Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

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INFORMATION TECHNOLOGY P2 MEMORANDUM

MARKS: **180**

This memorandum consists of 11 pages.

SECTION A: MULTIPLE CHOICE QUESTIONS

QUESTION 1

1.1	C	The BIOS	(1)
1.2	D	hard drives.	(1)
1.3	C	A 3G card	(1)
1.4	A	The chip on the motherboard which connects the fast components together.	(1)
1.5	D	IPX	(1)
1.6	B	can daisy chain up to 127 devices	(1)
1.7	B	Defensive programming	(1)
1.8	A	SELECT * FROM music_table WHILE artist = “UB40”	(1)
1.9	C	Backups	(1)
1.10	D	To protect a network, preventing unauthorized users and software from accessing it	(1)
			[10]

1.11	G	Social Networking	(1)
1.12	D	Temporary storage inside the CPU	(1)
1.13	K	Authenticity, validity, verification	(1)
1.14	B	Scramble text or data into a new format	(1)
1.15	E	Associated with compressed files	(1)
1.16	L	Email trying to get you to click a link to site that looks official but is fake	(1)
1.17	A	Infected by a virus	(1)
1.18	C	Read only memory	(1)
1.19	F	Operating system for mobile devices	(1)
1.20	H	Free operating system for PCs	(1)
			[10]

TOTAL SECTION A: 20

SECTION B: HARDWARE AND SOFTWARE

QUESTION 2

2.1 2.1.1 Machine 1
Better processor
Better hard drive
Better operating system
More RAM√√√ (Any 3) (3)

2.1.2 Machine 2 √
The receptionist does not need a high powered machine for basic word processing/spreadsheets, etc. √ (2)

2.1.3 The laptop √
He would use it at home and at the surgery. Need mobility. √ (2)

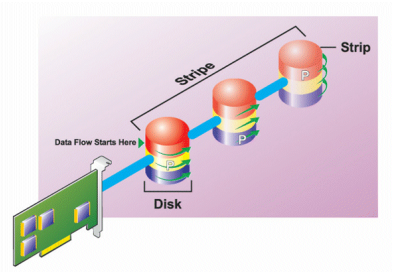
2.1.4 Ergonomics relates to the study and design of products so that they are safer and more comfortable to use. √ (2)

2.1.5 The functions of the operating system are:
- To create an interface for the control of the computer √
- Managing resources, i.e. memory, disk, processor √
- Scheduling/managing the operation of other software (Any 2) (2)

2.1.6 AMD, Motorola, etc. √ (1)

2.1.7 (a) Redundant Array of Inexpensive (Independent) Disks √ (1)

(b) To improve speed √ and reliability √ of storage (2)

(c) 

Striping with parity – data is broken into blocks and distributed between the disks √. The controller generates and records a parity block which is also distributed between the disks √. Should a disk fail, the data on the failed disk is rebuilt from the remaining disks √. (3)

2.1.8 The network card can run at speeds of 10 or 100Mbps √ (1)

2.2 2.2.1 The FSB connects the high speed components more especially the CPU and RAM √. (1)

2.2.2 (a) The North bridge √ and the South bridge √ (2)

(b) √√√√
North: RAM, CPU, AGP, PCI-x (Any 1)
South: Standard I/O, PCI, USB, Firewire (Any 1) (4)

2.2.3 (a) The BIOS chip stores a small program in ROM which is used to start the PC √. It controls hardware at the lowest possible level √. (2)

(b) The program is loaded into RAM by the CPU √, hardware is tested √, the Operating System starts to load from which time the O/S takes control √ (3)

2.2.4 (a) High speed memory √ built in to the CPU which temporarily stores instructions and data √ likely to be used next by the CPU √ (3)

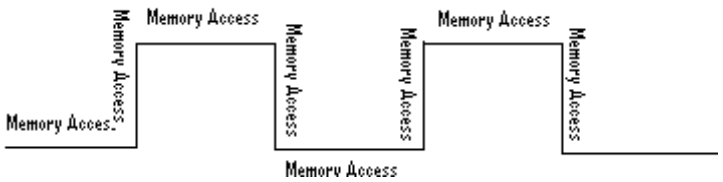
(b) Disk cache, internet cache √ (one only) (1)

2.2.5 (a) Virtual memory √ (1)

(b) The O/S loads itself and programs into memory (RAM) until RAM is full. When RAM is full and another program is loaded, the O/S swaps parts of the running programs/data to the hard drive √. The bits swapped to the hard drive are called pages √. Pages must be fetched again from the hard disk before they can be used √ and when they are fetched, other pages must be sent to the hard drive. (3)

(c) If RAM is too small, the O/S would be swapping pages constantly √ to the hard drive, thus slowing the machine down drastically √. (2)

(d) Thrashing √.



