

NSC 2016 CHIEF MARKER'S REPORT

| | | | |
|-----------------------------|------------------------|------------------|------|
| SUBJECT | INFORMATION TECHNOLOGY | | |
| PAPER | 2 | | |
| DATE OF EXAMINATION: | 24-11-2016 | DURATION: | 3hrs |

SECTION 1: (General overview of Learner Performance in the question paper as a whole)

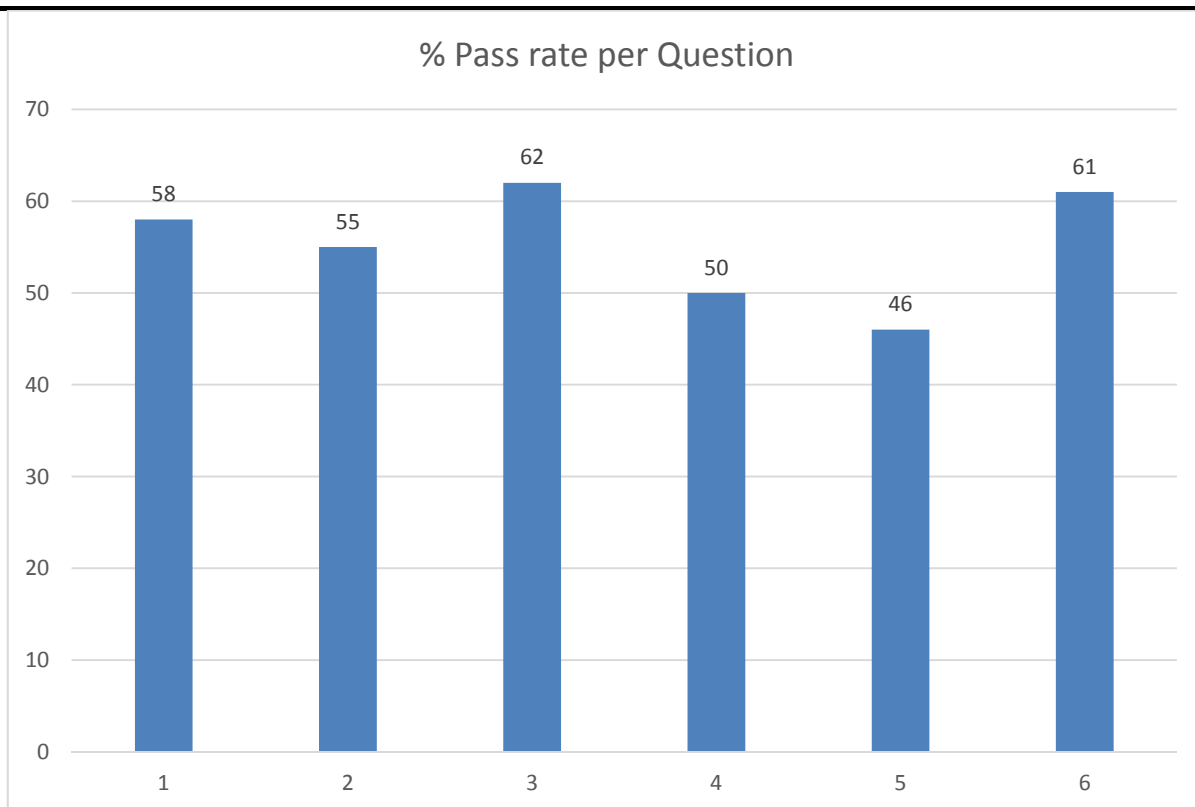
A total number of 289 candidates sat for the National Senior Certificate exam in Information Technology. This report is based on the raw marks obtained at the marking centre. It takes into consideration the responses by all the candidates.

The average pass rate for the paper was 55%

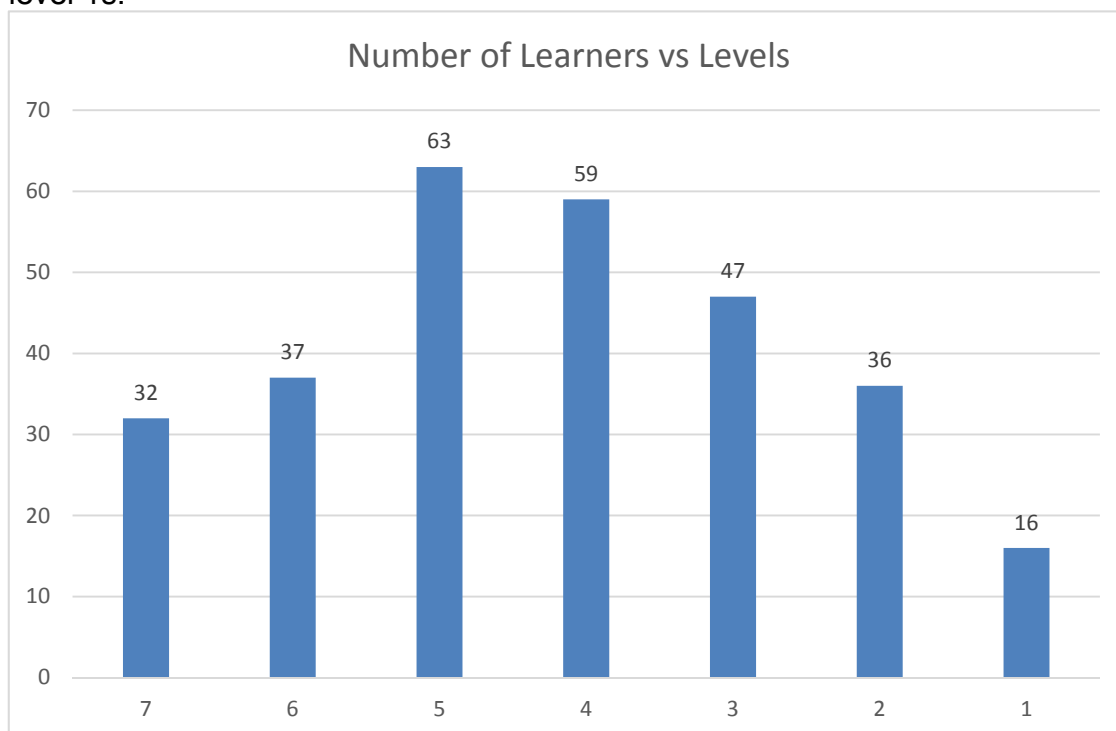
The paper was made up of the 6 sections according to the CAPS requirements. This has been the style of the paper since the introduction of this curriculum.

