



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

INFORMATION TECHNOLOGY P2

GRADE 11

JUNE 2017 EXAMINATIONS

MARKS: 100

TIME: 2½ hours

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This question paper consists of 8 pages.

SECTION A

QUESTION 1: MATCHING ITEMS

Choose a term/concept from COLUMN B that matches a description in COLUMN A. Write only the letter (A–G) next to the question number (1.1–1.5) in the ANSWER BOOK, for example 1.11 G.

COLUMN A		COLUMN B	
1.1	A type of port that can transfer data faster than a USB	A	Thunderbolt
1.2	A start up test performed by the BIOS	B	router
1.3	Combining multiple technologies into a single multi-purpose device	C	convergence
1.4	A superfast connection technology – supports simultaneous connections	D	OCR
1.5	A device used to connect to internet	E	POST
		F	ZIF socket
		G	Firewire

(5 x 1)

[5]

QUESTION 2: MULTIPLE-CHOICE QUESTION

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (2.1–2.5) in the ANSWER BOOK, for example 2.1 B.

- 2.1 A semicolon at the end of a for.. do loop in DELPHI programming is a
- A Syntax error
 - B Runtime error
 - C Error checking method
 - D Logical error
- 2.2 An end-user licence agreement ...
- A Gives the user the exclusive right to copy and sell the software to other potential users.
 - B Is a form of advertising between a software developer and a user.
 - C Grants the user ownership of the software.
 - D Is a legal contract between a software developer and the user in terms of distribution, resale and restricted use.
- 2.3 Which of the following is an input device?
- A Screen
 - B Data projector
 - C Touch screen
 - D Plotter
- 2.4 In conjunction with which ONE of the following devices would you use the abbreviation ppm?
- A Scanner
 - B Digital camera
 - C Printer
 - D Smartphone
- 2.5 The most appropriate component to capture the gender of a person is
- A Check box
 - B Spin edit
 - C Radio group
 - D Combo box

MODIFIED TRUE/FALSE

State if the following are TRUE or FALSE.

- 3.1 VoIP is the protocol used to allow calls to be made over the internet.
- 3.2 WhatsApp is an example of an IM.
- 3.3 Laptops, notebooks and netbooks are examples of mobile devices.
- 3.4 A monitor affects the performance of a computer
- 3.5 UPS is software that helps you protect your computer in the event of power failure

(5 x 1) [5]

TOTAL SECTION A: 15

SECTION B: SYSTEM TECHNOLOGIES

Your local policing forum has just purchased computers to assist them in combatting crime in your neighbourhood. They have enlisted your help to answer questions with regards to the technology.

- 4.1 Give the main three functions of the motherboard. 3
- 4.2 The machine cycle basically carries out an instruction. Explain the four steps that is executed in the machine cycle to the members of the forum. 4
- 4.3 Differentiate between the terms 'hot swappable' and 'plug and play' 2
- 4.4 Give TWO advantages of SSDs (solid-state drives) over traditional hard drives. 2
- 4.5 Name a hardware device that is needed to connect a computer to the Internet. 1
- 4.6 State TWO potential disadvantages of using voice recognition software 2
- 4.7 State TWO possible software-related issues, excluding malware, that could cause a sudden decrease in the performance of a computer. 2
- 4.8 Name TWO advantages of having a webcam installed for this particular scenario. 2
- 4.9 State TWO basic functions of an operating system, excluding tasks performed by utilities such as the disk defragmenter. 2

TOTAL SECTION A: 20

SECTION C

QUESTION 5 NETWORKS AND COMMUNICATIONS

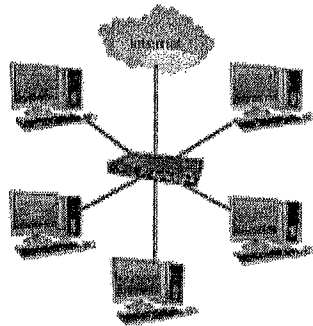
A network is a collection of computing devices connected by some sort of communication media.

