education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

INFORMATION TECHNOLOGY

PAPER 2 MEMORANDUM

EXEMPLAR 2008

MARKS: 180

TIME: 3 hours

This memorandum consists of 12 pages.

SECTION A: MULTIPLE-CHOICE QUESTIONS

QUESTION 1

1.1 A ✓

1.2 C ✓

1.3 D ✓

1.4 B ✓

1.5 C ✓

1.6 C ✓

1.7 A ✓

1.8 B ✓

1.9 A ✓

1.10 D ✓

TOTAL SECTION A: 10

SECTION B: HARDWARE AND SOFTWARE

QUESTION 2: HARDWARE AND SOFTWARE

2.1

2.1.1 Around 2 GHz or more. ✓ A fast processor means more efficient running of software ✓ (2)

2.1.2 Minimum 256MB✓. Modern Operating Systems require a minimum amount of RAM. ✓ (2)

2.1.3 Around 40, 60, 80, 100 GB. ✓ Modern Operating System and software takes up more and more space. ✓ (2)

Allow argument that vendors offer a minimum size which is more than adequate for a network environment.

2.1.4 Reduced heat
Reduced power consumption
Less space
ANY TWO ✓✓ (2)

2.1.5 (a) Transferring data to and from different computers not connected to the network. ✓
(any example / explanation implying this answer) (1)

(b) Unreliable
Tendency of careless users to damage disk drive with dirty or damaged discs
Tendency of careless users to spread viruses
Low capacity for modern needs
Slow to access ANY TWO ✓✓

(c) Flash Disc ✓ (2)
– High Capacity
– Fast access
– small, portable and convenient
ANY ONE advantage✓ (2)

2.2

2.2.1

(a) Its only function is to manage all aspects of the network ✓ (1)

(b) An extremely powerful PC - fast processor(s) ✓with lots of RAM (2 GB) ✓, potentially larger hard drive capacity, RAID, faster hard drives (SCSI). (2)

(c) Fat Client: Powerful in terms of speed, RAM etc.
Thin client: Not power in terms of speed, RAM etc. Less expensive. (2)

2.2.2 (a) Peer to peer - sharing of files or peripherals is allowed or disallowed by individual PCs which store the files or have the peripheral locally connected ✓✓ (2)

(b) On a Client-Server network the peripheral is connected to the network via a Print Server or PC and permission is controlled by the server and allocated to specified users or groups of users✓✓ (2)

2.3

2.3.1 Setup of users' rights and privileges to establish privacy and security for users ✓
Setup of user accounts with IDs and passwords✓
Monitor suspicious activities on the network
ANY TWO or other acceptable alternatives (2)

2.3.2 Add users to the network✓
Remove users from the network✓
Create directories containing user account IDs in order to keep track of users. ✓
Peripheral setups to give many users access to one printer or piece of hardware
Make regular backups which will include full as well as partial backups.
ANY THREE or other acceptable alternatives (3)

2.4

2.4.1 Windows 2003 Server or any suitable (e.g. Linux)✓
Simple suitable reason. For example: Modern OS which is affordable at the educational prices offered to schools(or Linux because it is free) ✓ (2)

2.4.2 Manage shared hardware/peripherals
Manage shared software
Manage Backups
Manage Security levels and passwords
ANY THREE ✓✓ (3)
(Not internet access, not virus protection)

2.5

2.5.1 A server with
two Processors
dual core processor
processor which uses hyperthreading
ANY TWO ✓✓ (2)

2.5.2 One physical processor✓ has hardware components which allow it to run a logical (virtual) processor✓ simultaneously✓. The physical and logical processors can run independently doing multiple tasks thereby improving overall performance
ANY THREE FACTS . (3)

2.5.3 Pipelining allows the next instruction for processing to be fetched✓ before the current instruction has finished executing✓
OR
Pipelining divides a process up into sections which each take the same time to execute (a Beat) ✓
Several processes, calculations or instructions can be carried out simultaneously, each at a different stages of completion✓ (2)

2.5.4 (a) The system may be slowed down✓ (1)
(b) because access to the Hard Drive is one of the slowest aspects of a system✓ (2)

2.5.5 (a) On the CPU✓ On the Motherboard ✓ (2)
(b) Any answer which implies that the number of accesses to a slower device (e.g. RAM) can be reduced by accessing a faster device (Cache) ✓✓ (2)

