



GREENBURY SECONDARY SCHOOL

INFORMATION TECHNOLOGY P2
NOVEMBER EXAMINATION 2018

GRADE 11

MARKS: 150

TIME: 3 hours

This question paper consists of 12 pages including the cover page and 6 questions.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX sections:

SECTION A: Multiple-choice questions (10)

SECTION B: System Technology (20)

SECTION C: Communications Technologies and Network
Technologies (30)

SECTION D: Data and Information Management (25)

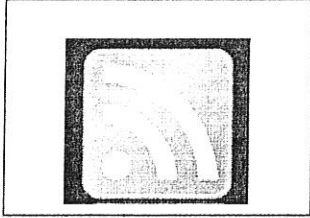
SECTION E: Solution Development (25)

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.

Write down the letter only of the option(A-D) that best matches the question above it for 1.1. to 1.10.

- 1.1. Convergence refers to...
- A technology that is always on.
 - B technology that does not need to be tethered to wired connections.
 - C functionalities of many devices built in one
 - D the ability of mobile devices to connect to one another.
- 1.2. The ... translates an entire program into machine language before execution.
- A compiler
 - B interpreter
 - C translator
 - D operating system
- 1.3. This technology automates the configuration process of a device before it can be used.
- A Caching
 - B Hot Swappable
 - C Daisy Chaining
 - D Plug and Play
- 1.4. Which of the following refers to an encryption technology used to authenticate the identity of the sender of an e-mail message?
- A Digital certificate
 - B Digital divide
 - C Digital signature
 - D Digital handshake
- 1.5. Which of the following is **NOT** associated with green computing?
- A Using Energy Star compliant hardware
 - B The 'Paperless office'
 - C Using refillable toner cartridges
 - D Replacing computer equipment on a four-yearly basis
- 1.6. Compressing data by losing some insignificant portions of data.
- A Lossy Compression
 - B Archiving
 - C Backup
 - D Filtering

- 1.7. A collection of programs that are designed to infiltrate a computer and gain the highest level of privileges to take control of the infected computer.
- A Rootkit B Trojan
C Admin Bug D Malware
- 1.8. With what is this icon shown here associated?
- A WiFi router
B Hot Spot
C RSS
D Low WiFi Signal
- 
- 1.9. An organisation's private network environment consisting of documents and resources relating to the organisation's business is known as their....
- A ethernet
B extranet
C intranet
D internet
- 1.10. Which ONE of the following terms does NOT belong to the others?
- A Android
B iOS
C Windows RT
D Linux

TOTAL SECTION A = [10]

SCENARIO:

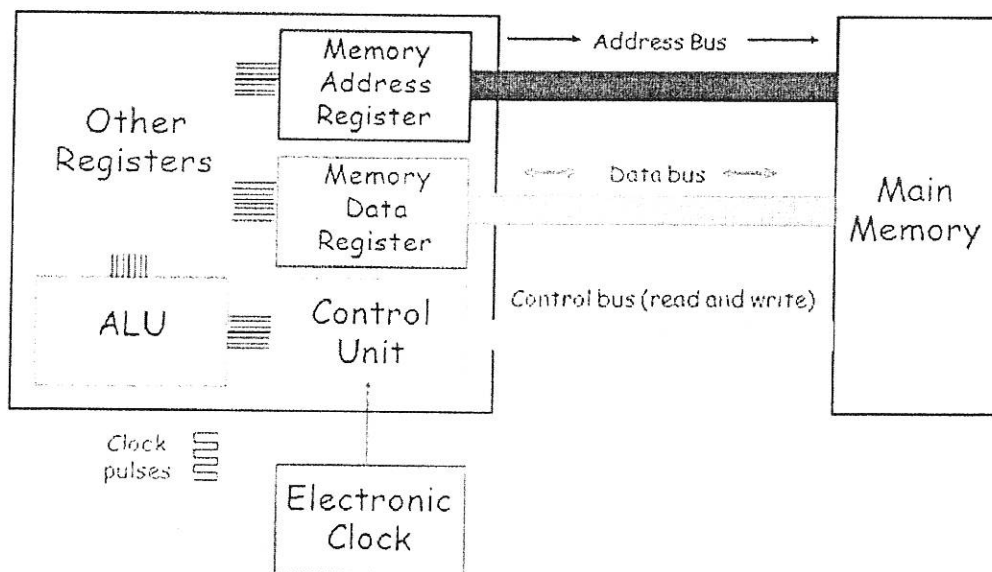
The municipality has nominated your school as the centre to hold training classes to upgrade the skill levels of the community members in ICT. This initiative is aimed at helping individuals market themselves and promote employment. The initiative is aimed at school learners first and may later extend to the public at large.

