



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
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**GRADE 12**

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**INFORMATION TECHNOLOGY P2**

**MARKS: 150**

**TIME: 3 hours**



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This question paper consists of 15 pages.

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**INSTRUCTIONS AND INFORMATION**

1. This paper consists of SIX sections:

SECTION A: Short questions	(15)
SECTION B: System Technologies	(27)
SECTION C: Communication and Network Technologies	(24)
SECTION D: Data and Information Management	(24)
SECTION E: Solution Development	(33)
SECTION F: Integrated Scenario	(27)

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 Give ONE word/term for each of the following descriptions. Write only the word/term next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

- |        |   |     |
|--------|---|-----|
| 1.1.1  | To store files that are static, usually onto a secondary system   | (1) |
| 1.1.2  | The total amount of data that can be transferred from one point to another in a given period of time                                | (1) |
| 1.1.3  | Security based on the measure and identification of unique physical characteristics of a person                                     | (1) |
| 1.1.4  | A field that is used as a link to a field in another table  | (1) |
| 1.1.5  | To reorganise the parts of files and speed up the computer  | (1) |
| 1.1.6  | Software which is distributed freely, without source code, but can be used for a limited time or limited capabilities are available | (1) |
| 1.1.7  | Gaining access to and using someone else's internet connection without paying for it  | (1) |
| 1.1.8  | A built-in connection to another related web page and is indicated as text underlined in blue                                       | (1) |
| 1.1.9  | Study of the human body for the purpose of designing products that will better fit the way in which we function                     | (1) |
| 1.1.10 | Broken, outdated and discarded hardware that we neither want nor need   | (1) |

1.2 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 (1.2.1–1.2.5) in the ANSWER BOOK, for example 1.2.6 D.

1.2.1 Which ONE of the following refers to an encryption process used to authenticate the identity of the sender of an e-mail message?

- A Digital handshake
- B Digital divide
- C Digital certificate
- D Digital signature

(1)

1.2.2 Which term applies when a person behaves offensively towards another member of an e-mail news group, thereby inciting argumentative behaviour?

- A Flaming
- B Phishing
- C Lurking
- D Spamming

(1)

1.2.3 Which ONE of the following is NOT part of the machine cycle?

- A Fetch data
- B Decode instruction
- C Encode data
- D Execute instruction

(1)

1.2.4 A hardware interrupt is ...

- A a method used by peripherals to gain the CPU's attention when they need to communicate.
- B used to stop a printer when it continues printing an unwanted print job.
- C used by the memory of a computer to interrupt (or stop) a peripheral when communicating with the CPU.
- D the process that occurs when the power supply unit fails and the computer stops working.

(1)

1.2.5 Which ONE of the following Boolean expressions is correct?

EXPRESSION		RESULT
A	TRUE AND NOT FALSE	FALSE
B	FALSE AND (TRUE OR NOT FALSE)	TRUE
C	TRUE OR NOT (TRUE OR NOT FALSE)	TRUE
D	TRUE AND NOT (TRUE AND FALSE)	FALSE

(1)

**TOTAL SECTION A: 15**

**SECTION B: SYSTEMS TECHNOLOGIES****QUESTION 2**

Your brother is a production manager at a modern bakery which has a server, desktop computers, laptops, tablets and smartphones.

2.1 The devices all have preinstalled software that they use, namely Windows 10 Professional, Ubuntu 17, Nougat, Oreo, etc.

2.1.1 Name the category under which these software fall. (1)

2.1.2 Describe the software category that you have named in QUESTION 2.1.1. (1)

2.1.3 Which type of device would be associated with the Nougat or Oreo software? (1)

2.1.4 Mobile devices can now *multitask*. Explain the concept of *multitasking*. (2)

2.2 The term *convergence* is used to describe modern smartphones and tablets. What does the term *convergence* refer to? (1)

2.3 Tablets and smartphones run out of power quickly at the bakery, such that they are always on the charger.

Advise them on THREE ways to conserve battery power. (3)

2.4 The computers and devices all use either hard drives or Solid State Drives (SSDs).

Give TWO reasons why HDDs are still preferred over SSDs in computers and laptops. (2)

2.5 Some of the computers are a bit old and have limited RAM. They run the programs at a slower pace and you also notice that there is constant hard disk drive activity.