2.6

2.6.1 Electromagnetic interference✓
Theft and damage✓
Authenticity✓ (or any acceptable alternatives) (3)

2.6.2 because one cable required for every machine from switch to PC whereas Co-axial cable is daisy chained from one PC to the next✓
Lighter weight, easier to handle ✓(or any acceptable alternatives) (2)

2.6.3 (a) Software✓ which allows communication (or provides and interface) between the network card and the operating system✓ (2)
(b) Any suitable advice and explanation. For example: Buy new NICs. Do not use the old cards✓. They will be slow and unreliable✓ (2)
[55]

TOTAL SECTION B: 55

SECTION C: APPLICATIONS AND IMPLICATIONS

QUESTION 3: e-COMMUNICATION

3.1

3.1.1 (a) WiMax is a network standard developed by IEEE that specifies how wireless devices communicate over air in a wide area. ✓/ Worldwide Interoperability for Microwave Access (1)
(b) Provides wireless broadband Internet Access at a reasonable cost ✓over long distances. ✓ OR Can reach rural and remote areas easily and inexpensively (2)

3.1.2 People can walk around or drive around with their cell phones or laptops until they find an open wireless connection to the Internet and then use that connection to surf on the Internet. ✓✓ (2)

3.2 Any acceptable reason, For example:
Verify the material on a reputable source such as ACM (Association of Computing machinery)
Attempt to contact the author at his place of employment to verify that he is a genuine authority working for a genuine employer such as a university.
An author who uses standard bibliographical entries and proper referencing is likely to be genuine.
ANY TWO ✓✓ (2)
(Finding two authors in agreement could just mean that one has plagiarized the other, especially if they are individuals not connected with a reputable company)

3.3 A digital signature is an encrypted code✓that the sender will attach to an electronic message to verify the identity of the sender. Digital signatures will be unique to this message because it contains a hash of the message or part of the message. ✓The receiver will decrypt the digital signature. ✓The recipient then generates a new hash of the received message and compares it to the original digital signature. ✓ Companies exist on the Internet which keep a registry of Digital Signatures The Public Key used in this process is available to everyone whereas the associated Private Key is available only to the individual
ANY FOUR FACTS. (4)

3.4 Yellow lock symbol in the right hand corner of the screen. ✓
The web address of the page typically starts with https ✓ (2)
[13]

QUESTION 4: SOCIAL AND ETHICAL ISSUES

4.1

4.1.1 Computer Ethics: The moral guidelines✓ that govern the use of computers and information systems✓./ The conduct that specifies the standard for the ethical use of computers and information systems. (2)

4.1.2 Any acceptable examples, For Example:
Violating copyright by using information as it is as if it is your own (Plagiarism),
Trying to hack into other people's computers while they are on the Internet.
Vandalize websites ANY TWO ✓✓ (2)

4.2 Spyware is a program placed on a computer *without the knowledge of the user.* ✓ This software secretly collects information about the user It communicates information it collects to some outside source while the user is online. ✓ (2)

4.3 Any TWO sensible reasons ✓✓ For example:
Learners can collect information, teachers do not have to supply everything
Learners know how to do research at an early age and gain a lot of knowledge on various topics using the Internet.
e-communication can assist learners who do not have an educator. Electronic versions of lessons can be studied
In discussion groups, learners and teachers can get answer to question they have on certain topics. Admin load can be lightened through use of learning management systems. (2)
[8]

TOTAL SECTION C: 21

SECTION D: PROGRAMMING AND SOFTWARE DEVELOPMENT

QUESTION 5: ALGORITHMS AND PLANNING

5.1

5.1.1 The screen is badly designed – Any reasonable samples, for example:
Buttons not aligned, not the same size
Not top to bottom and left to right flow of information on the screen.
(any explanation to this regard)
No heading indicating what the system is about
No variation in text size in menu – heading should be bold and larger
No tooltip or help
Black spaces not used
Inconsistent with "normal" GUI design ANY TWO ✓✓ (2)

5.1.2 Difficult to choose - Any reasonable samples, for example:
Unlabelled buttons – not clear what the purpose of the buttons are
The Option text does not indicate what the choice is
The instruction "CHOOSE ANY AND ENTER" is unclear
There are two buttons – which one must be clicked?
ANY TWO ✓✓ (2)

5.1.3 Poor design- Any reasonable samples, for example:
It is unclear where the Menu window came from
It is unclear what will happen if an Option is chosen.
It is unclear what will happen if you click the buttons
ANY TWO ✓✓ (2)

