



NATIONAL SENIOR CERTIFICATE EXAMINATION  
NOVEMBER 2014

**INFORMATION TECHNOLOGY: PAPER I**

**MARKING GUIDELINES**

Time: 3 hours

180 marks

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**These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.**

**The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.**

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**SECTION A            SHORT QUESTIONS****QUESTION 1            MULTIPLE CHOICE**

- 1.1    D     Adobe Reader
- 1.2    C     OOP design
- 1.3    B     Denial-of-service
- 1.4    D     Chipset
- 1.5    C     If then else statement
- 1.6    D     The Front Side Bus (FSB) allows you to connect additional devices to a computer.
- 1.7    D     Overflow
- 1.8    D     Flaming
- 1.9    C     IrDA
- 1.10   B     Defragmenting a disk will increase the amount of RAM available.

**[10]****QUESTION 2**

- 2.1    Netiquette
- 2.2    Plug-ins
- 2.3    Extranet/VPN
- 2.4    POS system (Point of Sale)
- 2.5    Synchronise
- 2.6    Cap
- 2.7    Bandwidth
- 2.8    Digital Divide
- 2.9    Semantic Web
- 2.10   Botnet/Zombie army

**[10]****QUESTION 3**

- 3.1    3.1.1    Modular design – It means the computer you buy can be put together in pieces with your requirements in mind. (2)
- 3.1.2    Flexible; easier to upgrade, easier to repair. (2)
- 3.2    CPU speed – The faster the CPU speed, the more instructions can be processed.  
        Register size – The more bits that can be simultaneously handled, the more that can be processed.  
        Number of cores – If there are more cores, programs can be split into threads to achieve true concurrency.  
        Size of cache – The larger amount of cache, the less accessed from slower RAM.  
        (ANY THREE) (6)
- 3.3    3.3.1    Speed of the bus technology; the latency of the data itself / access time of the device. (2)
- 3.3.2    No moving parts, do not need to wait for heads to share or track to spin under head. (2)

**[14]**

**QUESTION 4**

- 4.1 4.1.1 Data – number of items disposed (any number or count)  
Information – the average number of items disposed per month (any calculation to summarise ) (2)
- 4.1.2 Advantages – portable /smaller than a laptop/turned the world into a 'global village' because of e-communication  
Disadvantages – talk time, standby time , battery life, capacity (4)
- 4.2 Need to write programs in IT– better/fuller versions on a laptop. Keyboard does not take up part of screen for the programming IDEs. ANY VALID TWO that relates the demands of the Grade 12 IT syllabus to the Laptop/Netbook. (4)
- 4.3 4.3.1 **SaaS** – Designed for end users, software can be leased on pay as you go model.  
**Paas** – Tools and services for quick development of apps, e.g. creation of web pages.  
**Iaas** – Hardware and software to power server, storage networks, etc. Saves buying expensive servers and software. (6)
- 4.3.2 (a) Paas (1)  
(b) SaaS (1)  
(c) Iaas (1)
- 4.3.3 (a) BitTorrent uses a swarm of many host computers to distribute large amounts of data over the Internet. (2)  
(b) NO – security will be compromised as any machine can be used as a host  
OR  
YES – the transfer of data will be faster (2)
- 4.3.4 Virtualisation is the process of creating logical computing devices from available physical resources, unlike cloud computing which uses the Internet's resources for applications of storage. (2)
- 4.4 ANY TWO + description
- The display – brightest level drain your battery  
– set it to automatically switch off
  - Multitasking – the CPU drain the battery when running multiple applications. Close some applications
  - GPS – you only need it for maps, so keeping it on, drains the battery
  - Bluetooth and Wifi – turn them off to maximise battery life
  - Media – playing music uses up power (4)
- 4.5 Each OS use different architectures and has different ways of interfacing with software so a different 'version' has to be written for each OS platform.  
OR  
each operating system manages functions differently. These being:
- managing resources
  - loads and runs programs
  - provides a user interface
- Allocate marks if differences are clearly explained. (3)

**[32]**

**QUESTION 5**

- 5.1 5.1.1 A modem converts analog signals to digital signals and vice versa . This network is all digital. (2)
- 5.1.2 Router (1)
- 5.2 Accept any THREE advantages of a network
- Easier to share data and information about recycling– transfer rather than copy to flash/DVD
  - Cost effective to share hardware resources and software. Any of the devices could print to one printer.
  - Facilitating communication, e.g. e-mails, instant messaging, blogs, etc. Employees could email each other.
  - Easier to backup the data on the NAS server
- Also accept any other suitable advantage. (3)
- 5.3 5.3.1 Accept any ONE disadvantage of WLAN
- Security is low
  - Range is limited
  - Data transfer rate is slow
  - Reliability is questionable
  - Shared bandwidth (1)
- 5.3.2 UTP cables are easier to install/don't need expertise to install UTP has the capability to cancel interference (1)
- 5.3.3 Switch (1)
- 5.4 5.4.1 It is a server that acts as an intermediary between a workstation user and the internet so that the enterprise can ensure security, administrative control and caching service. (2)
- 5.4.2 Proxy server (2)
- It can cache web pages and ensure security for the company
- 5.5 Accept any TWO valid reasons:
- Users from other companies might try to access the server for some reason, e.g. gain access to personal data
  - It prevents unauthorised connections from outside the company, e.g. the opposition
  - Communication from software on the server to any outside source is restricted/prevented (2)
- 5.6 TCP – transferring emails web pages and downloading files UDP – transfer voice and video data (2)