2.5.1 Which term is used for the problem described above? (1)

2.5.2 Describe how a computer manages to still open a number of applications despite having limited RAM. (2)

2.5.3 State TWO aspects that need to be taken into account when you try to upgrade the RAM on older computers. (2)

- 2.6 Two quotations, for new computers in the data capturing office with the specifications below, have been received.

COMPUTER 1	COMPUTER 2
Intel Core i7 2.6 GHz CPU	Intel Celeron 2.6 GHz CPU
2 GB RAM	2 GB RAM
3 TB HDD	3 TB HDD

- 2.6.1 Which computer will be rejected because it is too expensive? (1)
- 2.6.2 Identify the single component in the quotation that could clearly be identified as having an unnecessary high specification level. (1)
- 2.6.3 One of the CPUs contains multiple cores.  
Briefly explain why this feature improves the performance of the CPU. (2)
- 2.6.4 The processing speed of the CPU is directly influenced by the clock speed at which it runs. The clock speed of the CPU is normally much higher than the speed of the system clock.
- 2.6.4.1 Describe how the clock speed influences the processing speed of the CPU. (2)
- 2.6.4.2 Explain how it is possible that the CPU works at a much higher speed than the speed of the system clock. (2)
- 2.7 The computer motherboard uses both buses and point-to-point connections to transfer data.
- 2.7.1 What is the purpose of the internal bus on a motherboard? (1)
- 2.7.2 Name the components that the point-to-point connections connect. (2)

**TOTAL SECTION B: 27**

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

All the computing devices at the bakery are connected to a network. All the devices connect to the Internet through the server.

- 3.1 You tell your brother that the star topology is the most common topology used in networks.
- 3.1.1 Draw a labelled sketch to illustrate the layout of devices in a star topology. (3)
- 3.1.2 Give TWO reasons why a star topology is used in the majority of modern LANs. (2)
- 3.1.3 When asked, the network administrator says that the hybrid topology is the most popular topology. State the main characteristic of a hybrid network topology. (1)
- 3.2 An access point has been installed to create a wireless network (WLAN).
- 3.2.1 What is the main advantage of using a WLAN over a cable-based LAN? (1)
- 3.2.2 One access point is not sufficient for the bakery.  
Give TWO reasons why more than one access point may be needed. (2)
- 3.2.3 A password is required in order to access the WLAN.  
Why does having a password not guarantee the safety of the WLAN? (1)
- 3.3 Many managers choose to use their personal mobile devices to send and receive e-mail on the bakery's wireless network.
- 3.3.1 Push technology is used to send and receive e-mails on a mobile device. Explain what *push technology* is. (2)
- 3.3.2 E-mail attachments are usually not automatically downloaded on mobile devices.  
Give TWO reasons why this is the case. (2)
- 3.4 The marketing department networks with their clients via voice, video conferencing and instant messaging.
- 3.4.1 Name the protocol that is used for video conferencing. (1)
- 3.4.2 Briefly describe TWO challenges of video conferencing in South Africa. (2)
- 3.4.3 Most instant messaging programs are cross-platform.  
What does *cross-platform* mean? (1)

3.5 The managing director does not understand why, when he types the bakery's name in the web browser, he is not directed to the company's website.

3.5.1 Explain why a web browser cannot be effectively used to find information on the Web. (1)

3.5.2 How does using a search engine get around the problem mentioned in QUESTION 3.5.1? (1)

3.5.3 In general, what are the TWO biggest problems in terms of the search results produced by a typical search engine? (2)

3.5.4 Explain how a mediated search would assist with the problem mentioned in QUESTION 3.5.3. (2)

**TOTAL SECTION C: 24**



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

Information about the clients, suppliers and inventory is kept at the bakery.