The municipality has provided your school with some computers to assist.

The I.T. Educator and I.T. learners will assist in the learning programs.

SECTION B: SYSTEM TECHNOLOGIES**QUESTION TWO**

- 2.1. One of the computers was opened and examined by the IT class. The motherboard was found to have many different components and connectors found all over it.
- 2.1.1. This motherboard was found to have serial ATA connectors. What device is this connector an interface for? (1)
- 2.1.2. List **TWO** outdated connectors that SATA has replaced. (2)
- 2.1.3. The CPU is connected via the **ZIF** socket. What does **ZIF** stand for. (1)
- 2.2. Primary memory or internal memory and buses are essential to the tasks of the Central processing unit. Study the diagram below and answer the questions based on it:



<http://1.bp.blogspot.com/-cDG4odDTdJs/Tm8diTOKUil/AAAAAAAAAuM/tOnEQf84vfs/s1600/The%2BProcessor%2BDiagram.bmp>

- 2.2.1. What is the combined name for the three busses shown in the diagram? (1)
- 2.2.2. The main function of the CPU is to carry out the machine cycle. List the four steps of the machine cycle. (4)
- 2.2.3. What is the main purpose of the registers in the CPU? (1)
- 2.2.4. Even though RAM is very fast and found close to the CPU, it is still possible to have delays during processing between the CPU and RAM.
- i) Do you agree with the statement above? Motivate your answer by referring to how this delay could be made possible. (2)
- ii) What is the name given to the type of delay discussed above? (1)

- 2.3. The CPU is said to be a faster component connected to the Northbridge while the slower components are traditionally connected to the Southbridge of the computer.
- 2.3.1. What integral classification of the motherboard does the Northbridge and Southbridge form part of? (1)
- 2.3.2. List any **Two** components connected to the Southbridge. (2)
- 2.4. Besides Computers, ROM can be found in a number of different electronic devices e.g. household appliances such as washing machines, microwaves, toys or desk calculators. ROM is distributed containing *firmware* rather than software.
- 2.4.1. What is the purpose of a Read Only Memory chip? (1)
- 2.4.2. Define the term *firmware*. (2)
- 2.4.3. State **two** reasons why it is necessary to update your firmware. (1)

TOTAL SECTION B = [20]

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION THREE

In order for the school to be up-to-date with regards to current events, news and relevant information, it needs to be established as one of the centres on the municipality network. It is also imperative that the school has its own network

- 3.1. State three advantages of a network to the organization. (3)
- 3.2. ADSL is used for connecting to the internet. State TWO advantages of using a fixed line connection such as ADSL over a mobile connection. (2)
- 3.3. **Star topology will be used in this network.**
- 3.3.1. What do you understand by the words *topology of a network*? (1)
- 3.3.2. Draw a diagram to illustrate a star topology using appropriate labels. (2)
- 3.4. Apart from communication, what is the function of a NIC (Network Interface Controller)? (2)
- 3.5. What is the difference between a **router** and a **switch**? (2)

3.6. **Cabling is part of a network. UTP and fibre optic cables are the two main types of cables.**

