



PINETOWN DISTRICT

**Preparatory
Examination
2025**

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Grade 12

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Information Technology P2

Marks: 150

Time: 3 hours

This question paper consists of 14 pages including the cover page.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX sections:



Section A:	Short questions	(20)
Section B:	System Technologies	(25)
Section C:	Communication and Network Technologies	(22)
Section D:	Data and Information Management	(23)
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 ONE

- 1.1 Multiple choice:** Various options are given as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) in your answer book.

1.1.1 What is the purpose of the ROM?

- A) Connects computers to a network and the internet.
- B) It stores the BIOS, the motherboard's operating software.
- C) Fast, long-term storage of data used on the computer.
- D) Very high-speed storage which temporarily stores data the CPU is using.

1.1.2 A unique number that consists of four sets of numbers from 0-255, separated by periods/dots, e.g. 196.14.2.244:

- A) Voice over internet protocol
- B) IP address
- C) URL
- D) Domain name

1.1.3 ... refers to a group of compromised computers or mobile devices connected to a network used to attack other networks.

- A) Botnet
- B) RAID
- C) Zombie cookie
- D) Skynet

1.1.4 What is the resulting data type of the 'MOD' operator in Delphi in programming?

- A) Boolean
- B) String
- C) Real
- D) Integer

1.1.5 A subroutine that consists of a set of instructions to perform a specific task and which normally delivers a result.

- A) Parameter
- B) Procedure
- C) Function
- D) Argument

1.1.6 The integration of digital information with the user's environment in real time:

- A) Virtual reality
- B) VPN
- C) Augmented reality
- D) Geotagging

1.1.7 Static web pages where all users see the same content:

- A) Web 1.0
- B) Web 2.0
- C) Web 3.0
- D) Semantic web

1.1.8 ... is a temporary storage area.

- A) ROM
- B) SSD
- C) HDD
- D) Cache memory

1.1.9 Which ONE of the following is NOT a reason for the digital divide?

- A) Lack of internet connection in certain areas.
- B) People with disabilities find it difficult to use ICT.
- C) Information overload.
- D) Lack of exposure to technology.

1.1.10 Which ONE of the following is not part of the process to transfer data to a data warehouse?

- A) analyse the data
- B) load the data to the data warehouse
- C) transfer the data to a temporary work area
- D) transform the data

(10 x 1) (10)

1.2 Give ONE word/term for each of the following descriptions.

Write only the word/term next to the question numbers (1.2.1 to 1.2.10)

- 1.2.1 Refers to applications that are hosted on the cloud and that users pay a monthly subscription to access. (1)
- 1.2.2 A technique used by the operating system where tasks and processes are split up between the different CPU cores of a computer to be processed in parallel. (1)
- 1.2.3 A trend whereby separate technologies and functions from multiple devices are combined into a single multi-purpose device. (1)
- 1.2.4 The reorganisation of files on a hard disk drive that speeds up access to files. (1)
- 1.2.5 The ability to plug in or remove a device from a computer without switching off a computer. (1)
- 1.2.6 Collecting data about a person's spending habits when paying with a credit card. (1)
- 1.2.7 A set of programs designed to fraudulently use administrator rights to gain control of a computer to perform illegal activities. (1)
- 1.2.8 A signal created and sent to the CPU that is caused by some action taken by a hardware device. (1)
- 1.2.9 A type of technology that allows a host operating system to run other operating systems on the same device at the same time. (1)
- 1.2.10 Any attempt to manipulate or "con" someone into installing malware or giving out sensitive or personal information. (1)

(10 x 1) (10)

TOTAL SECTION A: [20]