5.1 List 3 reasons for having a network. [3]

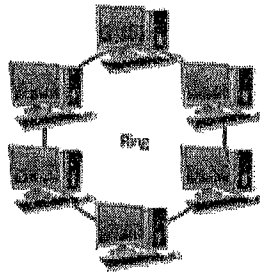
5.2 A Network Interface Controller is necessary to allow a device to communicate with the network. What is the main function of the NIC? [2]

5.3 Most modern devices have at least 2 different NIC's – a smartphone would typically have a WiFi NIC and a 3G/4G cellular modem. What do Laptops typically have? [2]

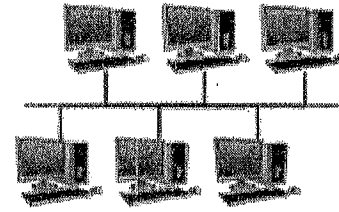
Some common network layouts are shown below. Answer the questions that follow.



Star Network Topology



Ring Network Topology



Common Bus Topology

5.4 Give the main advantage of the star topology over the other two examples. [1]

5.5 The central device of a star topology is usually a switch but the picture above suggests the use of a multipurpose central device that combines the functions of a switch, router, modem and WiFi access point. Define two of these terms. [4]

5.6 Different communication media [WiFi, UTP and Fibre] have different physical limitations that influence their suitability in networks. Consider a school environment and discuss which media is better suited to following areas referring specifically to their range and/or accessibility. [3]

- Computer Labs with desktops
- Between buildings
- Public spaces and general classrooms

5.7 Networks are described in terms of their size. Give the correct term for each of the following descriptions. [3]

- A network that connects computers in a school or office environment.
- A network spread over a wide geographical area such as cities, countries.
- A network organised around an individual.

5.8 Networks have provided some important innovations such as VoIP, VPN and GPS. Explain one of these technologies and give an advantage of using it. [2]

5.9 The Internet, the biggest network, has driven the development of mobile technologies to enable users to be always connected and always on. Explain what 'always on' means in terms of a mobile device? [2]



Some typical apps found on most smartphones are WhatsApp, Gmail, Twitter, Facebook, Skype and Google Maps.

- 5.10 Why are apps better than web pages on a mobile device? [2]
- 5.11 Which of these applications would use VoIP technology? [1]
- 5.12 Twitter would be best described as a _____ service as its maximum message length is small. [1]
- 5.13 POP3 and SMTP protocols would be associated with which of these applications? [1]
- 5.14 Instant messaging such as WhatsApp is a data based alternative to SMS. Give 3 other types of media can be sent other than text based messages which makes this platform so popular? [1]
- 5.15 All these apps can seriously affect the battery life of a mobile device. Suggest 2 ways to improve the battery life? [2]

TOTAL SECTION D: 30

SECTION D

QUESTION 6: SOLUTION DEVELOPMENT

Consider the algorithm below and answer the questions that follow.

1. Grade \leftarrow 8
2. Total \leftarrow 0
3. While Grade \leq 12
4. Begin
5. Ask 'How many learners in grade' + Grade
6. Add learners to Total
7. Increment Grade
8. End (while)
9. Show 'Total learners in the school' + Total

6.1 Identify 2 variables and give the correct type for these variables. [2]

6.2 State whether the loop used is Conditional or Unconditional – justify your answer by explaining the difference between the 2 types of loops. [3]

6.3 All conditional loops must follow the ITC principle (Initialise, Test, Change). Identify the line numbers in the algorithm that correspond to each of these steps. [3]

6.4 Copy the following layout into your answer books and complete the trace table showing how the content of the variables changes while tracing the steps of the given algorithm. Use the following values: 150, 165, 160, 155, 170 [7]

Step	Grade	Total	While Grade \leq 12	Output
------	-------	-------	-----------------------	--------

6.5 Loops can be controlled in 3 different ways – Counter, Sentinel and Result controlled. This algorithm shows a Counter controlled While loop. Rewrite this as a Sentinel controlled While loop. Only write the lines that need to be changed. [2]

Consider the following GUI and answer the questions that follow.

