> <p>A) Hashing B) Indexed sequential file C) Serial file D) Virtual memory</p> <p><i>Answer A</i></p>	1
<p>QUESTION 4</p> <p>Which of the following activities is suitable for connection mode data transmission?</p> <p>A) direct terminal use of a remote computer B) using FTP to upload data to a web server C) email D) downloading a web page</p> <p><i>Answer A</i></p>	1
<p>QUESTION 5</p> <p>Which one of these is a valid IP address?</p> <p>A) 0,1,256,234 B) 255,34,23 C) 118,222,123,1 D) 123,233,122,33,1</p> <p><i>Answer C</i></p>	1
<p>QUESTION 6</p> <p>Which of the following allows the use of text names instead of IP addresses when accessing a web site?</p> <p>A) FTP B) UDP C) TCP D) DNS</p> <p><i>Answer D</i></p>	1
<p>QUESTION 7</p> <p>Which of the following is a disadvantage of using MP3 format to store a song?</p> <p>A) MP3 gives no control over compression levels B) MP3 quality is poor C) MP3 has to be decompressed when playing D) A song stored in MP3 format is over 40Mb</p> <p><i>Answer C</i></p>	1

QUESTION 8

Which of the following is a result of the increase in the use of Open Source software?

- A) Software is developed more slowly
- B) Software is less reliable
- C) More people cooperate in producing software
- D) Fewer operating platforms are supported

Answer C

QUESTION 9

The programming language Perl is particularly useful for

- A) writing system software
- B) writing web based applets
- C) text processing
- D) writing database systems

Answer C

QUESTION 10

Which of the following is a disadvantage of using laptops when travelling?

- A) Laptops are slower than desktop PCs
- B) Laptops have less RAM than desktop PCs
- C) Laptop battery life is often short
- D) Laptops cannot use the same version of operating system as desktop PCs

Answer C

SECTION A – 2
ANSWER ALL QUESTIONS FROM THIS SECTION
EACH QUESTION REQUIRES MORE THAN ONE RESPONSE

Marks

QUESTION 11

3

Which THREE of the following are the most likely to affect the ranking of a web site by a search engine?

- A) a random function
- B) payment by the advertiser
- C) number of links to the site from other sites
- D) time of day
- E) number of occurrences of search string on page
- F) size of web site

Answer *b), c), e)*

3 points, 1 mark each

QUESTION 12

3

Which THREE of the following activities can be classified as relating to inbound logistics?

- A) machining
- B) packaging
- C) warehousing
- D) inventory control
- E) delivery vehicle operation
- F) material handling

Answer *c), d), f)*

3 points, 1 mark each

QUESTION 13

3

Which THREE of the following must be known by the memory manager of an operating system?

- A) which memory is in use
- B) which memory is not in use
- C) which programs are currently on the hard disk
- D) the type of processor
- E) the contents of the program counter
- F) which processes are swapped in

Answer *a), b), f)*

1 mark each, max 3

QUESTION 14

3

Convert the decimal number 54 to

- A) 8 bit two's complement binary
- B) hexadecimal
- C) BCD

Answer *a) 00110110*

b) 36

c) 101100

1 mark each, max 3

QUESTION 15**3**

Which THREE of the following file types are used to store still images?

- A) jpeg
- B) avi
- C) mov
- D) mp3
- E) pcx
- F) gif

Answer a), e), f)

1 mark each, max 3

QUESTION 16**3**

The following are actions that are carried out during the transfer of data in a network:

- A) coordination between two presentation entities, supporting orderly data exchange
- B) optimisation of available network services
- C) provision of transport entities independence of routing

Identify the OSI layer responsible for each of these actions.

Choose from:

- i) presentation layer
- ii) session layer
- iii) transport layer
- iv) network layer

Answer A) ii) (session)

B) iii) (transport)

C) iv) (network)

1 mark each, max 3

QUESTION 17**3**

Which THREE of the following are objectives in the design process of software engineering?

- A) production of models
- B) writing of code
- C) testing the software
- D) investigating the company's needs
- E) examining various alternatives
- F) planning development activities

Answer a), e), f)

1 mark each, max 3

QUESTION 18**3**

Which THREE of the following are features of data mining?