The hardest question was question 5 and the most passed was question 3.

| Average mark from all the learners : | | 55% |
|---|---|------------------------------|
| QUESTION | TOPIC OR ASPECT TESTED | AVERAGE % FROM SAMPLE |
| 1 | Short Questions | 58 |
| 2 | Systems Technologies | 55 |
| 3 | Communication and Networking Technologies | 62 |
| 4 | Data and Information Management | 50 |
| 5 | Solution Development | 46 |
| 6 | Integrated Scenario | 61 |



The highest number of levels achieved was level 5 and the smallest number were the level 1s.



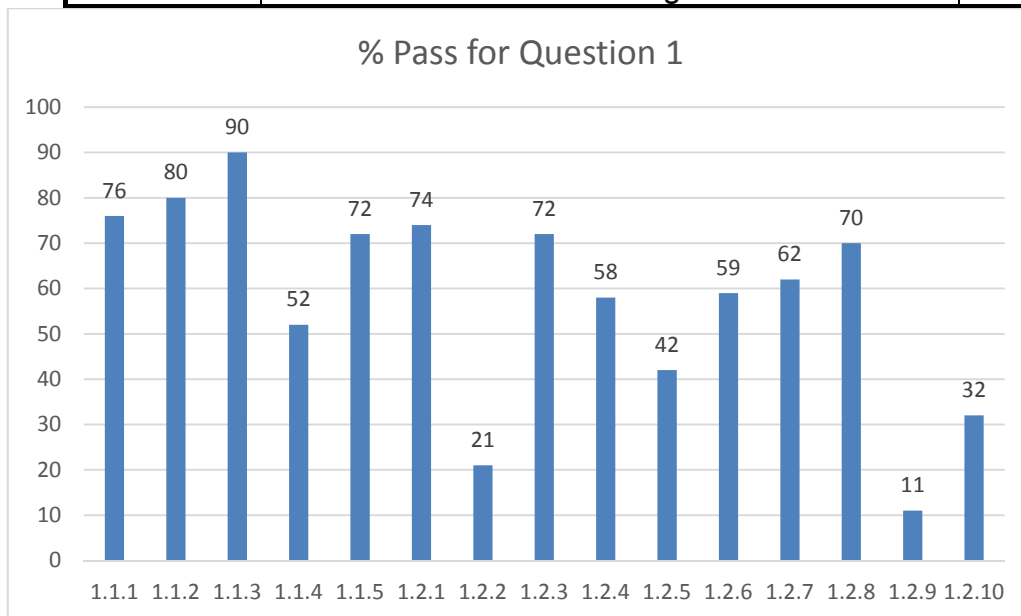
A slight decrease in the number of level 1s has been achieved compared to last year.

SECTION 2: Comment on candidates' performance in individual questions
(It is expected that a comment will be provided for each question on a separate sheet).

QUESTION 1

- (a) General comment on the performance of learners in the specific question.
Was the question well answered or poorly answered?

| Average mark from all the learners : | | 58% |
|---|---|-----------------------|
| SUB-QUESTION | TOPIC OR ASPECT TESTED | AVERAGE % FROM SAMPLE |
| 1.1.1 | Data and Information Management | 76 |
| 1.1.2 | Social Implications | 80 |
| 1.1.3 | Communication and Networking Technologies | 90 |
| 1.1.4 | Data and Information Management | 52 |
| 1.1.5 | Solution Development | 72 |
| 1.2.1 | Data and Information Management | 74 |
| 1.2.2 | Internet Technologies | 21 |
| 1.2.3 | System Technologies | 72 |
| 1.2.4 | Social Implications | 58 |
| 1.2.5 | System Technologies | 42 |
| 1.2.6 | Internet Technologies | 59 |
| 1.2.7 | System Technologies | 62 |
| 1.2.8 | Communication and Networking Technologies | 70 |
| 1.2.9 | Social Implications | 11 |
| 1.2.10 | Data and Information Management | 32 |



Poorly answered questions were
1.2.2, 1.2.9 and 1.2.10

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

This work is new technologies that are not covered well by the learners because they do not appear in the majority of the books used by the learners.

(c) Provide suggestions for improvement in relation to Teaching and Learning

The learners should be encouraged to explore a bit more outside the curriculum as it is one of the requirements.

(d) Describe any other specific observations relating to responses of learners

In addition to learners being Give one Word/Term they should also be encouraged

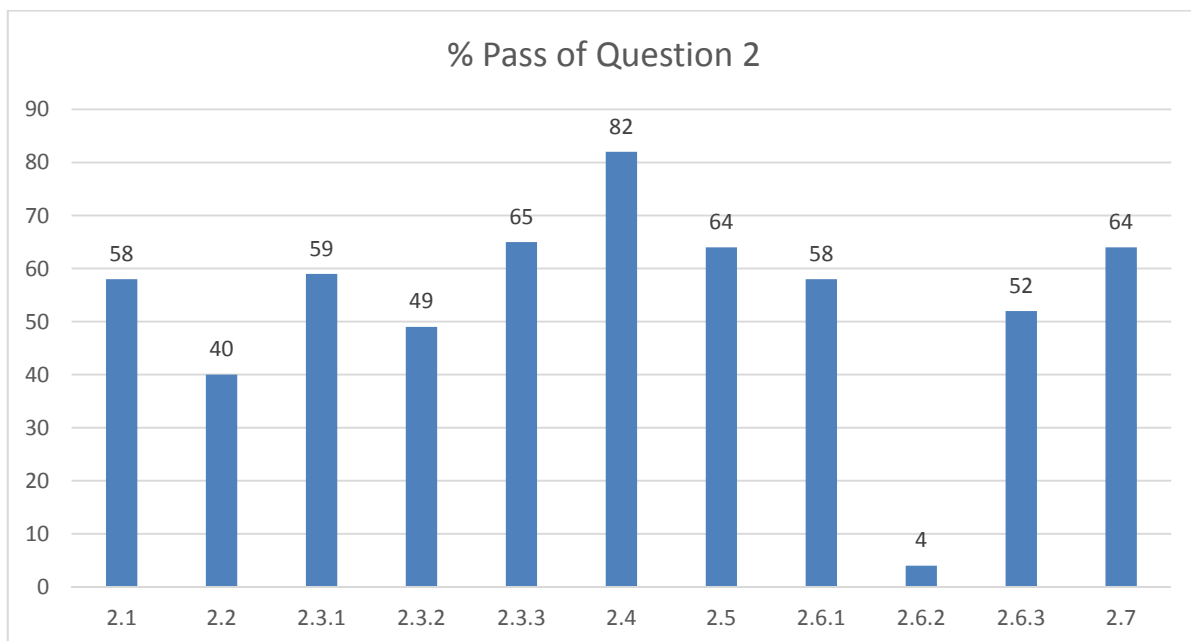
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

Learners should be encouraged to learn as many definitions and terminology of the subject as possible.