SECTION B: SYSTEM TECHNOLOGIES

QUESTION TWO

- 2.1 *Some computers are built using a modular design.*
- 2.1.1 Explain the term modular design. (1)
- 2.1.2 State why modular design is used. (1)
- 2.2 Having a high-performance computer/laptop is crucial for power users.
- 2.2.1 Explain how bus performance can have an influence on the performance of a computer system. (2)
- 2.2.2 Discuss how the RAM influences the performance of a computer system. (2)
- 2.2.3 *Journalists use their laptops for word processing, research and to upload articles to their company's electronic database only.*
Would you classify journalists as power users or SOHO users? (1)
- 2.3 The most important software that needs to be installed on a computer is the operating system.
- 2.3.1 Name TWO tasks of the operating system. (2)
- 2.3.2 Explain the concept *open source* in the context of FOSS. (2)
- 2.3.3 State TWO disadvantages of using free open-source software. (2)
- 2.3.4 Virtual memory is managed by the operating system. Clearly explain what *virtual memory* is. (2)
- 2.3.5 Provide TWO ways to prevent thrashing when using virtual memory. (2)
- 2.4 Taking IT as a subject means you will learn to use a programming language to develop software. Delphi is a high-level programming language. High-level languages make use of compilers and interpreters.
- 2.4.1 How does an *interpreter* work? (1)
- 2.4.2 How does a *compiler* work? (1)
- 2.5 Except for gaming needs, what other motivation might there be for having a dedicated graphics card installed? (1)
- 2.6 When a computer's storage is depleted, it can cause the computer to slow down. State TWO ways to free up storage space on a computer. (2)

- 2.7 Explain ONE advantage of using biometric authentication over traditional password based authentication. (2)
- 2.8 Expand the acronym VRAM. (1)

TOTAL SECTION B: [25]

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

The Jedi Academy, a private learning centre, is setting up a new computer network to manage its growing digital resources and communication between staff and learners. Some teachers work at the Academy, while others connect remotely from home.

The Academy also provides free Wi-Fi access for learners in the training halls.

- 3.1 Provide TWO advantages of networking computers compared to using stand-alone computers. (2)
- 3.2 The Academy has decided to use a client-server network instead of a peer-to-peer network.
- 3.2.1 State TWO disadvantages of using a peer-to-peer network in this scenario. (2)
- 3.2.2 Differentiate between a *server* and a *workstation*. (2)
- 3.2.3 State TWO functions of a network switch. (2)
- 3.2.4 The Academy wants to allow learners to connect wirelessly in the training hall.
What is the name of an additional network device that must be purchased to change the LAN into a WLAN? (1)
- 3.3 The Jedi Academy has expanded to two campuses located in different suburbs. The IT technician must ensure reliable communication between the two sites and efficient IP address allocation.
- 3.3.1 Explain the role of an ISP in enabling communication between the two campuses. (2)



3.3.2 The Academy has been allocated a range of IP addresses.

(a) Differentiate between *public* and *private* IP addresses. (2)

(b) State ONE advantage of using private IP addresses inside the Academy's network. (1)

3.3.3 Suggest a suitable topology for connecting devices within each campus and motivate your choice. (3)

3.4 The IT department warns learners about cybersecurity threats.

3.4.1 What do we call a form of fraud where a large group of low-paid workers are hired to click on paid advertising links to artificially inflate website traffic? (1)

3.4.2 The Academy provides free Wi-Fi for learners and visitors.

(a) State TWO risks of offering free Wi-Fi to the public. (2)

(b) Suggest TWO measures to secure the Academy's internal network while still offering free Wi-Fi. (2)

TOTAL SECTION C: [22]

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

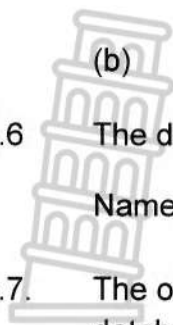
A database is needed for managing the Races for runners. A list of fields for the potential database and tables have been provided.

Field Name	Description
ID	Used to uniquely identify each runner
Name	The name of a runner
Surname	The surname of a runner
Date of Birth	The date of birth of a runner
Citizenship	Whether the runner is local or international
RaceID	Used to uniquely identify a race
Distance	Distance in km of the race, e.g. 5km, 10km
StartPoint	Where the race starts from(location)
EndPoint	Where the race ends at(location)
TimeCompleted	How many minutes did a runner finish it in

- 4.1 Provide an alternate field name for the first field in the table above. (1)
- 4.2 Identify the field and correct the field with a bad naming convention. (1)
- 4.3 Normalise the above table by providing relevant table names and places the correct fields in each table. Use format provided. Indicate primary key and foreign key with the most suitable relationship.