Enter ID number *

Enter Gender M/F *

6.6 Identify the input component used on this screen. [1]

6.7 What does the asterix [*] next to the two inputs signify? [1]

6.8 It is programmers responsibility to write the program in such a way that user entry errors are minimised as much as possible. Suggest a more suitable component for Gender entry. [1]

Gender can be validated by checking the 7th number in the ID number. If it is 5 or above the gender should be M(ale). If it is below 5 the gender should be F(emale). Examine the given code and answer the questions that follow.

```
1. procedure TForm1.btnValidateClick(Sender: TObject);
2. var
3. sID, SGender: String;
4. begin
5. sID := edtID.Text;
6. SGender := edtGender.Text;
7. if (strToInt(sID[7]) < 5) and (SGender = 'F') then
8. ShowMessage('Gender and ID are valid')
9. else if (strToInt(sID[7]) > 5) and (SGender = 'M') then
10. ShowMessage('Gender and ID are valid')
11. else
12. ShowMessage('Gender and ID are NOT valid');
13. end;
```

The program runs but when tested produce the following results.
ID number 7412030261085 and Gender F gives a valid result - Correct
ID number 8301196054089 and Gender M gives a valid result - Correct
ID number 0101295058089 and Gender M gives a NOT valid result - Incorrect

- 6.9 Errors in programming can be classified as Syntax, Logical or Runtime errors. What type of error is this? [1]
- 6.10 Identify and correct the problem line of code. [1]
- 6.11 If the user enters letters in the ID number field what will happen? In your answer identify the type of error and the line at which this error would occur. [2]
- 6.12 Methods and techniques used to reduce the number of errors during input can be regarded as Verification or Validation of data? [1]
- 6.13 Write an algorithm for the following : The ages of N persons are read via the input medium. Determine and print the number of persons who fall within each of the following age groups: [10]
- 18 - 25
 - 26 - 65
 - Over 65

TOTAL SECTION D: 35

GRAND TOTAL : 100

JUNE 2017 EXAMINATIONS Marking Memo 100marks

1.1	G✓
1.2	E✓
1.3	C✓
1.4	A✓
1.5	B✓
2.1	D✓
2.2	D✓
2.3	C✓
2.4	C✓
2.5	C✓
3.1	T✓
3.2	T✓
3.3	F PORTABLE COMPUTERS✓
3.4	F RAM✓
3.5	F HARDWARE✓

4.1 motherboard — provides connectors to other circuits✓
ensures communication to all components in CPU✓
distributes power to all parts that are connected o motherboard✓

4.2 machine cycle

- Fetches instructions and data from RAM✓
- Decodes instructions✓
- Executes instructions✓
- Transfers data back to RAM✓

4.3 Hot swappable refers to the ability to plug in or remove a device when the power is on ✓ and the computer is working whilst plug and play is a term coined that automates the configuration process of a device before it can be used. ✓

4.4 SSD operates at a faster speed than your traditional HD. SSD is more sophisticated in the way data is stored and managed over the HD. ✓✓

4.5 ROUTER✓

4.6 Disadvantage of VRS — One may lose ones voice due to illness — unable to access computer, VRS may not be able to pick up familiar tone due to variation in pitch coids, illness (any reasonable answer) ✓✓

4.7 software bugs, GIGO✓✓

4.8 Webcam will ensure that video footage will be provided for easier identification of criminal activity. ✓ Video calling other policing forums and teleconferencing is easier and possible with webcam✓

4.9 operating system — controls all activities of computer. Able to run multiple programs with speed and efficiency ✓✓

