



**NCC INTERNATIONAL DIPLOMA
IN
COMPUTER STUDIES**

COMPUTER TECHNOLOGY

6th March 2005

MARKING GUIDE

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 should be 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.

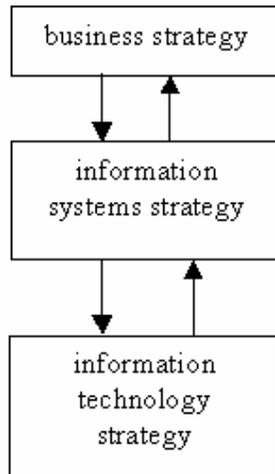
Marks

QUESTION 1

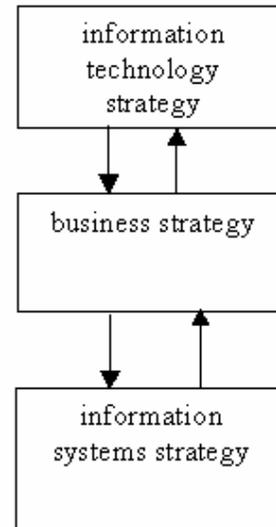
1

Which of the following diagrams shows the correct relationships between the business strategy and the information provision of an organisation?

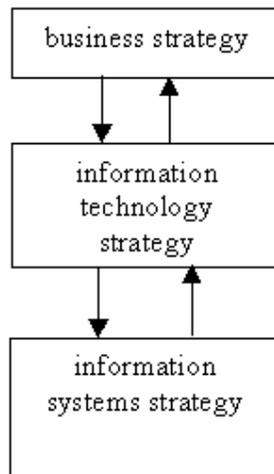
A)



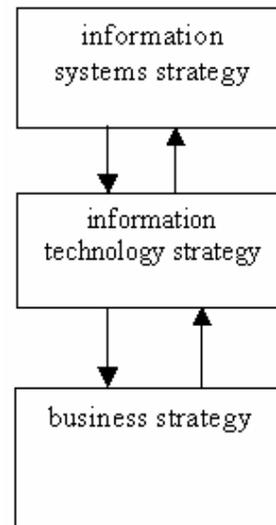
C)



B)



D)



Answer A

QUESTION 2

1

In an organisation, accounting takes place at which level?

- A) organisational
- B) operational

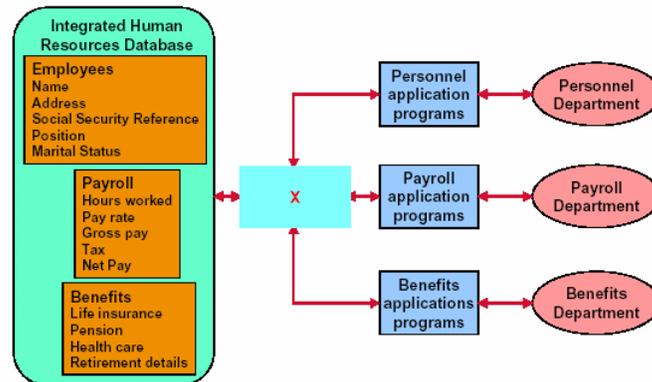
- C) strategic
- D) management

Answer B

QUESTION 3

1

The diagram shows the information system of an organisation. What is represented by X?



- A) a database table
- B) database reports
- C) a database management system
- D) a database index

Answer C

QUESTION 4

1

A computer program that simulates human reasoning is called

- A) virtual reality
- B) a decision support system
- C) an expert system
- D) a knowledge base

Answer C

QUESTION 5

1

Which of the following is an input device?

- A) a floppy disk
- B) a mouse
- C) a printer
- D) a network interface card

Answer B

QUESTION 6

1

When a program is running, the program instructions are fetched directly from

- A) the processor
- B) the hard disk
- C) virtual memory
- D) RAM

Answer B

QUESTION 7

1

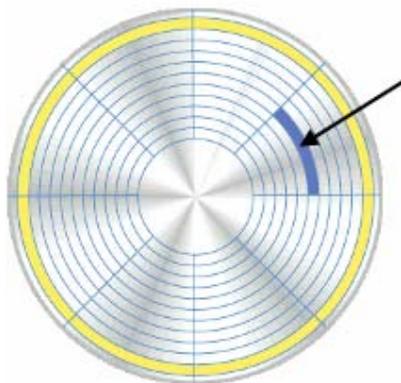
Which of the following could be part of the input to a payroll system?