- 4.1 A server database is currently in use. Differentiate between a *desktop database* and a *server database*. (2)
- 4.2 The integrity of the database needs to be maintained. Name the TWO general ways in which data integrity can be ensured in a database. (2)
- 4.3 Name and briefly describe THREE characteristics of quality data. (3)
- 4.4 Access control is an essential part of protecting data. List TWO methods of controlling access to data. (2)
- 4.5 Maintaining the data is an essential part in the management of data. What is involved in data maintenance? (1)

The following information must be captured in a ***suppliers table*** and an ***orders table*** to keep track of all inventory supplied and ordered by the bakery.

Field name	Data type
SupplierID	AutoNumber
SupplierName	Text
SupplierContactNumber	Text
OrderedItemName	Text
OrderedItemUnitPrice	Number
DateOrdered	Date/Time
QuantityOrdered	Number
DeliveryDate	Date/Time
DeliveryCost	Currency

- 4.6 It is observed that this database is not normalised.
- 4.6.1 Define the term *normalisation*. (2)
- 4.6.2 What is a *Primary Key*? (1)
- 4.6.2 Use a diagram to split the databases into TWO tables. Clearly indicate the Names of the Tables, the Primary and Foreign Keys as well as their relationships. (6)

- 4.7 One of the tables in the bakery's database, **tblproducts**, contains descriptions and prices of the bakery's products.

P_ID	Name	Description	Price
1	Bread	Baked fresh everyday	2.99
2	Strawberry Shortcake	Made with organic strawberries from our garden	9.99
3	Apple Pie	Second only to your mom's pie	12.99
4	Pecan Pe	If you like pecans, this is for you	10.99
5	Lemon Pie	Made with the best lemons in the world	11.99
6	Cupcakes	Your kids and the kid in you will love these	7.99

In order to create queries of the table, **tblproducts**, SQL is used.

- 4.7.1 Write a statement to show all the information from the table arranged in ascending order according to the price. (2)
- 4.7.2 Write a statement that will correct the spelling of "Pecan Pe" to "Pecan Pie". (3)

**TOTAL SECTION D: 24**

## SECTION E: SOLUTION DEVELOPMENT

### QUESTION 5

5.1 An application is being designed to allow Wi-Fi users to logon to the network.

The first letter of every word in the text fields must be capitalised (for example 'Mr July August' or 'Miss Merry September').

Write an algorithm that will manipulate a string as follows:

- All spaces must be removed
- The first letter of every word must be a capital letter
- Eg. Mr july august → MrJulyAugust

**NOTE:** You MUST write your algorithm in pseudocode – do NOT use a programming language. (8)

5.2 In order to keep track of the amount of time they spend on the computer and how much time is spent on the Internet, an object class has been designed to do this job.

Study the class diagram below and then answer the questions that follow. The names of the methods indicate what they should do.

ATTRIBUTES	METHODS
<ul style="list-style-type: none"> <li>• UserCode</li> <li>• TotalSessions</li> <li>• TotalTime</li> <li>• TotalInternetTime</li> </ul>	<ul style="list-style-type: none"> <li>• changeUserCode</li> <li>• toString</li> <li>• getFrequency</li> <li>• addSession(TimeIn, TimeOut)</li> <li>• resetAll</li> <li>• setInternetTime(InternetTime)</li> </ul>

5.2.1 What will the toString method be used for? (2)

5.2.2 Explain the purpose of the following methods in object-oriented programming

(a) mutator methods; give an example (2)

(b) accessor methods; give an example (2)

5.2.3 Methods are normally declared as public and attributes as private.

(a) Explain why methods are normally declared as public and not as private. (1)

(b) What is the reason for declaring an instance attribute as private and not as public? (1)

5.2.4 Methods may be declared when designing your class. Differentiate between **parameterised** and **non-parameterised** methods. (2)

5.3 Debugging takes up a great deal of programming time. Syntax errors, runtime errors and logical errors have to be corrected.