QUESTION 2

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

| Average mark from the sample of 100 : | | 55% |
|--|-------------------------------|------------------------------|
| SUB-QUESTION | TOPIC OR ASPECT TESTED | AVERAGE % FROM SAMPLE |
| 2.1 | Systems Technologies | 58% |
| 2.2 | | 40% |
| 2.3.1 | | 59% |
| 2.3.2 | | 49% |
| 2.3.3 | | 65% |
| 2.4 | | 82% |
| 2.5 | | 64% |
| 2.6.1 | | 58% |
| 2.6.2 | | 4% |
| 2.6.3 | | 52% |
| 2.7 | | 64% |



Most of the questions in this section were answered well except for questions 2.2 and 2.6.2

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

2.1: Most learners answered well, but some did not answer the question keeping in mind that the question asked the TASKS the BIOS is responsible for.

2.2: Most learners got at least one mark. The stronger learners got three marks. Most did not state the swapping back from virtual memory to RAM when needed again.

2.3.1 Most learners got at least one mark.

2.3.2 Hyperthreading is not in CAPS so most learners answered multithreading which was not correct, but the memo was amended to allow markers to give full marks (2) for mentioning multiple threads – which most learners included in their answers.

2.3.3 Most learners said that video card generates own graphics, which was allocated one mark. They did not specify that it frees up the CPU to do other processing which was expected for the second mark.

2.4 Most learners answered this question well.

2.5 Learners mustn't confuse hot swappable and plug and play terms

2.6.1 RAID is not in CAPS, so the memo was amended to accommodate learners' answers, because it is mentioned in textbooks. Most learners mentioned duplicate copy (one mark) on multiple disks (another mark). Most learners got it right.

2.6.2 No learners got this question correct. The memo wanted techniques specifically for the improvement of the HD which involves improves shock resistance and his read/write heads moving away from the plates.

2.6.3 Learners had trouble answering this question, but most learners could name at least one advantage. More time should be given for learners to explore new technologies.

2.7 Most learners could answer this question.

| |
|---|
| (c) Provide suggestions for improvement in relation to Teaching and Learning |
| Teachers must guide learners to read and understand the questions carefully and to identify WHAT is actually asked while teaching theory. |
| (d) Describe any other specific observations relating to responses of learners |
| Learners were not very confident when answering questions, evidenced by some questions which were not attempted at all. |
| (e) Any other comments useful to teachers, subject advisors, teacher development etc. |
| They must then ensure that they answer the questions specifically and not just in broad terms. Some concepts are typical of this question, eg. Virtual memory, cache memory, plug and play. These concepts must be discussed with learners in detail. |

QUESTION 3

- (a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

| Average mark from the sample of 100 : | | 62% |
|--|--|------------------------------|
| SUB-QUESTION | TOPIC OR ASPECT TESTED | AVERAGE % FROM SAMPLE |
| 3.1.1 | Communication and Network Technologies | 81% |
| 3.1.2 | | 56% |
| 3.2.1 | | 28% |
| 3.2.2 | | 41% |
| 3.3.1 | | 56% |
| 3.3.2a | | 76% |
| 3.3.2b | | 88% |
| 3.4 | | 66% |
| 3.5.1 | | 26% |
| 3.5.2 | | 61% |
| 3.6.1 | | 60% |
| 3.6.2 | | 76% |
| 3.7.1 | | 72% |
| 3.7.2 | | 89% |

- 3.1.1 Most learners could answer this question well. They also did not mention hardware which was mentioned in the question and that was indicated that the learner read the question and interpreted it well.
- 3.1.2 The learners could answer this question mostly receiving at least one mark.
- 3.2.1 The learners had a tough time with this question as most of them got confused with the protocol TCP/IP and an IP-address, which identifies a PC on a network. Few learners mentioned that a protocol is a set of rules, and in this case a set of rules for communication.
- 3.2.2 Most learners could answer this question.
- 3.3.1 This was seen as an easy question, but learners struggled with the correct computer language or terms. Learners must be careful not to give the same fact twice and only phrasing it differently.

- 3.3.2a) Most learners knew the answer.
- 3.3.2b) Most learners could answer this question.
- 3.4 This question was answered well. Learners must make sure that they give a valid solution for each problem.
- 3.5.1 Learners should make sure they write the whole phrase. They get confused with the different technologies and give general answers like dongle. Learners must include the keyword Wifi-NIC, -dongle, -adaptor.
- 3.5.2 Learners answered this question well.
- 3.6.1 Learners answered this question well.
- 3.6.3 Learners answered this question well.
- 3.7.1 Learners focused on the area where a hotspot is set up. Learners must also mention the internet aspect that it is a place to connect to the Internet wirelessly of for free. The fact that it is free makes it public.
- 3.7.2 Learners answered this question well.

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

- 3.2.1 The learners do not know the difference between the TCP/IP protocol and an IP-address.
- 3.2.2 If they got 3.2.1 wrong the majority of them got this one wrong also.
- 3.3.1 Learners must not give the same fact twice; e.g. The second fact is first fact but just rephrased.
- 3.5.1 Learners must write whole phrases e.g. Wifi-dongle or Wifi-adaptor instead of just dongle or adapter

(c) Provide suggestions for improvement in relation to Teaching and Learning

Learners tended to generalize their answers, using terms like fast, or slow. This must be avoided, a complete explanation would be encouraged.

(d) Describe any other specific observations relating to responses of learners

More time should be spent by the learners reading to understand the questions.