- 5.7 5.7.1 NO  
 Poor security it would use bandwidth (3)
- 5.7.2 NO They would not need to log onto the company network as Google Drive would be available over the Internet. (3)
- 5.8 5.8.1 Backup – copy of data  
 RAID – protects against hardware failure  
 Should all hard drives crash, then a backup would still be needed. (4)
- 5.8.2 Accept any THREE ways of verifying the trustworthiness of data/information
- Check if data is authentic  
 Is the data from where it says it comes/Author? } One point
  - Check data for validity/Is source valid? }
  - Is data up-to-date/current?
  - Does the data correlate with other sources/correctness? (3)
- 5.9 5.9.1 A static website contains information that does not change and therefore remains the same, or static, for every user of the site. (1)
- 5.9.2 Dynamic website is customisable – content changes for each user.  
 Static – the page is the same for each user. (2)
- 5.9.3 Created by software running on the web server processes scripts, accesses database and then create HTML page to be sent to user's browser. (2)
- 5.9.4 Web 2.0 (1)
- 5.10 Faster switches – upgrade to switch to transfer data at a faster speed  
 Replace UTP cables with fibre optic cables – data transfer in not limited when using fibre  
 Replace UTP with better category cables – data will be transferred faster  
 ANY TWO correct suggestions (4)

**[40]**

**QUESTION 6**

6.1 Any TWO

- Reduce printing to save paper
  - Recycle printer cartridges to save ground water systems
  - Use energy efficient devices to reduce carbon footprint
- (4)

6.2 *Level marking*

Candidate must make TWO well explained statements each

Possibilities: Yes – If controlled by government all will be held responsible

Laws can be passed that all companies must adhere to

All are affected by pollution hence it is a problem in the governing of a country

I think all should be responsible, our duty to care for the environment

No • Difficult to police

- Need better laws
- Need companies to recycle, of which there are few
- Our infrastructure is not good enough
- Rural areas have no access to recycling

ANY TWO VALID REASONS.

(4)

6.3 6.3.1 Yes. For security reasons.

OR

No. Because they are rehabilitated individuals, they should be allowed to have a clean slate.

(3)

6.3.2 The Secure Socket Layer (SSL):

- Customer makes a connection abc.com on a SSL port
- Abc.com sends back its public key to the customer
- If the customer decides to trust the certificate, the customer will send to abc.com his public key
- Abc.com then create a unique hash and encrypt it
- The customer's browser will decrypt the hash
- Customer and website can now securely exchange information.

(6)

**[17]**

**QUESTION 7**

- 7.1 7.1.1 So that each record is unique. (1)
- 7.1.2 To provide links between tables. (1)
- 7.1.3 There cannot be more than one movie with the same title and Director. (2)
- 7.2 7.2.1 (a) A field that depends on a non key field. (1)
- (b) To prevent an update anomaly of having to change both the fields as they are related. (2)
- 7.2.2 Each movie can have multiple titles and producers and still be unique. (2)
- 7.2.3 Movie (ID, Title, Director, ReleasedDate, length, rating )  
ActorProdMovie (ActorName , ProducerName, ID) (8)
- 7.3 7.3.1 Data validation ensures that data is correct by imposing a set of rules that try to make sure data matches expected criteria – e.g. gender can only be 'M' or 'F' so you can validate it. (Also accept 'to ensure entry of valid data' if accompanied by explanation/example; if valid example given award 2 marks) (2)
- 7.3.2 Presence check (data is entered)  
Range check (lies between 1 and 10)  
Type check (is on integer) (3)
- 7.4 7.4.1 Count the number of movies by each director whose rating is above 5. (3)
- 7.4.2 WHERE reduces the rows in a table,  
e.g. SELECT \*  
From tblmovies  
WHERE rating = 5  
Will only produce rows who have 5 as a rating  
HAVING is criteria for a GROUP BY if we wanted all directors have made more than 5 movies  
SELECT director COUNT (\*)  
FROM tblmovies  
GROUP BY director  
HAVING COUNT (\*) >5 (6)
- [31]**

**QUESTION 8**

Mark the concepts. Candidates can use either pseudocode or any mix of natural language. Deduct 2 marks if programming code has been used.

```
number ← false
valid ← true
if (username = password)
    valid ← false
if (password length < 9)
    valid ← false
while number = false and not the end of the string password
    if character at loop in password is a number
        number ← true
    loop + +
end while
if valid = true and number = true
    return true
else return false + 2 for efficiency
```

1 Check for username not password  
1 Check length > = 9  
3 loop to check if password contains a number  
2 return a boolean value correctly  
2 combine all results so that any false value returns false  
2 efficient code

**[11]**



**QUESTION 9**

- 9.1     getFileName or toString (1)
- 9.2     None as they are all dependent on fields. (2)
- 9.3     String (1)
- 9.4     **Java or Delphi**

One mark for class header  
 One mark for 'Private' and 'Public'  
 Two marks for the correct fields  
 Two marks for the correct methods

Movie - itemCode int -costPrice real/double - title string - fileName string + Movie (i int, c double, t string, f string); + void setPrice (p double) + void setTitle (t string) + string getFileName() + string toString() + double getSalesPrice()
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Accept Procedures and Functions in place of void and typed methods (6)

- 9.5     YES – the value of VAT is needed to calculate the Sales Price  
 OR  
 NO – we can use the value of 14 instead of storing it as a variable (2)
- 9.6     Database – provides security, can be accessed easily using SQL, can be scaled to a store more information, provides backup, structures data logically ANY TWO.  
 OR  
 Textfile – file will be small, can be opened with any application, will run faster than a database ANY TWO (3)

**[15]**

**Total: 180 marks**