(1)

2.2.6 (a) Memory access takes place on each edge of a clock cycle √. This means that memory is accessed 4 times per clock cycle. The transfer rate will be 1064MHz, or 4 x 266 MHz √. (3)

(b) Light pathways to carry signals √ (1)

2.2.7 **√ for the port and √ for the device**
PCI-x – video, network,, etc.
USB – any USB device
Firewire – digital video
Etc. (Any 2) (4)

2.2.8 (a) **√ for the improvement and √ for the description**
Increase in register size – larger the register the bigger the number the CPU can work with.
Increased clock speed – the faster the clock speed the more the processor can do in a given time.
Clock multiplication – this allows the CPU to run at speeds faster than the supporting motherboard.
Cache – reduces the idle time of the CPU.
Instruction set – RISC designs are faster than CISC because their instructions are all the same length.
Hyperthreading – appears to the O/S as if there are more than one CPU.
Multi-core technology – the physical chip contains more than one CPU.
Reducing the transistor size – can then fit more in the same space and hence add more cache, increase register size, etc.
Additional special instructions – like graphics, sound, etc. (Any 2) (4)

(b) In terms of the machine cycle, a new instruction can be fetched before a previous one is complete √. This means two or more instructions are being processed at one time √. (2)

TOTAL SECTION B: 55

SECTION C: APPLICATIONS AND IMPLICATIONS

QUESTION 3 e-COMMUNICATIONS

3.1 It is unethical to send out what could be construed as junk mail √. (1)

3.2 Spam √ (1)

3.3 Distributed company – a company can now be distributed across the globe and can function successfully. √√
Smaller workforces – increased efficiency means less people are doing the jobs of many people. √√
Global markets and marketing – the web allows easy and cheap marketing as well as targeted advertising. √√ (Any 1) (2)

3.4 **For the customer**
Purchases can be done anywhere there is internet
- o any time√
- o cheaper because of lower overheads√
- o comparative shopping is easy√
- o customer reviews and recommendations√ (Any 2)

For the business
- o lower stock holding√
- o reduced overheads√
- o not limited by distance√
- o electronic catalogues cost less and easy to produce√
- o shopping around the clock√ (Any 2) (6)

3.5
- o on-screen keypad√
- o second password where letters typed change each time√
- o once-off passwords sent via email or sms√
- o sms when a transaction takes place on your account√
- o automatic logoff after a period of inactivity√ (Any 2) (2)

3.6 A virus is a small, self-replicating program √ that infects executable files √.
An anti-virus program protects against these threats √. (3)
[14]

QUESTION 4 SOCIAL AND ETHICAL ISSUES

4.1 No √. It is illegal to use copied software because of copyright on the software √. (2)

4.2 Spyware records sites, form details, etc. in the background and sends the information to the writer of the spyware √. This is all done without your permission which is unethical √. (2)

4.3
- A reputable institution should support the web site (Affiliation)
- The web site should list the author and credentials, cross reference (establish authority)
- The information should be up to date.
- Contact the author (Any 2) (2)

4.4
- A form of long-distance health care
- Diagnoses can be made by listening to audio and viewing video
- Using telecommunication to interact with medical staff at remote sites
- Remote operations (Any 2) (2)

4.5 4.5.1 An RSS feed gives the user updates at regular intervals √ of items to which they are subscribed √. (2)

4.5.2
- saves time√
- the user remains anonymous√ (Any 1) (1)

[11]

TOTAL SECTION C: 25

SECTION D: PROGRAMMING AND SOFTWARE DEVELOPMENT

QUESTION 5 ALGORITHMS AND PLANNING

5.1 5.1.1
- buttons are not lined up √
- text goes off the screen√
- layout not logical. Should flow left to right, top to bottom√
- etc. (Any 2) (2)