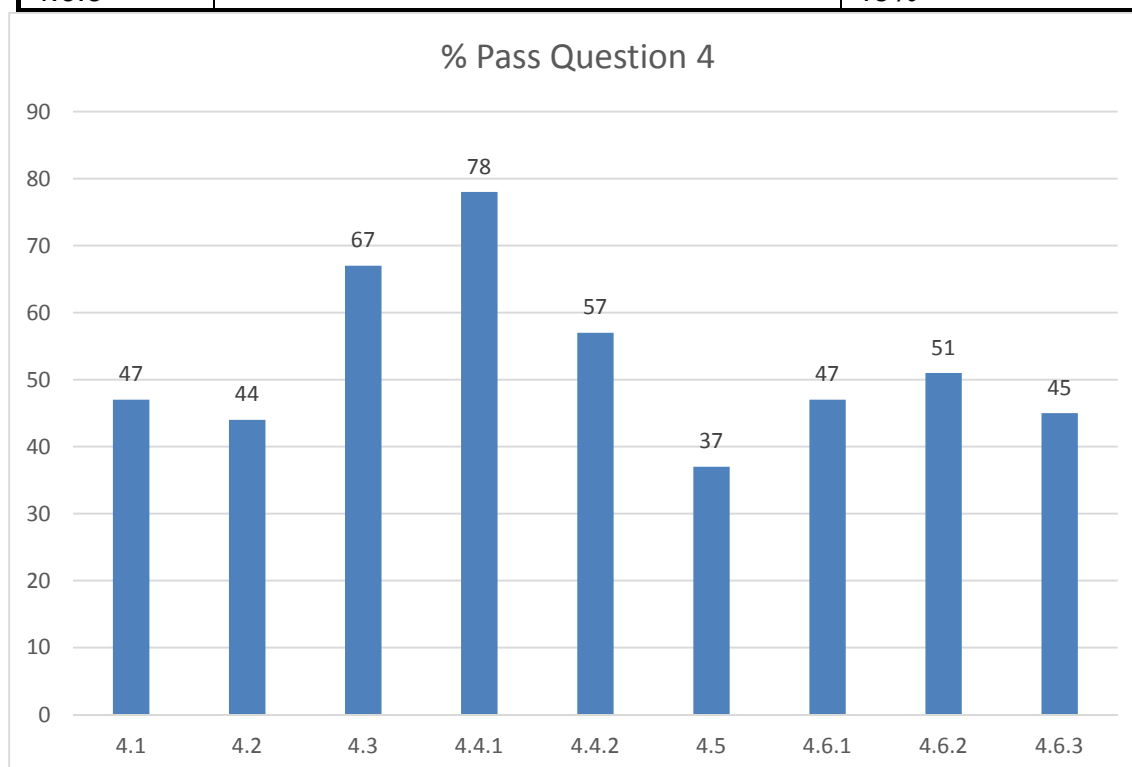
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

More time needs to be dedicated on knowing the different types of protocols and then the different types of data transmission mediums. They should learn to compare amongst the technologies available.

QUESTION 4

- (a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

| Average mark from the sample of 100 : | | 50% |
|---------------------------------------|---------------------------------|-----------------------|
| SUB-QUESTION | TOPIC OR ASPECT TESTED | AVERAGE % FROM SAMPLE |
| 4.1 | Data and Information Management | 47 |
| 4.2 | | 44 |
| 4.3 | | 67 |
| 4.4.1 | | 78 |
| 4.4.2 | | 57 |
| 4.5 | | 37 |
| 4.6.1 | | 47% |
| 4.6.2 | | 51% |
| 4.6.3 | | 45% |



Question 4 was poorly answered.

- (b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

4.1 Most learners could answer this question. Teachers must take note that putting data in the correct format is NOT seen as quality data.

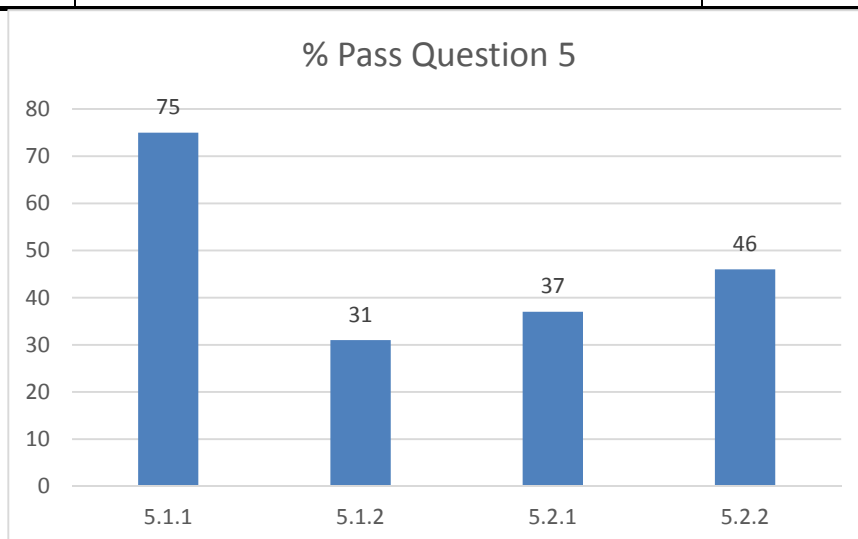
4.2 Update anomaly refers to changing a field and the change cannot reflect in the related fields – one or many tables. Learners got the first part right, but they struggled with the second part.

| |
|---|
| 4.3 This question was misinterpreted by the learners. |
| 4.4.1 and 4.4.2 These two questions |
| 4.5 Poorly answered, but some learners understood the data warehousing concept. The memo was amended to accept normalisation. |
| 4.6.1 Most learners answered this question correctly. They mentioned the primary key, but not that this meant it is a unique value. |
| 4.6.2 SQL: Most learners could do the SELECT, but did not do well in the UPDATE and DELETE questions. Teachers should make sure that learners know the basic structure of the SELECT, UPDATE and DELETE functions of SQL. |
| 4.6.3 Most learners could answer this question which shows that the learners do have a general good understanding of SQL. Some learners did not write the company name in the correct order, therefor losing a mark. |
| (c) Provide suggestions for improvement in relation to Teaching and Learning |
| Teacher and learners need to practice more on this topic. A lot of this type of questions are similar therefore it should be easy for teachers and learners to prepare. |
| (d) Describe any other specific observations relating to responses of learners |
| Learners should take note that when answering SQL and certain fields are required to be displayed, that a * will not be accepted. |
| (e) Any other comments useful to teachers, subject advisors, teacher development etc. |
| SQL needs to be allocated a lot of time. |

QUESTION 5

- (a) General comment on the performance of learners in the specific question.
Was the question well answered or poorly answered?

| Average mark from the sample of 100 : | | 46% |
|---------------------------------------|------------------------|-----------------------|
| SUB-QUESTION | TOPIC OR ASPECT TESTED | AVERAGE % FROM SAMPLE |
| 5.1 | Solution Development | 75 |
| 5.2 | | 31 |
| 5.3 | | 37 |
| 5.4 | | 46 |