- A) data entry
- B) data classification
- C) cluster analysis
- D) regression analysis
- E) query handling
- F) report building

Answer a), c), d)

1 mark each, max 3

QUESTION 19**3**

Which THREE of the following are reasons why the development and maintenance of satellite communications systems pose problems?

- A) satellites cost a lot to launch
- B) satellites degrade the signals sent to them
- C) satellite signals cannot be received in remote areas
- D) satellite signals suffer from delay
- E) satellites are always moving relative to the ground
- F) satellite signals are weak

Answer a), d), f)

1 mark each, max 3

QUESTION 20**3**

Which THREE of the following areas of activity are most likely to make use of multimedia technology?

- A) training
- B) entertainment
- C) invoice processing
- D) education
- E) process control
- F) engine management systems

Answer a), b), d)

1 mark each, max 3

Total 40 Marks

SECTION B
ANSWER ANY THREE QUESTIONS

QUESTION 21
Marks

Throughout the question, please credit any valid alternative point.

- | | | | |
|----|------|--|---|
| a) | i) | Distinguish between the terms <i>system software</i> and <i>application software</i> . | 2 |
| | | <ul style="list-style-type: none"> • <i>system software manages the operation of the computer</i> • <i>applications solve problems for users</i> | |
| | | <i>1 mark each, max 2</i> | |
| | ii) | Explain what is meant by <i>batch processing</i> . | 3 |
| | | <ul style="list-style-type: none"> • <i>data / jobs collected together</i> • <i>processed afterwards</i> • <i>no further human intervention required</i> • <i>output from each job kept separate</i> | |
| | | <i>any 3 points, 1 mark each, max 3</i> | |
| | iii) | Explain why batch processing is inefficient where there is a great deal of input or output involved. | 2 |
| | | <ul style="list-style-type: none"> • <i>input / output is slow compared to processor operation</i> • <i>processor kept waiting</i> | |
| | | <i>2 points, 1 mark each, max 2</i> | |
| | iv) | Explain how a multiprogramming operating system can improve the efficiency of batch processing. | 2 |
| | | <ul style="list-style-type: none"> • <i>processor can be kept busy while input / output is proceeding</i> • <i>can work on another process</i> | |
| | | <i>2 points, 1 mark each, max 2</i> | |
| | v) | State the objectives of a multiprogramming operating system. | 4 |
| | | <ul style="list-style-type: none"> • <i>minimise unused CPU time</i> • <i>reduce incidence of peripheral-bound operations</i> • <i>minimise total elapsed time</i> • <i>prevent single programs dominating the CPU</i> | |
| | | <i>4 points, 1 mark each, max 4</i> | |
| | vi) | State the objectives of a multi-access operating system. | 3 |
| | | <ul style="list-style-type: none"> • <i>users must get a fast response</i> • <i>users must be protected from each other</i> • <i>must cope with unpredictable actions</i> | |
| | | <i>3 points, 1 mark each, max 3</i> | |
| b) | i) | Distinguish between a <i>program</i> and a <i>process</i> . | 2 |
| | | <ul style="list-style-type: none"> • <i>program is instructions to the processor</i> • <i>process is program in execution</i> | |
| | | <i>2 points, 1 mark each, max 2</i> | |
| | ii) | Describe the purpose of a PCB (Process Control Block). | 2 |
| | | <ul style="list-style-type: none"> • <i>data structure</i> • <i>holds information about a process</i> • <i>and its state of execution</i> • <i>contains an identification number</i> | |
| | | <i>any 2 points, 1 mark each, max 2</i> | |

Total 20 Marks

QUESTION 22**Marks****Throughout the question, please credit any valid alternative point.**