- A) wages slips
- B) the tax due
- C) number of hours worked
- D) the amount paid

Answer C

QUESTION 8

In the following diagram of a magnetic disk, what is the shaded part indicated by the arrow?



- A) a sector
- B) a track
- C) a cylinder
- D) a cluster

Answer A

QUESTION 9

Which of the following business activities is most suited to a batch processing operating system?

- A) hotel bookings
- B) process control
- C) electricity bill processing
- D) report writing

Answer C

QUESTION 10

Which of the following is an Internet protocol?

- A) XML
- B) java
- C) FTP
- D) GIF

Answer C

SECTION A - 2

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

General marking principle: If the candidate gives more than the required number of responses, take the first n given up to the number required.

QUESTION 11

Match the following items **A, B, and C** to the appropriate amount of storage space shown in the list below.

- A) the capacity of a typical modern PC hard drive
- B) a bitmapped image file of a complete screen
- C) the approximate capacity of a compact disk

- i) 80 Gb
- ii) 2 Gb
- iii) 700 Mb
- iv) 1 Mb
- v) 1 K

Answer A) i, B) iv, C) iii
1 mark each – max 3

QUESTION 12

3

The following are levels of management in a company:

- A) top – concerned with the planning the direction of the company
- B) middle – concerned with running departments
- C) supervisory – concerned with guiding the daily actions of employees.

For each of these levels of management, choose the type of information that it is most likely to need.

- i) structured, regular and concerned with the near future
- ii) regular, concerned with every detail and with a long term view
- iii) unstructured and informal
- iv) repetitive and has a short term view
- v) informal and regular

Answer A)iii, B) i, C) iv
 1 mark each – max 3

QUESTION 13

3

Which THREE of the following are examples of system software?

- A) linker
- B) database manager
- C) web editor
- D) loader
- E) interpreter
- F) graphics editor

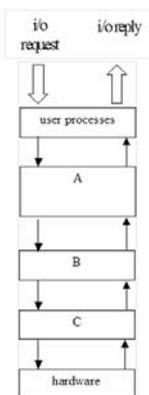
Answer A, D, E
 1 mark each – max 3. If more than 3 given, take first 3.

QUESTION 14

3

The diagram shows how layers are used by an operating system to connect user processes to the underlying hardware. Identify the layers **A, B and C**, choosing from the list below:

- i) interrupt handlers
- ii) device drivers
- iii) compiler
- iv) interpreter
- v) device-independent software



Answer A) v, B) ii, C) i
 1 mark each – max 3

QUESTION 15**3**

The following are compression standards used in multimedia applications:

- A) MP3
- B) JPEG
- C) MPEG

Match each of these standards with the appropriate type of file (i) to (vi).

- i) text
- ii) executable files
- iii) applets
- iv) moving pictures
- v) sound
- vi) still images

Answer A) v (sound), B) vi (still images), C) iv (moving pictures)

1 mark each – max 3

QUESTION 16**3**

Which THREE of the following are optical storage media?

- A) floppy disk
- B) CD
- C) CD-R
- D) DVD
- E) hard disk
- F) flash memory

Answer B, C, D

1 mark each – max 3. If more than 3 given, mark first 3.

QUESTION 17**3**

Identify the purpose of the following three registers.

- A) program counter
- B) stack pointer
- C) general purpose register

Choose from:

- i) store a condition resulting from an instruction such as stack overflow
- ii) store return addresses for use after a procedure has been run
- iii) ensure that the program instructions are executed in the proper order
- iv) store the intermediate results of a calculation
- v) hold an instruction while it is being executed