This was the most poorly answered question for the whole paper

- (b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

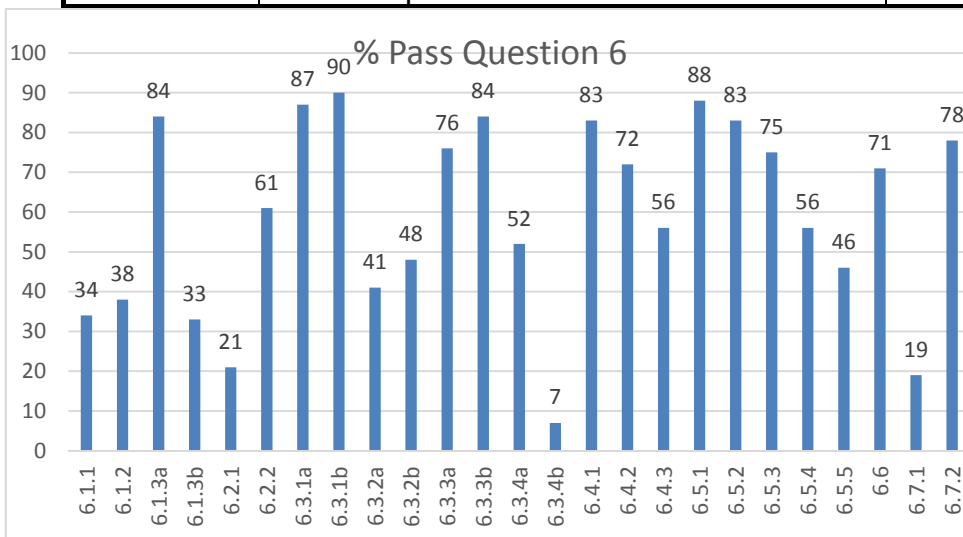
- 5.1.1a) Most learners could answer this question. They understood what good GUI design entails.
- 5.1.1b) Most learners could see that the checkboxes needed to change to a radiogroup to avoid them both being selected. The size of the table had to be a spinedit instead of a edit box.
- 5.2 Most learners could draw the UML diagram, but it should be focused on more during PAT phase 2. No return values for a procedure and make sure to indicate fields AND types
- 5.3.1 Most learners did write pseudocode. Learners must avoid hardcoding the example.
- 5.3.2 Overall, learners struggled with the trace table. Pay attention to the looping process and avoid writing all the information in one line. This results in a lot of errors and no marks allocated. More time should be spent teaching trace tables.

| |
|---|
| (c) Provide suggestions for improvement in relation to Teaching and Learning |
| UML diagrams, pseudocode and trace tables need to be focused on. |
| (d) Describe any other specific observations relating to responses of learners |
| Learners could not draw a UML diagram and must take note of how methods are represented in a UML diagram. |
| (e) Any other comments useful to teachers, subject advisors, teacher development etc. |
| The concepts of programming need to be taught theoretically. There is a direct relationship to their practical performance, Teachers should not allow learners to program without making at least a pseudo code for that section of the program. Teachers should try while teaching PAT to emphasise the importance of planning, trace tables, the different diagrams (flow charts, UML, ERD). It is advisable to at least try and do all the diagrams with one program a term to emphasise and practice this important concept in preparation for the theory paper. |

QUESTION 6

- (a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

| Average mark from the sample of 100 : | | 61% |
|--|----------------------------|-----------------------|
| SUB-QUESTION | TOPIC OR ASPECT TESTED | AVERAGE % FROM SAMPLE |
| 6.1 | Internet Technologies | 47% |
| 6.2 | Communication Technologies | 41% |
| 6.3 | Internet Technologies | 61% |
| 6.4 | Social Implications | 70% |
| 6.5 | Social Implications | 70% |
| 6.6 | Social Implications | 71% |
| 6.7 | Social Implications | 58% |



This section was overall well answered, however the most poorly answered question was found here. Questions 6.2.1, 6.3.4b and 6.7.1 presented challenges because of various reasons.

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

- 6.1.1 Dynamic and Static websites – this question was not answered well which shows that the learners do not understand the concept. BOTH are interactive.
Dynamic has to do with the fact that a user can set it according to their profile – same site different appearance for each user (Facebook)
Static – same view for all users, not only one page.
- 6.1.3b) Virtual Server – most learners only mentioned increasing resources as traffic increases, but did not mention the downscaling when traffic returns back to normal.
- 6.2.1 Most learners answered radio waves which is not correct – should be radio frequency. Teachers should teach the difference between the two.
- 6.2.2 Learners tend to not answer giving valid answers eg. RFID will not get lost or it is more convenient
- 6.3.2a) Internet of things – answered well, but learners forgot to state that the devices communicate through the Internet
- 6.3.2b) Information overload – most learners got the ‘too much information’ part of the answer, but indicated that a computer/system could not cope; should be based on a human
- 6.3.4b) Learners did not know what Javascript is
- 6.7.1 learners mentioned that a smartcard has a chip; any card can store information even on magnetic strip

(c) Provide suggestions for improvement in relation to Teaching and Learning

Learners need to be exposed to new trends and technologies because the integrated scenario-type questions may contain any of the latest developments. All theory knowledge learnt throughout the year must be used to discuss the new technologies and devices to answer the question from an IT perspective (keeping IT concepts in mind).

(d) Describe any other specific observations relating to responses of learners

6.4.2 most learners could identify intelligent tasks with ease and interpret this question; some learners got confused with a device and a technology e.g. Artificial intelligence instead of saying artificial intelligent device

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

Teachers need to try and stay informed about the latest technologies. The learners know a lot about new technologies and should be given the opportunity to share their knowledge in class.



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

INFORMATION TECHNOLOGY P2

NOVEMBER 2016

MARKS: 150

TIME: 3 hours

This question paper consists of 16 pages.



INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX sections:

| | | |
|------------|--|------|
| SECTION A: | Short Questions | (15) |
| SECTION B: | Systems Technologies | (25) |
| SECTION C: | Communication and Network Technologies | (25) |
| SECTION D: | Data and Information Management | (25) |
| SECTION E: | Solution Development | (20) |
| SECTION F: | Integrated Scenario | (40) |

2. Read ALL the questions carefully.
3. Answer ALL the questions.
4. The mark allocation generally gives an indication of the number of facts/reasons required.
5. Number the answers correctly according to the numbering system used in this question paper.
6. Write neatly and legibly.



SECTION A: SHORT QUESTIONS**QUESTION 1**

- 1.1 Various options are provided as possible answers to the following questions. Write down the question number (1.1.1–1.1.5), choose the answer and make a cross (X) over the letter (A–D) of your choice in the ANSWER BOOK.