- a) i) Explain what *Unicode* is. 4
- *system for storage of characters*
 - *16 bit*
 - *codes for over 65000 characters*
 - *can code for most world languages*
 - *can store mathematical symbols*
- any 4 points, 1 mark each, max 4*
- ii) Describe how a date such as 23 November 2008 can be stored using simple data types. 4
- *divided into fields / parts*
 - *each field can be a different data type*
 - *example 23 / 2008 as integer*
 - *example November as string*
- 4 points, 1 mark each max 4*
- b) i) Define the term *file*. 2
- *store of data*
 - *on a computer system*
 - *collection of records*
- any 2 points, 1 mark each, max 2*
- ii) Describe what is meant by a *transaction file*. 3
- *information about events*
 - *in chronological / no particular order*
 - *used to update master files*
- 3 points, 1 mark each, max 3*
- iii) Distinguish between a serial file and a sequential file. 3
- *serial file is one record after another*
 - *in no particular order*
 - *sequential file is in order*
 - *using a key field*
- 3 points, 1 mark each, max 3*
- iv) Explain how a record is added to a sequential file. 4
- *start at beginning of old file*
 - *read through until correct position*
 - *write first part of old file to new file*
 - *write new record to new file*
 - *write remainder of old file to new file*
- any 4 points, 1 mark each, max 4*

Total 20 Marks

QUESTION 23**Marks****Throughout the question, please credit any valid alternative point.**

- a) i) In terms of networks, explain what is meant by a *packet*. 2
- *a data item*
 - *usually part of a group making up a message*
- 1 mark each, max 2*
- ii) Identify FOUR components of a packet. 4
- *source address*
 - *destination address*
 - *packet sequence number*
 - *data*
 - *checksum*
- Any 4 points, 1 mark each, max 4*
- iii) Explain why packet switching is an advantage in sending data over the Internet. 3
- *all users can share the same paths*
 - *reduces amount of infrastructure required*
 - *allows packets to travel by different routes*
 - *this optimises transmission speeds*
- Any 3 points, 1 mark each, max 3*
- b) i) Explain what a *gateway* is. 2
- *a computer or node*
 - *connection point between two networks*
- 2 points, 1 mark each, max 2*
- ii) Explain the meaning of the term *intranet*. 3
- *private information service*
 - *resembles internet / uses same technology / protocols as internet*
 - *physically isolated from internet*
- 1 mark each, max 3*
- c) i) Define the term LAN. 2
- *Local Area Network*
 - *network on one site / location*
 - *infrastructure owned by the owner of the network*
- Any 2 points, 1 mark each, max 2*
- ii) Explain why many recent LANs are wireless based. 4
- *avoids cabling*
 - *cabling is expensive*
 - *cabling may be difficult to implement*
 - *cabling may be prohibited*
 - *cabling is difficult to expand*
 - *wireless allows working from any location in range*
 - *wireless is flexible / adaptable*
- Any 4 points, 1 mark each, max 4*

Total 20 Marks

QUESTION 24**Marks****Throughout the question, please credit any valid alternative point.**

- a) i) Explain the difference between a database and a DBMS. 4
- *a database is a store of data*
 - *a database is not software*
 - *a DBMS is a software tool*
 - *a DBMS is used to create a database system*
- 1 mark each, max 4*
- ii) State FOUR benefits of using a database in a business rather than using separate files. 4
- examples*
- *software independent*
 - *data only entered once*
 - *non redundancy*
 - *more likely to be accurate / up to date*
 - *flexible handling of data*
 - *control / security*
 - *backup more controlled*
 - *many tools available to handle databases*
 - *basis of a good business-wide data strategy*
- Any 4 points, 1 mark each, max 4*
- b) i) A car door is made from metal panels, locks, handles and hinges. State the simplest data model that could be used to keep the data about relevant parts correctly associated. 1
- *hierarchical*
- 1 mark*
- ii) Relational databases store data in tables. State THREE rules that govern the layout of tables 3
- *each row must be in the same format*
 - *all the data in a column must be the same type*
 - *each row must contain a primary key*
 - *the sequence of rows is not predictable*
- any 3 points, 1 mark each, max 3*
- c) i) Explain what is meant by a *query*. 2
- *a question*
 - *to extract data from a database*
- 1 mark each, max 2*
- ii) Describe TWO ways in which a query can be performed. 4
- *query language / SQL*
 - *query is asked using special computer language*
 - *query by example / QBE*
 - *grid filled in with example of the type of result*
- 4 points, 1 mark each, max 4*
- iii) Explain the purpose of forms in a database management system. 2
- *user friendly interface*
 - *for displaying data*
 - *for entering data*
 - *for entering enquiries*
 - *can perform processing (e.g. totals)*
- any 2 points, 1 mark each, max 2*

Total 20 Marks