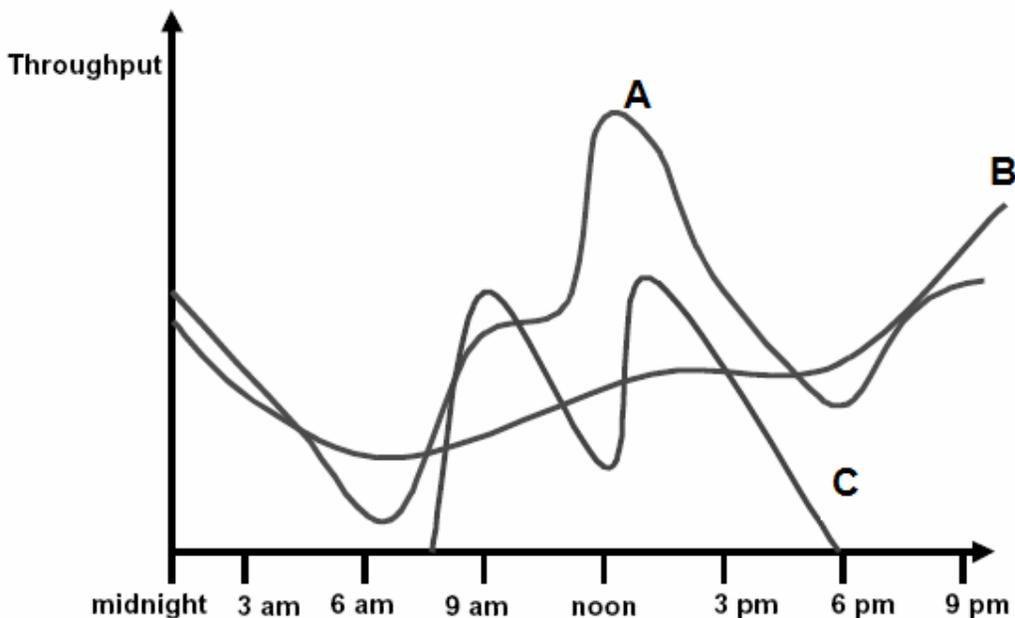
Answer (A)iii, (B)ii, (C)iv

1 mark each – max 3

QUESTION 18

3

The graph shows the daily level of activity experienced by IT systems in three situations, A, B and C.



Identify the situations from the following list:

- i) a hospital emergency room
- ii) a payroll processing operation
- iii) a bank
- iv) an invoicing system
- v) a hospital outpatient department

Answer A)iii, B)i, C)v

1 mark each - max 3

QUESTION 19

3

Convert the decimal (denary) number 56 to

- A) 8 bit binary
- B) BCD
- C) hexadecimal

Answer A) 00111000 (all 8 bits must be present), B) 01010110, C) 38

1 mark each - max 3

QUESTION 20

3

Which THREE of the following aspects of a network are the concern of the physical layer?

- A) initialising and terminating a session
- B) error correction
- C) cabling
- D) establish electrical connections
- E) junctions between fibre optic and electrical cabling
- F) construction of data packets

Answer C, D, E

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) The Windows operating system offers plug and play facilities. Explain what is meant by *plug and play*. **3**
- *Allows new hardware to be recognised*
 - *When first connected*
 - *Allocates appropriate driver*
- 1 mark each – max 3*
- ii) State what task is made unnecessary by plug and play facilities. **1**
- *Installation of (hardware) drivers*
- 1 mark*
- iii) Windows offers users multi-tasking capabilities. Explain what is meant by *multi-tasking*. **2**
- *The ability to run 2 or more programs over the same time period*
 - *Apparently simultaneously*
 - *Communication possible between them*
- Any 2 points, 1 mark each (max 2)*
- iv) Explain how time sharing capabilities allow multi-tasking to take place. **2**
- *Programs in memory allocated processor time*
 - *Take turns in accessing processor*
- 2 marks*
- v) State THREE objectives of a multiprogramming operating system. **3**
- *Minimise unused CPU time*
 - *Reduce the incidence of peripheral bound operations*
 - *Minimise total elapsed time*
 - *Prevent single programs from dominating the CPU*
- any 3 points, 1 mark each*
- b) Distinguish between a client-server and a distributed computer system. **6**
- Client-server*
- *Applications reside on server*
 - *A means of implementing a LAN*
 - *Client machines access the server*
 - *Server provides services (such as file and print)*
- Distributed system*
- *Multiple computers cooperate*
 - *Resources are held at different nodes/locations*
 - *E.g. printers/CPU's/data/software*
 - *Transparent to user*
- any 6 points, 1 mark each*

- c) i) Describe what is meant by a *multiprocessor operating system*. 1
- *OS handles execution of program across more than 1 CPU*
- 1 mark*
- ii) State ONE advantage and ONE disadvantage of multiprocessor based computer systems. 2
- Advantage*
- *Programs run much faster*
- Disadvantage*
- *Programs are more complex*
 - *Programs have to be split into parts to run on each processor*
- any 1 advantage and 1 disadvantage, 1 mark each max 2*