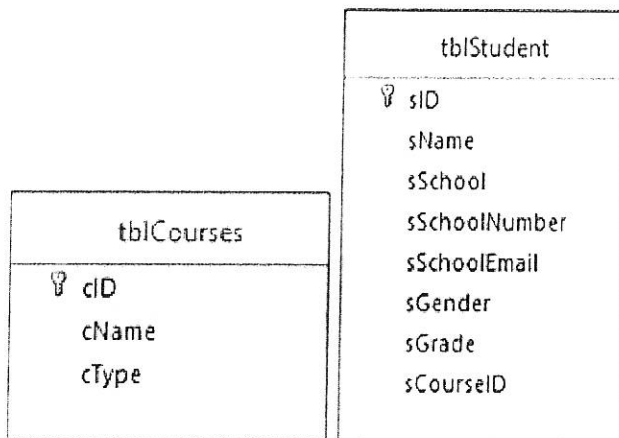
- 3.6.1. Differentiate between these two cables by describing how data is transferred over the cables. (2)
- 3.6.2. Briefly discuss the problem of attenuation, EMI and eavesdropping when using UTP cables. (3)
- 3.6.3. Which cable is mostly used in this type of network? (1)
- 3.7. **Protocols are necessary to enable transmission across a network or the Internet.**
- 3.7.1. What is a network protocol? (1)
- 3.7.2. Differentiate between http and https. (2)
- 3.7.3. Name the communications protocol used to transfer large files between computers via networks such as the Internet. (1)
- 3.7.4. Explain what the following protocols are: VOIP, HTTP and SMTP. (3)
- 3.7.5. Secure Sockets Layer is a type of protocol that provide security during communication and transactions on the Internet. What procedure does SSL follow in order that security is maintained? (3)
- 3.8. State two reasons why you think servers are generally more expensive than an ordinary workstation. (2)

TOTAL SECTION C = [30]

SECTION D: DATA AND INFORMATION MANAGEMENT
QUESTION FOUR

- 4.1. A database can be described as a collection of data or facts regarding a specific topic. It is seen as a collection of related files (Tables) that contain data or related fields called records.
- 4.1.1. List TWO advantages of using database software. (2)
- 4.1.2. Explain what a Database Management System is? (2)
- 4.1.3. Differentiate between a Distributed and a Centralised database system. (2)
- 4.1.4. There are two main categories of DBMS's viz. Desktop and Server databases. Explain each category. (2)

- 4.2. The database tables created below are used to capture the details of learners who registered for the training courses offered at your school.



- 4.2.1 State the primary key for each table shown above. (2)
- 4.2.2 What is the name of the tables shown above? (2)
- 4.2.3 Define the term foreign key. (2)
- 4.2.4 Identify the foreign key in the above diagram. State the table that contains the foreign key. (2)
- 4.2.5 With the aid of a diagram (as shown above), illustrate the relationship that can be created. Indicate on the diagram the type of relationship that is established. (3)
- 4.4. **When data is stored in a database, we must ensure that it is useful and relevant to us. The quality of data is imperative hence criteria is necessary to maintain this quality.**
- Some of these criteria may include **Accuracy, Correctness, Currency, Relevance and Completeness.**
- Discuss what is meant by **Currency** in the above list of criteria by giving an example. (2)
- 4.5. In order to access and manipulate data in a meaningful way, the user interface of a database must at least include **CRUD**. What does each letter refer to when accessing and manipulating data? (4)

TOTAL SECTION D = [25]

SECTION E: SOLUTION DEVELOPMENT

QUESTION FIVE

- 5.1. Study the Delphi Code below and answer the questions based on it. The Code is supposed to generate the X^n for any two-digit integer input where X represents the larger digit and n represents the smaller digit.

```

{1} Procedure SuperPower();
{2} Var iNum , i1 , i2 : Integer;
{3}   k , prod: String;
{4} begin
{5}   prod := 0;
{6}   iNum := StrToInt(edtNum.Text);
{7}   i1 := iNum div 10;
{8}   i2 := iNum Mod 10;
{9}   if i1 > i2 then
{10}  begin
{11}    i1 := i1+i2;
{12}    i2 := i1 - i2;
{13}    i1 := i1 - i2;
{14}  end;
{15}  for k := 1 to i1 do
{16}  begin
{17}    prod := prod * i2;
{18}  end;
{19}  showMessage('The value is '+IntToStr(prod));
{20} end;