5.1 Any 3 of ✓✓✓

- Fast, efficient communication
- Sharing of hardware resources
- Centralisation of data
- Transfer of files
- Leisure
- Increased control and security
- Flexible access

5.2 To get and encode data from the computer to be sent over a specific medium✓ and to receive and decode data from the medium so it can be understood by the computer✓

5.3 A WiFi NIC ✓ and an Ethernet Port✓.

5.4 If a cable or device[other than the central device] breaks only the one device is affected not the entire network ✓

5.5 Any 2 terms correctly defined for 2 marks each

Switch — hardware device used to connect computers in a central location to a network so communication can occur. ✓ Directs traffic between connected devices ✓

Router — makes communication between networks possible over the internet✓ by directing data to correct destination ✓

Modem — Converts data or signal to a format that be transmitted over a communication channel✓✓

WiFi access point — send and receives radio signals ✓ and allows devices to connect wirelessly✓

5.6

a) Computer Labs with desktops — UTP as the access is a fixed point and the range is less than 100m✓

b) Between buildings — fibre optic as the range is in kms and better suited to distances ✓

c) Public spaces and general classrooms — wifi as access is anywhere in range and allows multiple users within 100m of access point. ✓

5.7 a) LAN ✓ b)WAN✓ c)PAN✓

5.8 explanation ✓ advantage ✓

VoIP — protocol that allows voice to be transmitted as data over a network — much cheaper, free software, conference calls etc.

VPN — allows users to log into a network from a remote location with same security — good for home or travel access to a company network.

GPS — location based computing used to find location of people/places/objects — tracking/geotagging/directions etc

5.9 The OS keeps the device on and working at all times even when the screen is dark ✓ It is monitoring for messages, phonecalls and notifications ✓

- 5.10 Any 2 ✓✓
- Apps need to transfer less data leading to faster speeds
- Give users a better interface
- Give users more control
- Allow auto updates and notifications

5.11 Skype ✓

5.12 Microblogging ✓

5.13 Gmail ✓

5.14 Video, Audio, Images. ✓

5.15 Any 2 ✓✓

- Lower the brightness of the display
- Close apps not in use
- Turn off GPS when not needed
- Turn off Bluetooth/WiFi when not needed
- Use headphones instead of speaker

6.1 Grade, Total ✓ Integer ✓

6.2 Conditional loop ✓ Unconditional loops execute a fixed number of times, Conditional loops execute while a condition is met ✓

6.3 Initialise - 1 ✓

Test - 3 ✓

Change - 7 ✓

6.4

Step	Grade	Total	While Grade<=12	Output
1	8	0		
2			True	
3			True	
6		150		
7			True	
3			True	
6		315		
7			True	
3			True	
6		475		
7			True	
3			True	
6		630		
7			True	
3			True	
6		800 ✓		
7			True	
3			False ✓	
9				Total learners in school 800 ✓

6.5 3. While Grade <= 0 (or 9999) - any out of range value ✓

5. Ask 'How many learners in grade' + Grade, 'Enter 0 to end' ✓

6.6 Edit box ✓

6.7 Presence check or required field. ✓

6.8 Radiogroup/buttons or Combobox or List ✓

6.9 Logical error ✓

6.10 else if (strtoint(SID[7]) > 4) and (SGender = 'M') then or
else if (strtoint(SID[7]) > 5) and (SGender = 'M') then

6.11 error

6.12 verification

6.13 algorithm - determine ages

count1 ← 0 ✓
count2 ← 0 ✓
count3 ← 0 ✓

Input N ✓

Do 1 from 1 to N ✓

Input AGE ✓

If AGE >= 18 AND AGE <= 25 THEN ✓

count1 ← count1 + 1

endif
If AGE >= 26 AND AGE <= 65 THEN ✓

Count2 ← count2 + 1

endif
If AGE > 65 THEN ✓

Count3 ← count3 + 1

endif
enddo
output count1, count2, count3 ✓