Total 20 Marks

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

- a) i) The ASCII character code system uses 7 bits to store a character. State how many different characters can be encoded by this system. **1**
- *128 (accept 127)*
- 1 mark*
- ii) Explain how the Unicode system is an improvement on ASCII code. **3**
- *Unicode is 16 bit*
 - *Can code up to 65536 (over 64000) characters*
 - *This allows all languages / international characters / symbols to be encoded*
- 3 marks*
- b) i) In terms of *computer systems*, state what is meant by a file. **2**
- *Store of data*
 - *On some form of backing storage / disk / tape*
 - *Referred to by a name*
- any 2 points, 1 mark each (max 2)*
- ii) Explain what is meant by a *flat file database*. **2**
- *A store of data*
 - *Comprising one table only*
- 2 marks*
- iii) Explain how a variable length record differs from a fixed length record. **4**
- Variable*
- *Storage varies according to amount of data*
 - *Fields/records separated by a marker (e.g. comma)*
- Fixed*
- *Space for data storage determined in advance*
 - *Space occupied even if not used*
- 4 marks*
- iv) State TWO advantages and TWO disadvantages of a data file made up of fixed length records. **4**
- Advantage*
- *Position of a record can easily be calculated*
 - *Therefore searching quicker (than for variable length records)*
 - *Amount of storage known in advance*
 - *Therefore can plan amount of backing storage required*
 -
- any 2 points, 1 mark each*
- Disadvantage*
- *Space wasted*
 - *As it is used even if there insufficient data to fill it*
 - *May need to be read by special software*
- any 2 points, 1 mark each*

Marks

- c) i) Explain what is meant by *data redundancy*. 2
- *Repetition of data in a database*
 - *The repetition is unnecessary*
- 2 marks*
- ii) Explain how data redundancy can adversely affect the operation of a database. 2
- *Data may be inconsistent or held more than once*
 - *May not view the current / up to date data*
- 2 marks*

Total 20 Marks

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

- a) i) A company introduces teleworking. State TWO advantages of teleworking to the company's employees. **2**
- *Less travel expense*
 - *Less time lost through travel*
 - *Can work at times to suit the individual*
 - *Can live anywhere and still work for the company*
- any 2 points, 1 mark each*
- ii) State TWO disadvantages of teleworking to the employee. **2**
- *Family distractions*
 - *Need office at home / expense of this*
 - *May miss out on events at office*
 - *Loneliness*
- any 2 points, 1 mark each*
- iii) State TWO resources needed by a teleworker other than a normal computer and a location for it. **2**
- *The communication hardware e.g. router / modem*
 - *The connection e.g. telephone or dedicated link*
 - *The connection service e.g. an ISP*
 - *Communication software e.g. email or browser*
- any 2 points, 1 mark each*
- b) i) A page on a website advertises a course. It can be accessed by entering the URL **3**
<http://www.nccedu.com/courses.html>.
State 1. the file name, 2. the domain name and 3. the protocol used to access this page.
- *File name: courses.html*
 - *Domain name: nccedu.com*
 - *Protocol: http / hypertext transfer protocol*
- 1 mark each, max 3*
- ii) An IP address consists of four numbers, each in the range 0-255. Explain the reason why the numbers cannot exceed 255. **2**
- *Each number is encoded in 8-bit binary*
 - *IP address is 32-bit*
 - *The maximum number in an 8-bit binary number is 255*
- any 2 points, 1 mark each*
- iii) Explain why a person using an Internet browser does not need to remember the IP address of a web resource in order to access it. **3**
- *(Only needs to) enter the name / address / domain of the website*
 - *DNS / Domain Name Server looks up the IP address*
 - *DNS translates / substitutes IP address*
- 1 mark each, max 3*

- c) i) Explain why resources written in Java are often added to a website. **2**
- *To provide interactivity / or example of this such as a chat site*
 - *To provide validation of data*
 - *To provide animations*
 - *Java is program code*
 - *Java code can be executed by a browser*
 - *Java is platform independent*
- any 2 points, 1 mark each*
- ii) With reference to the Internet, explain what is meant by the term *protocol*. **2**
- *A set of rules*
 - *For communication*
- 1 mark each*
- iii) State the meaning of FTP and give an example of where it might be used. **2**
- *File Transfer Protocol*
 - *A standard for moving files from one computer to another*
- either point, 1 mark*
- *Uploading web pages to a server*
 - *Downloading a file from an Internet location / example of this*
 - *Sending files to other users*
- either point, 1 mark*