```

- 5.1.1. There is one error in the code which will cause the code not to execute. Identify the line number and indicate the type of error then rewrite the correct statement. (3)
- 5.1.2. When this code is executed, and a correct value is given for input, the output is 0. What type of error is this classified as: logical or runtime? Explain. (2)
5. 3. Correct the error to 5.1.2. so that the correct output is displayed. (2)
- 5.1.4. Explain the purpose of lines 10 to 14. (2)
- 5.1.5. Rewrite the code that will be used to replace the for...loop with a conditional while loop. Use the loop variable provided in the code. (3)
- 5.1.6. The code begins with the word **Procedure**. What is a procedure in Delphi? Write the calling statement for the procedure above. (2)

- 5.2. The results of an unknown number of students who enrolled for a Network Engineering course was given in an already sorted array (**arrMarks**). The median mark is required for the processing of other stats by admin. Write an algorithm in pseudocode form to show how you would use the existing array to determine median mark of the results.

Note that the median of an odd set of data values is calculated differently from that of an even set of data values. While in an odd set, the median is simply the middle value in the list, the median of an even set is the average of the two middle values.

(11)

TOTAL : SECTION E = [25]

SECTION F: INTEGRATED SCENARIO

QUESTION 6

The Internet is a worldwide computer network, consisting of devices, computers and networks connected to one another. More and more mobile devices such as smart phones and tablets have emerged and the number of users has also increased dramatically. With the improved access to the internet it was suggested that a website be created so that e-learning can take place.

6.1	Creating a website will be beneficial.	
6.1.1	List TWO reasons why it is important for the school to have a website.	(2)
6.1.2	After agreeing on the website it was widely circulated on social media that the school was looking to hire someone with 'HTML experience'. Explain what HTML is and what type of work will be required of this person.	(2)
6.1.3	Web 1.0 is characterised by static web pages. What do we mean by the term 'static' in this context?	(1)
6.1.4	The biggest difference between Web 1.0 and Web 2.0 is interactivity. Describe what this means in terms of how users interact with a website.	(2)
6.1.5	Web 2.0 enables users to become content creators and not just content consumers. Give TWO examples of the types of websites (not the actual names) that a user can create or use to upload content.	(2)
6.2	The use of e-learning by educators is becoming more common. E-learning is learning that is conducted via electronic media, typically the internet.	
6.2.1	State THREE ways in which e-learning may be beneficial to the learners.	(3)
6.2.2	Learners can access video lessons by either <i>downloading</i> or <i>streaming</i>.	
6.2.2.1	Differentiate between <i>downloading</i> and <i>streaming</i> .	(2)
6.2.2.2	Give a potential advantage of each of the methods <i>downloading</i> and <i>streaming</i> .	(2)
6.2.2.3	Give a potential disadvantage of each of the methods <i>downloading</i> and <i>streaming</i> .	(2)
6.2.3	Most of the learners who utilise e-learning make use of smartphones and tablets.	
6.2.3.1	These types of devices use SSD for storage. Tabulate THREE comparable differences between a SSD and a HDD.	(3)

6.2.3.2	One of the main concerns when using smartphones and tablets is battery life.	
6.3.1	List THREE things you can do to lengthen the battery life.	(3)
6.3.2	Explain why it is necessary to compress multimedia files, especially video.	(2)
6.3.3	Compression can be either lossless or lossy Briefly explain the difference between these compression techniques.	(2)
6.4	What is the relationship between the quality of a multimedia file, its size and the time it takes to download the file via the Internet?	(2)
6.4.1	A high volume of people will be using the computers at the learning centre. It is thus important for the centre to safeguard their data from threats such as <i>malware</i> . Provide a short description of the following: <ul style="list-style-type: none"> - A virus. - Spyware 	(2) (2)
6.5	One of the computers in the learning centre has a single core CPU. State if the following processing techniques will be able to take place. Motivate your answers.	
6.5.1	Multi-tasking	(2)
6.5.2	Multi-processing	(2)
6.6	Virtualisation is a common term in computers. This ranges from virtual memory to virtual reality. They are created as virtual 'objects' using software. Explain the difference between a host and a guest operating system in the context of virtualisation.	(2)
TOTAL SECTION F = [40]		
FINAL TOTAL = [150]		