5.1.2
- menu options don't tell what they are for√
- button captions are meaningless√
- etc. (Any 2) (2)

5.2 5.2.1
- data is centralized √
- data is organized √
- redundancy is minimised√
- data can be retrieved quickly√
- a database can allow for data to be tested for accuracy at input√ (Any 3) (3)

5.2.2 Patient table – ID √
Encounter table – ID or PatientID √
Provider table – ID √ (3)

5.2.3 To minimise duplication in the data √. (1)

5.2.4 (a)
```
SELECT * √ FROM patient √ ORDER BY surname √
```
(3)

(b)
```
SELECT lastname, firstname, streetnumber,
  streetname, city √
FROM patient √
WHERE city = edtCity.text √
ORDER BY edtCity.text √
```
(4)

(c)
```
SELECT lastname, firstname, treatment √
FROM patient, encounter √
WHERE patient.ID = encounter.patientID √
ORDER BY date DESC √
```
(4)

5.3
```
Surname <- name of client
A_character <- surname[random(length(surname)+1)] √
Year <- year of birth
Time <- get system time

If time < year then √
  B_characters <- string(year mod time) √
Else
  B_characters <- string(time mod year) √

Password <- surname[1] √ + a_character √+ B_characters
√
```
(7)

5.4 5.4.1 Object Oriented Programming √ (1)

5.4.2
```
TCard = class          √
fPicture: string;      √
iValue: integer;       √
sSuite: string;        √
private                √
procedure shuffle;     √
public
end;
```
(6)

TOTAL SECTION D: 36

SECTION E: INTEGRATED SCENARIO

QUESTION 6

6.1 6.1.1 The topology refers to the physical layout of the network √. (1)

6.1.2 bus/ring/star √ (Any 1) (1)

6.2 6.2.1 Client – use but do not provide network resources √
Server – provide network resources √
Peer – use and provide network resources √ (3)

6.2.2

	Client/server	Peer-to-peer
Performance	Slow √	Faster √
Security	Limited √	Good √

(4)

6.2.3 Client/server √ because of better security of confidential information √ (2)

6.2.4 All traffic entering a hub is broadcast to all ports √ while traffic coming in on a switch port is routed to the port to which the destination machine is connected. √ (2)

6.3 6.3.1 The lock in the browser as well as the address starting with HTTPS √√. (1)

6.3.2 Encryption is the encoding of a message or data into a form that is not readable. √
Decryption is the decoding of the data back into its readable form. √ (2)

6.4 The validity of information on the net can be determined by asking three questions:
- Is the site authentic? IE is the data from whom or where it says it comes from √
- Is the site valid? IE is the data valid or not. Is the source valid or not. √
- Can the data be verified? Does the data correlate with other sources. √ (3)

6.5 6.5.1 Make backups√
Save regularly√
Use passwords√
Use protective hardware√
Protect your computer√
Physically secure your computer√
Use audit trails√ (Any 3) (3)

6.5.2 Use a firewall√ (1)

6.5.3 Each protocol on a TCP/IP network has an associated port number √. One can block a port number on the network hence blocking that protocol √. (2)

6.6 6.6.1 Any two √√ examples where someone pretends to be the doctor and performs transactions on his behalf. (2)

6.6.2 (a) social engineering is activities that attempt to con and deceive people √ into giving out confidential information √. (2)

(b) Challenge people to prove their identity. √
Be aware of shoulder surfers who try to get your password. √ (2)

6.7 6.7.1 New viruses come out all the time and for best protection one must update the anti-virus software every day. √ (1)

6.7.2 A virus is self-replicating √ code which attaches itself to an executable √, its purpose being malicious √. (3)

6.7.3 Files corrupted√
O/S runs slow√
Anti-virus warns of an infection√
Files or programs disappear √
Strange messages on the screen√
Unusual activity on the internet√ (Any 3) (3)

6.8 6.8.1 It arranges all the files back into contiguous blocks √ on the hard drive rather than the files being fragmented over the drive. (1)

6.8.2 Files are constantly being added and deleted from a hard drive√. Files no longer fit into spaces where the whole file can reside √ so it is split across different areas of the disk √, thus becoming fragmented. (3)

6.8.3 Archive√
Hidden√
System√ (Any 2) (2)

TOTAL SECTION E: 44

GRAND TOTAL: 180