Total 20 Marks

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

- a) State TWO different types of primary storage memory that can be found in a computer. **2**
- *ROM*
 - *RAM*
 - *Processor cache memory*
- any 2 points, 1 mark each*
- b) i) State the purpose of the control bus in a computer. **2**
- *To carry signals*
 - *Between the processor and memory / ports / device controllers*
- 1 mark each, max 2*
- ii) State THREE separate lines that can make up a control bus. **3**
- *Memory write*
 - *Memory read*
 - *I/O write*
 - *I/O read*
 - *Transfer acknowledge*
 - *Bus request*
 - *Bus grant*
 - *Interrupt request*
 - *Interrupt acknowledge*
 - *Clock*
 - *Reset*
- any 3 points, 1 mark each*
- c) i) PC users often store their data on their PC hard disks. State TWO other items that are commonly stored on a PC hard disk. **2**
- examples:*
- *Application software*
 - *Operating system software*
 - *System settings*
 - *Log files such as websites visited / resources used*
 - *Password details*
 - *Swap files*
 - *Directory structures*
 - *File systems*
 - *Spool files*
- reward other answers if reasonable*
any 2 points, 1 mark each
- ii) When data is to be read from a hard disk, there is a slight delay while the data is retrieved. State FOUR stages that take place in the read process which can each cause a delay. **4**
- *CPU sends signal to drive*
 - *(Read/write) head moves to required track (seek time)*
 - *Disk rotates to correct sector (rotational delay / latency)*
 - *Data is read as disk rotates (rotational delay)*
- 4 points, 1 mark each*

- iii) State THREE considerations that should be taken into account when determining a sensible backup strategy for valuable data. 3
- *Frequency*
 - *How much data (total or incremental)*
 - *Media used*
 - *How long to keep the backups*
 - *Location of backups*
- any 3 points, 1 mark each*
- d) i) State TWO features of a video display adapter that a buyer of a PC needs to take into account when choosing a system. 2
- *Resolution*
 - *Number of colours per pixel*
 - *Speed*
 - *Memory size*
- any 2 points, 1 mark each*
- ii) Dot matrix printers are still popular in certain applications. Give one example of where a dot matrix printer might sensibly be used and explain why it is suitable. 2
- examples:*
- *Credit card receipts*
 - *Garage bills*
 - *Restaurant bills*
- reward any other reasonable situation*
- any 1 point, 1 mark*
- reason*
- *Impact printer*
 - *Can make copies on multi part stationery*
- any 1 point, 1 mark*

Total 20 Marks

Specification Grid IDCS CT March 2005

Section A1	Obj A	Obj B	Obj C	Obj D	Obj E	Obj F	Obj G	Obj H	Obj I	Page reference "Computer technology" (NCC Education Ltd, 2001)
Q1	1									11
Q2	1									13
Q3	1									18
Q4	1									20
Q5		1								36
Q6		1								38
Q7				1						57
Q8			1							60
Q9					1					116
Q10								1		223
total A1	4	2	1	1	1	0	0	1	0	10 marks
Section A2	Obj A	Obj B	Obj C	Obj D	Obj E	Obj F	Obj G	Obj H	Obj I	page reference
Q11						3				44
Q12	3									96
Q13					3					113-114
Q14					3					135
Q15									3	247
Q16			3							64
Q17		3								42
Q18				3						107
Q19						3			3	152
Q20							3			
total A2	3	3	3	3	6	3	3	0	6	30 marks
Section C	Obj A	Obj B	Obj C	Obj D	Obj E	Obj F	Obj G	Obj H	Obj I	page reference
Q21a)i)					3					141
Q21a)ii)					1					141
Q21a)iii)					2					120
Q21a)iv)					2					120
Q21a)v)					3					118
Q21b)					6					122
Q21c)i)					1					123
Q21c)ii)					2					123
Q22a)i)						1				154
Q22a)ii)						2				155
Q22b) i)						3				157
Q22b)ii)						2				157
Q22b)iii), iv)						8				157
Q22c)i, ii)						4				170
Q23a) i, ii)	4									27
Q23a)iii)							2			206
Q23b) i)								3		226
Q23b)ii)								2		222
Q22b)iii)								3		222
Q23c)i)								2		224
Q23c)ii)								4		226
Q24a)i)		2								46
Q24b)i)		2								48
Q24b)ii)		3								48
Q24c)i)			2							60 and general
Q24c)ii)			4							61
Q24c)iii)			3							70 and general
Q24d)i)			2							79
Q24d)ii)			2							81
total B	4	7	13	0	20	20	2	14	0	