5.2

5.2.1 Reduce data redundancy✓
Improved data integrity✓
Data can be shared over the network✓
Easier access. Allows non-technical users to be able to maintain data without assistance.
Can reduce development time – often easier and faster than writing a program to maintain data. (any 3) (3)

5.2.2 (a) Wrong information presented to clients ✓
Negative image of company created, loose business✓
Time wasted on trying to track down the cause of wrong output. (any valid impact) ✓
ANY TWO (2)

(b) Validation: <= 20✓
Error message: Invalid number, must be < = 20 ✓ (2)

(c) Limited duplication of data ✓
Data integrity will be in place – delete all related information when a record has been deleted. ✓
Does not allow unrelated pieces of data to be added into the table – only complete sets of data (records) (any 2) (2)

(d) InternetSessions
✓ correct fields, ✓ new field unique as PK ✓, correct FK ✓ correct foreign key

Field Name
SessionNo (PK)
Date of session
Starting time
End time
MB downloaded
Amount
AccountNumber (FK)

UsersTable
✓ correct fields, ✓ correct primary key

Field Name
Name
Group
Total amount owed
AccountNumber (PK)

(6)

5.3
1. Type in the first name and the last name
2. Counter ← 0✓
3. repeat the following steps✓(loop)
3.1 Increment counter✓
3.2 twoLetters ← extract two letters from first name using counter✓
3.3 username ← last name + twoLetters
3.4 Open the text file✓
3.5 Set flag to false✓
3.6 While not end of text file ✓(loop)
Read name from text file ✓
If username = name from text file✓
Set flag to true
Close text file
3.7 until flag = false
3.8 Open text file and append new username✓ (10)

5.4 Yes. ✓ Encryption is a process of converting readable data into unreadable characters. ✓ To keep information confidential / prevent unauthorized access✓ (3)

5.5

5.5.1 (a) Overflow ✓ (1)

5.5.2 (b) The integer being represented falls outside of the representable range of the of the data type ✓because it uses a fixed number of bytes (Delphi , Java 4 bytes) ✓ (2)

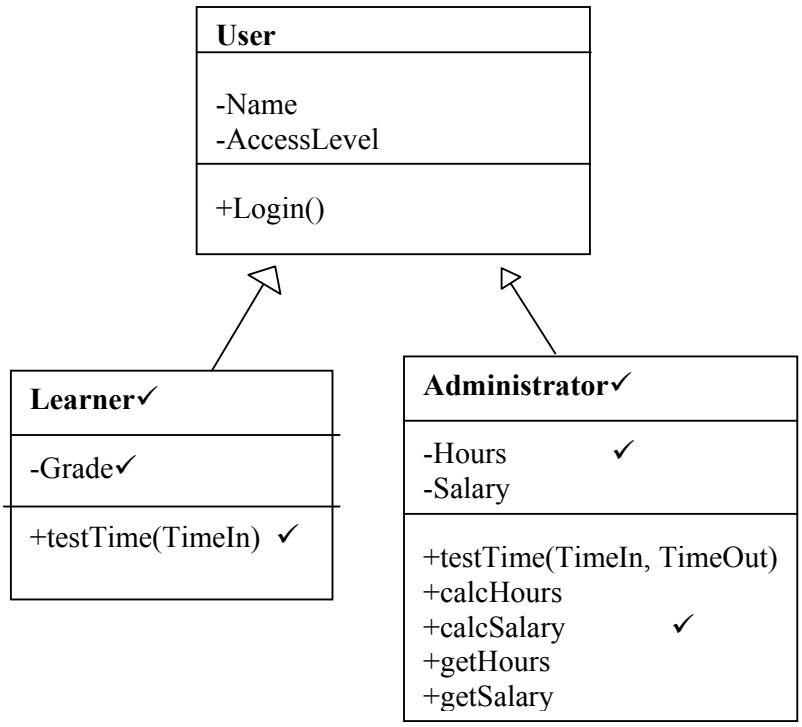
5.6

5.6.1 (a) Polymorphism: The ability of objects to respond differently to the same method call. ✓Example: There are two LogIn methods. The object calling the method will determine which method will be executed. ✓ (Any explanation that carries this information) (2)

(b) Encapsulation: Keeping the data (attributes) and the behavior of an object private. ✓ Example: declare the data (attributes) as private. Make use of set-methods to set the value of an attribute and get-methods to retrieve the value of an attribute of the class. ✓ (any explanation that carries this information) (2)