EXAMPLE:

1.1.6

| |
|---|
| A |
|---|

| |
|---|
| B |
|---|

| |
|---|
| C |
|---|

| |
|--------------|
| D |
|--------------|

- 1.1.1 The type of system software that can be used to perform routine maintenance tasks is known as ...
- A the database management system.
B utility software.
C device drivers.
D communication software. (1)
- 1.1.2 Intellectual property rights refer to the ...
- A permission granted to an individual to refer to a document created by another author.
B rights of the author of a software application, claiming ownership of the idea behind the program.
C rights a website has over the pictures on their site.
D permission granted to an individual to copy part of a published document. (1)
- 1.1.3 Bandwidth in e-communication refers to ...
- A media where one is able to surf the net and make telephone calls at the same time.
B the total number of files that can be transferred by one user.
C the width of the cable transferring the data.
D the total amount of data that can be carried from one point to another in a given period of time. (1)
- 1.1.4 The conversion of binary number 10111 to a decimal number is ...
- A 23.
B 22.
C 30.
D 11. (1)

1.1.5 How many times will the loop below be executed?

$Q \leftarrow 1$

While $Q > 0$ do

...

$Q \leftarrow Q * 3 - 1$

End While

A Once

B Not at all

C Infinitely

D Three times

(1)

1.2 Give ONE word/term for each of the following descriptions. Write only the word/term next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.

1.2.1 The unnecessary repetition of data in a database file (1)

1.2.2 The process of maximising the number of visits to a particular website by ensuring that the site appears high on the list of results returned by a search engine (1)

1.2.3 A software update that is designed to correct a certain or specific problem/error that occurs in software that has been released or is in use (1)

1.2.4 The type of software provided at no cost by a company where the company retains all rights to the software (1)

1.2.5 A signal created and sent to the CPU that is caused by some action taken by a hardware device (1)

1.2.6 Part of an organisation's intranet that is made available to users outside the organisation (1)

1.2.7 Computing where the physical location of a person or object is determined and used (1)

1.2.8 The protocol used to transfer large files between remote computers that have an Internet connection (1)

1.2.9 A copyright licence that allows one to use parts of, copy and distribute work for non-profit purposes (1)

1.2.10 A system where parts of a database are spread across servers in separate locations (1)

TOTAL SECTION A: 15



SCENARIO

The IT class has invited interested parties and companies to exhibit business, career and study opportunities in IT and also new developments in technology at their school. The exhibition will take place in the school hall over a weekend.

SECTION B: SYSTEMS TECHNOLOGIES**QUESTION 2**

Learners from the IT class need to man the help desk at the exhibition and answer a variety of computer-related questions.

- 2.1 Users want to know whether the BIOS is still required in a computer system today. Motivate the need for the BIOS by stating TWO important tasks it performs. (2)
- 2.2 How does the use of virtual memory prevent the problem of the operating system running out of memory when executing programs? (3)
- 2.3 The performance of a computer depends on the performance of the CPU. How does EACH of the following contribute to improving the performance of the CPU:
- 2.3.1 Cache memory (3)
- 2.3.2 Hyperthreading (2)
- 2.3.3 Dedicated video/graphics cards (2)
- 2.4 Users often complain that their computers initially performed well, but were very slow after some time.
- Give TWO possible reasons for this AND explain how to solve this problem. (4)
- 2.5 Most computer users use USB flash disks which are plug-and-play compliant.
- Briefly explain what *plug-and-play compliance* means. (2)

- 2.6 The reliable storage and backup of data are important in any IT environment.
- 2.6.1 RAID technology is often used to improve the reliability of data storage. Briefly explain the concept of *mirroring* used in RAID technology. (2)
- 2.6.2 Other than RAID technology, state TWO techniques that have been introduced to improve the reliability of hard disk drives as storage devices. (2)
- 2.6.3 A network-attached storage (NAS) device could be used to backup data on-site.
- State TWO advantages of using network-attached storage devices to backup data on-site. (2)
- 2.7 Software as a Service (SaaS) is used at the school.
- Motivate the use of SaaS at a school. (1)

TOTAL SECTION B: 25



SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES**QUESTION 3**

A peer-to-peer LAN, which may be used by the exhibitors, will be provided in the school hall. The LAN in the hall will be connected to the school's client-server network.

- 3.1 One advantage of using a network is that one is able to share hardware, such as printers.
- 3.1.1 State TWO other advantages of networking computers. (2)
- 3.1.2 Explain why a client-server network is more suitable than a peer-to-peer network to host a school's administration system. (2)
- 3.2 TCP/IP is one of the standard protocols currently used in networks.
- 3.2.1 Briefly explain the purpose of TCP/IP. (2)
- 3.2.2 SMTP is one of the protocols in the TCP/IP suite. What is the purpose of the SMTP? (1)
- 3.3 The school uses copper cables as a communication medium in their LAN.
- 3.3.1 State TWO weaknesses/disadvantages of copper cables as a communication medium. (2)
- 3.3.2 Fibre-optic cables were installed in the area around the school as part of a WAN that the school will be able to use.
- (a) What medium is used to transfer data in fibre-optic cables? (1)
- (b) Motivate why fibre-optic cables would be advisable to use in a WAN. (1)
- 3.4 The school's administration data needs to be kept safe on their network.
- State TWO possible ways in which data could be tampered with on a LAN.
- Suggest a precautionary measure that could be taken in EACH case to prevent these problems. (4)
- 3.5 The exhibitors can use laptop computers to connect to the Internet, using the school's wireless connection.
- 3.5.1 What hardware will a laptop computer require to connect wirelessly to the Internet? (1)
- 3.5.2 State TWO disadvantages of wireless communication. (2)



- 3.6 Many visitors at the exhibition will use their mobile devices to access the Internet and interact with the presentations by the exhibitors.
- 3.6.1 Explain the term *convergence* relating to mobile devices. (2)
- 3.6.2 State TWO constraints users normally experience when using mobile devices. (2)
- 3.7 There are several free public Wi-Fi hotspots with limited data per day that visitors can use in the area where the school is situated.
- 3.7.1 What is a *public Wi-Fi hotspot*? (2)
- 3.7.2 Motivate the reason for limiting the data per day for the users of these Wi-Fi hotspots. (1)

TOTAL SECTION C: 25



SECTION D: DATA AND INFORMATION MANAGEMENT**QUESTION 4**

The information on the exhibition is stored in a database.

- 4.1 Quality data is needed for useful information to be extracted from a database.

List THREE characteristics of quality data. (3)

- 4.2 While testing the database one of the users complained about an update anomaly that occurred.

What is an *update anomaly*? (2)

- 4.3 The school runs their DBMS (database management system) on their server.

What is the advantage of running a DBMS on a server? (1)

- 4.4 Many learners are interested in careers in the database environment.