5.3.1 Explain each of the errors below AND give ONE reason why/ example of where the error will occur.

(a) Syntax error (2)

(b) Runtime error (2)

(c) Logical error (2)

5.3.2 Give ONE example of how to identify each of the error types in QUESTION 5.3.1. (3)

5.4 Study the given code and answer the questions.

```
begin
1   sCardHolder := cmbCardNumbers.items[cmbCardNumbers.ItemIndex];
2   sCellNumber := lblCellNumber.Caption;
3   sLoyaltyPoints := lblLoyaltyPoints.Caption;
4   objCardholder := TCardHolder.create(sCardHolder, sCellNumber,
                                         StrToInt(sLoyaltyPoints));
5   sAccess := edtCode.Text;
6   if objCardholder.isCorrect(sAccess) then
begin
7       showMessage('The access code is correct. ');
8       rTotalSpent := 0;
9       rTotalHealth := 0;
10      iVisits := 0;
11      assignFile(myFile, 'DataJanuary2017.txt');
12      reset(myFile);
13      while not eof(myFile) do
begin
14          readln(myFile, sLineOne);
15          readln(myFile, sLineTwo);
16          readln(myFile, sLineThree);
17          if sLineOne = sCardHolder then
begin
18              rTotalSpent := rTotalSpent + StrToFloat(sLineTwo);
19              rTotalHealth := rTotalHealth + StrToFloat(sLineThree);
20              inc(iVisits);
end; // end if
end; // end while
21      closeFile(myFile);
22      objCardholder.increaseLoyaltyPoints(rTotalSpent);
23      objCardholder.setNumVisits(iVisits);
24      objCardholder.updateHealthLevel(rTotalHealth, rTotalSpent);
25      btnQuest222.Enabled := true;
end // end isCorrect
26  else
begin
27      showMessage('Incorrect access code. ');
28      edtCode.Clear;
end;
```

- 5.4.1 What do we call the method used in line 4? (1)
- 5.4.2 Explain line 4. (1)
- 5.4.3 Is the method in line 6 a procedure or a function? (1)
- 5.4.4 What does line 12 do? (1)
- 5.4.5 Rewrite line 20 in another way. (1)
- 5.4.6 Why is it important to initialise variables (for example line 8, 9 and 10)? (1)

**TOTAL SECTION E: 33**

**SECTION F: INTEGRATED SCENARIO****QUESTION 6**

Maintaining the database, securing the hardware and software from threats and keeping a healthy Internet and social media presence are required.

6.1 Parallel data set is a term associated with databases.

6.1.1 Explain what a *parallel data set* is and what it is used for. (2)

6.1.2 Give the main disadvantage of implementing parallel data sets. (2)

6.1.3 Why should parallel data sets be kept in separate locations? (1)

6.2 The management has decided to revamp their current static website into a dynamic website.

6.2.1 Give TWO ways in which you can tell if a web page is static or dynamic, simply by examining the URL. (2)

6.2.2 Give THREE advantages of dynamic web pages. (3)

6.3 The manager has been told to make a daily backup of her work and to take it home on the external hard drive that was purchased for this purpose.

6.3.1 Why is it advisable to take the external hard drive home each night? (1)

6.3.2 Give THREE reasons why it is critical to back up or make copies of files regularly. (3)

6.3.3 The manager is finding that her external hard drive is only just managing to store the contents of her computer's hard drive. Give THREE ways in which she can reduce the number of files she needs to back up. (3)

6.4 Customers are able to purchase goods and services through the bakery website. The website uses encryption to ensure that client details are secure.

6.4.1 How can clients ascertain that the bakery's website is secure by looking at the information on their web browsers? (1)

6.4.2 Briefly describe what *encryption* is. (2)

6.4.3 Customers are encouraged to use 'strong' passwords. Give THREE guidelines to follow when creating strong passwords. (3)

6.5 Almost all the users at work have social networking accounts. However, it is discouraged to visit them during working times.

6.5.1 Describe TWO ways in which social networking tools can impair your concentration and make you less productive. (2)

6.5.2 Almost all social networking tools, sites and apps encourage you to share information. Give an advantage and a disadvantage of sharing information in this context. (2)

**TOTAL SECTION F: 27**

**GRAND TOTAL: 150**