5.6.2 (a) You do not have to program the activities of the superclass – it can be inherited. ✓ Example: all the users will log in (activity) The login method can be inherited from the superclass. It does not have to be programmed for each subclass. ✓ (2)

(b)



(6)
[49]

TOTAL SECTION D: 49

SECTION E: INTEGRATED SCENARIO

QUESTION 6

6.1

6.1.1 (a) ADSL or ISDN possible reason: affordable, distance between schools are short✓
(b) Diginet or satellite Possible reason: Too expensive, distances to cover too short ✓
Accept any viable justified variation (2)

6.1.2 (a) Internet Service Provider✓. Sells "connectivity" to users allowing to connect to the Internet ✓ (2)
(b) Yes – They can use the same software which should cut down on errors. Accept any viable alternative ✓✓ (2)

6.2

6.2.1 To send data packets around the internet by intelligently selecting paths to other routers (1)

6.2.2 Yes✓ if they want to connect to the internet✓. (2)

6.2.3 CSMA/CD✓ (1)

6.2.4 A switch manages collisions✓(Award a mark for any answer which implies this)
It intelligently establishes a connection between sender and receiver by creating a temporary network segment dedicated to that communication ✓ (2)

6.3

6.3.1 ✓ Statement of a sensible issue
✓ Sensible point with regard to the issue
For example:
WHERE will the equipment end up? ✓
Some of the components pose an ecological threat if dumped ✓
This is morally wrong. Passing the problem on to a third party who may do nothing constructive is not acceptable. (2)

6.3.2 (a) Any reasonable answer. For example: YES, because the equipment may need repair, is probably very slow and will have a limited life ANY ONE ✓ (No mark for Yes or No with no reason) (1)
(b) About 3 to 4 years ✓. That equipment can be moved to a less demanding area of the campus or donated. A rational method of safe disposal should be investigated for all equipment. ✓ (2)

6.3.3 Any reasonable answer. For example:
Poor lighting may cause eye strain ✓
Poor seating may cause back problems✓,
Poor seating may cause carpal tunnel syndrome ✓ (3)

6.3.4 Any suitable reasons. For example:
Positive – Access to literacy, skills education
Negative – Cultural effect on rural community, exposure to nefarious Internet material (2)

6.4

6.4.1 Any suitable equipment and reason. For example:
Smartboard / Interactive whiteboard✓ – teaching awareness using presentation software✓
Place an information terminal at an Information Centre, library or shopping centre ✓ - provide advice and contact numbers for help for HIV /AIDS ✓ (4)

6.4.2 (a) Any suitable device and justification. For example; A touch sensitive screen which is graphically based to favour those with limited education or reading skills✓ (1)
(b) Any suitable device and justification. For example: Cellphones. Most people have cellphones so generate sms. ✓ (1)

6.5

6.5.1 ANY THREE suitable items and explanations. For example:
Hackers ✓ Could break into websites and replace content with abusive items ✓
Spyware ✓ Extracting information without permission ✓
Adware
Chatrooms ✓ Children can become the victim of a stalker or predator ✓
Phishing, Identity theft, pornography, etc (4)

6.5.2 (a) SPAM is bulk unwanted mail ✓ (1)
(b) The company identifies that a huge amount of mail originates from one users ✓
or
they identify the same or very similar content in a large number of E-mails ✓
ANY ONE (1)
(c) Mail identified as SPAM can be flagged by the company ✓and then allow the user to decide to delete it or identify it to the company as legitimate mail ✓OR
The company can ask all senders of e-Mail to given recipient to first register themselves with the company ✓as a legitimate sender before allowing mail to go through ✓
OR
All mail flagged as SPAM can be deleted ✓ (2)

6.6

6.6.1 To guard the network's resources against unwanted intrusion ✓ by hackers , and or users of other networks.✓ (1)

6.6.2 (a) The DNS registers Names which form the recognizable part of a site's URL ✓, e.g. http://**www.ruralschools.org.za**/index.html ✓ (2)
(b) :**www.ruralschools.org.za** ✓The name should be picked up easily by the Search Engine search string entry✓ (2)

6.6.3 (a) The Domain Name is mapped onto an IP Address ✓✓. (2)
(b) An IP address, 192.14.23.211✓✓, (2)

TOTAL SECTION E: 45

FINAL TOTAL 180