4.4.1 What is the responsibility of a database administrator? (1)

4.4.2 State TWO tasks specific to the job description of a database analyst. (2)

- 4.5 After extensive use of a database where the data rapidly accumulates, the database may become large and slow.

Suggest a solution to scale down the size of the database without losing the functionality of the database. (1)

- 4.6 The data for the exhibition has been recorded in a database consisting of two tables, **tblExhibitors** and **tblStands**, in a one-to-many relationship. The structure of the tables and its content are shown below.

| tblExhibitors | | | |
|----------------------|----------------------|------------------|---------------------------|
| | Name of field | Data type | Description |
| | ExhibitorNo | Autonumber | Unique exhibitor's number |
| | CompanyName | Text | Name of company |
| | ContactNo | Text | Contact number of company |

Data of four records in the **tblExhibitors** table:

| ExhibitorNo | CompanyName | ContactNo |
|--------------------|--------------------|------------------|
| 1 | Funda | 0246523652 |
| 2 | MoreDevices | 0117857411 |
| 3 | NewWiz | 0121234565 |
| 4 | BooksForAll | 0164525263 |

| tblStands | | | |
|-----------|---------------|-----------|-------------------------------|
| | Name of field | Data type | Description |
| → | StandNo | Text | Unique stand number |
| | ExhibitorNo | Number | Exhibitor number |
| | PlugPoint | Yes/No | Plug point required or not |
| | Assistants | Number | Number of assistants required |

The **tblStands** table below shows all the stands allocated to the exhibitors at the exhibition.

| StandNo | ExhibitorNo | PlugPoint | Assistants |
|---------|-------------|-----------|------------|
| A01 | 4 | ✓ | 2 |
| A03 | 2 | ✓ | 0 |
| A04 | 2 | ✓ | 1 |
| B01 | 3 | ✓ | 1 |
| B02 | 3 | | 0 |
| C01 | 1 | | 2 |
| C02 | 2 | ✓ | 2 |
| C03 | 4 | ✓ | 4 |

- 4.6.1 The organiser is concerned that the same stand might be allocated to more than one exhibitor.

Explain why the current design of the database will not allow for the same stand to be allocated to more than one exhibitor. (2)

- 4.6.2 Use the **tblExhibitors** and **tblStands** tables above and write SQL statements to perform the following tasks:

(a) Display the stand numbers that require a plug point. (3)

(b) Allocate an additional assistant to each stand. (3)

(c) The NewWiz company has incorrectly reserved an extra stand for the exhibition. Remove the stand with stand number B02 from the database. (2)

- 4.6.3 The following SQL statement was entered:

```
SELECT CompanyName, Count(StandNo) AS NumStands,
Sum(Assistants) AS SumAssistants
FROM tblExhibitors, tblStands WHERE
tblExhibitors.ExhibitorNo = tblStands.ExhibitorNo
GROUP BY CompanyName;
```

Use the example data provided for the **tblExhibitors** and **tblStands** tables and give the exact output for the SQL statement above. (5)

TOTAL SECTION D: 25



SECTION E: SOLUTION DEVELOPMENT**QUESTION 5**

5.1 Exhibitors must register with the committee to ensure that no double bookings occur.

5.1.1 The electronic form below was designed to be used for online registration.

Enter your name

Enter your main product for display

☐ Male ☐ Female

What size table do you require?

Enter your e-mail address

Enter the name of your company

Enter your contact number

Additional requirements

- (a) Critically comment on the layout of the components of the form, by indicating TWO ways in which the layout can be improved. (2)
- (b) Critically evaluate the components on the form that are used to obtain data from the user. Identify TWO poorly chosen components and suggest a more suitable component in EACH case. Motivate EACH suggestion. (2)

- 5.1.2 The form below was designed to capture the data of a stand object named **objStand**.

Using the above form, draw a UML (unified modelling language) diagram for the **objStand** object class.

The diagram must contain the following:

- All the attributes for this object according to the specifications of a UML diagram
- An accessor method for the 'Stall code' attribute
- A mutator method for the 'Plug point required' attribute

(4)

- 5.2 A number of competitions will be run during the course of the exhibition. The IT learners are requested to assist in developing apps for these competitions.

- 5.2.1 The answer to a mathematical sequence is required. The program must randomly generate a number in the range from 1 to 10 (inclusive) and use this value to generate the terms of the sequence and the required answer.

Example:

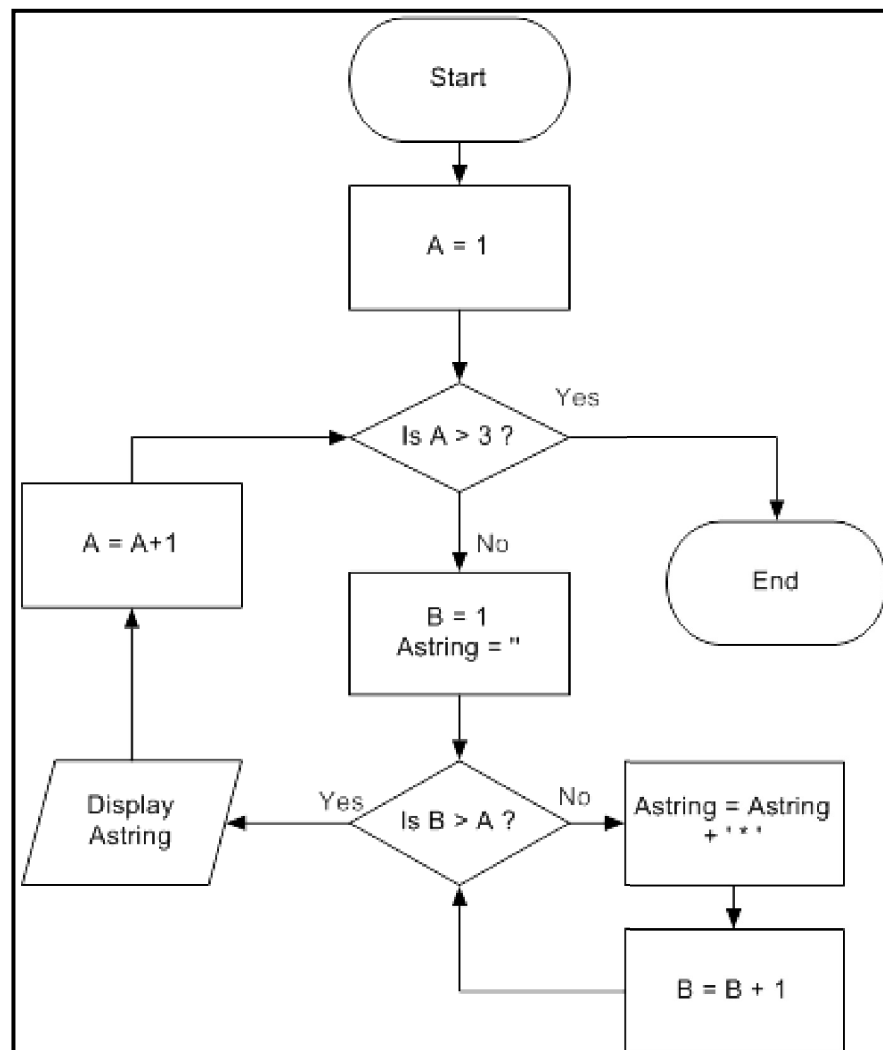
If the random number generated is 6, the answer must be calculated as follows:

$$\text{Answer} = \frac{1}{6} - \frac{2}{5} + \frac{3}{4} - \frac{4}{3} + \frac{5}{2} - \frac{6}{1}$$

Write pseudocode to generate the random number and calculate the answer for the sequence generated. Do NOT display the sequence of terms.

(7)

- 5.2.2 One of the competitions will require that the learners determine the output for a program segment represented by the flowchart below.



Copy and complete the trace table below to determine what the output of this program segment will be.

| A | Is A>3? | B | Astring | Is B>A? | Display |
|---|---------|---|---------|---------|---------|
| | | | | | |

(5)

TOTAL SECTION E: 20

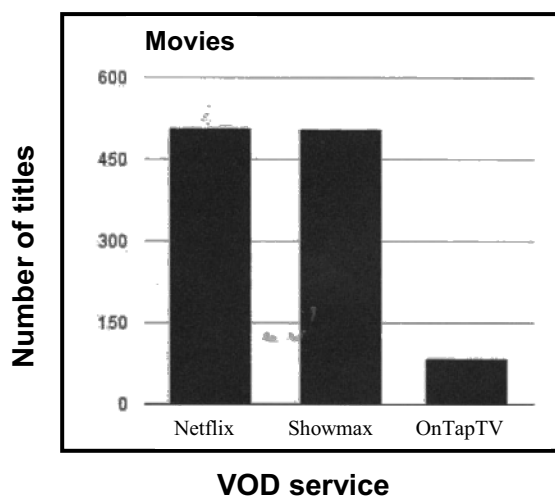
SECTION F: INTEGRATED SCENARIO**QUESTION 6**

The exhibition will showcase a variety of topics and new technologies. A separate help desk will be available to assist with Internet-related aspects.

- 6.1 The school hosts a dynamic website and will use this website to promote the exhibition.
- 6.1.1 Explain the difference between a *dynamic website* and a *static website*. (2)
- 6.1.2 Important information regarding the exhibition will appear on the school website and an RSS facility will be provided.
- What is an *RSS facility*? (2)
- 6.1.3 It has been suggested that a blog should be used to promote the exhibition.
- (a) Give an example of how a blog can be used for this purpose. (2)
- (b) Discuss scalability with reference to the virtual server hosting a blog and the traffic reacting to a blog post. (2)
- 6.2 Each exhibitor will be issued with a wrist band containing an RFID tag to allow the exhibitor access to the canteen for lunch.
- 6.2.1 What technology is used by RFID tags? (1)
- 6.2.2 Motivate the use of RFID tags instead of tickets with bar codes. (1)
- 6.3 A number of Internet-related questions were submitted to the IT learners at the help desk.
- 6.3.1 The Internet provides various online storage facilities.
- (a) Briefly discuss TWO advantages of using cloud storage. (2)
- (b) Motivate why the following TWO issues would be important when choosing a specific online storage facility:
- Speed
 - Security (2)
- 6.3.2 The Internet of Things is one solution for information overloading.
- (a) Briefly explain what the *Internet of Things* is. (2)
- (b) What is meant by *information overloading*? (2)



- 6.3.3 The graph below shows some VOD services that are available on the Internet.



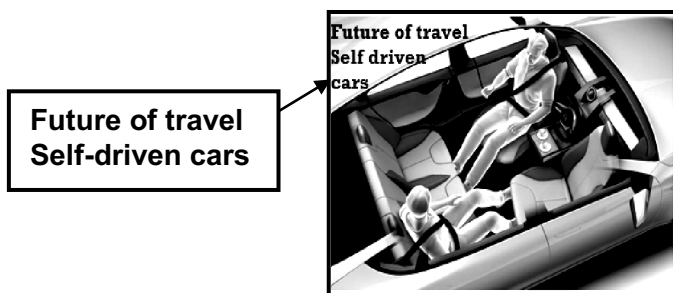
- (a) What is a *VOD service*? (1)
- (b) Netflix is a streaming service.

Differentiate between *using a streaming service* and *downloading movies*. (2)

- 6.3.4 HTML (hypertext mark-up language) and JavaScript, which is a scripting language, are often mentioned in terms of web page design.

- (a) Why does one need HTML to display web pages? (1)
- (b) Why is JavaScript regarded as a scripting language? (1)

- 6.4 One of the exhibitors will do a presentation on the capabilities of intelligent self-driven vehicles.



- 6.4.1 State ONE essential intelligent task that the software designed for a self-driven vehicle should be able to perform. (1)
- 6.4.2 Self-driven vehicles use GPS devices.

Name TWO other hardware devices that this type of vehicle should have in order to perform the intelligent tasks required. (2)

6.4.3 It has been stated that there will be fewer accidents with self-driven vehicles as human error will be eliminated.

State ONE disadvantage of self-driven vehicles. (1)

6.5 A cybercrime expert will compile a poster about computer crimes committed by means of ICT as a tool.

6.5.1 Give ONE example of cybercrime that affects society negatively. (1)

6.5.2 Discuss ONE way in which cybercrime can have a negative influence on a business. (2)

6.5.3 Explain how phishing is used in online fraud scams. (2)

6.5.4 How would an audit trail assist when the hacking of a database is investigated? (2)

6.5.5 Explain what a *denial-of-service attack* is. (2)

6.6 An environmental agency requested a stand to promote the responsible use of computers in the environment.

Suggest TWO ways in which the negative effects of computers on the environment can be minimised. (2)

6.7 The Department of Home Affairs will attend the exhibition to encourage people to apply for their new smart ID cards.

6.7.1 Briefly explain what a *smart card* is. (1)

6.7.2 Explain the advantage for citizens to have smart ID cards. (1)

TOTAL SECTION F: 40
GRAND TOTAL: 150