Table Name	Table Name

- 4.4 The purpose of normalisation is to reduce redundancy. Explain how redundancy can affect the efficiency of the database. (2)
- 4.5 Each field needs to have a suitable data type. Provide suitable data types for the following fields. (1)
 - (a) Name



- (b) Distance (1)
- 4.6 The data integrity of the database needs to be upheld. (2)
Name TWO ways in which a programmer can ensure this is done.
- 4.7 The organisers of the races would like to know if any changes are made on the database. (2)
Name and explain how this can take place.
- 4.8 Data quality needs to be ensured in the database. (2)
Provide TWO characteristics of quality data, apart from correctness which is ensured by validation.
- 4.9 Explain why record locking is necessary when different staff members are working on the same table in the database. (1)
- 4.10 Some of the data is collected by means of invisible data capturing. (2)
Indicate TWO ways in which data is captured invisibly.
- 4.11 In many professional races, runners are given RFID tags to automatically capture their times at the start and finish lines. (2)
Explain ONE advantage for the organisers and ONE advantage for the runners of using RFID in this context.

TOTAL SECTION D: [23]

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

- 5.1 The backend developers are experiencing some difficulty in debugging the source code. Answer the following questions to assist them:
- 5.1.1 For each of the following statements, the variable **x** will receive a random value. Write down the smallest possible value and the largest possible value of **x** to indicate the range of numbers possible. E.g., 1-10
- (a) `x := Random(10);` (2)



(b) `x := Random(99) + 7;` (2)

(c) `x := 1 * (Random(101)/100);` (2)

5.1.2

Review the code snippet below and answer the questions that follow:

```

1  var
2    arrNums: Array[1..10] of Integer;
3    i, iTemp : Integer;
4    bSorted : Boolean;
5  begin
6    for i := 1 to 10 do
7      arrNums[i] := random(100);
8    bSorted := false;
9    while not bSorted do
10     begin
11       bSorted := true;
12       for i := 1 to 10 do
13         begin
14           if arrNums[i] < arrNums[i+1] then
15             begin
16               bSorted := false;
17               iTemp := arrNums[i];
18               arrNums[i] := arrNums[i+1];
19               arrNums[i+1] := iTemp;
20             end;
21         end;
22     end;

```

(a) What do you think the intended purpose of the code was? (2)

(b) The code above will produce an error. Predict the error and indicate how the code can be modified to prevent the error. (3)

(c) What is the purpose of the boolean variable in the code? (1)

(d) In line 17-19 the values of the array are swapped. Could the same not be achieved by the code below? Motivate your answer.

```

arrNums[i] := arrNums[i+1];
arrNums[i+1] := arrNums[i];

```

(3)

5.2 Look at the UML class diagram below and answer the following questions:



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TStockItem
- fStockId : string; - fPrice : double - fQuantity : Integer; - fDescription : string;
+ <constructor> Create(); + getPrice: double + sale(quantity : integer); + restock(amount: integer); + setPrice(amount: Double);

- 5.2.1 What is the purpose of the – (minus)and + (plus) in the diagram? (2)
- 5.2.2 Identify one accessor method. (1)
- 5.2.3 Identify one mutator method. (1)
- 5.2.4 Write down ONE reason why Object Orientated Programming is necessary for modern computer programming. (1)



TOTAL SECTION E: [20]

SECTION F: INTEGRATED SCENARIO

QUESTION 6

TechWave Solutions is a dynamic web development company specialising in creating innovative and user-friendly websites for small businesses. Recently, they undertook a project to redesign the website for a local health and fitness centre, incorporating e-commerce features and an interactive booking system.

- 6.1 The company is investigating all the possible technologies to use to create the website for the fitness centre.
- 6.1.1 What is HTML and what is it used for? (2)
- 6.1.2 Explain what CSS (Cascading Style Sheets) is. (2)
- 6.1.3 State TWO advantages of using CSS. (2)



6.1.4 Most dynamic, interactive web pages still need all data and elements to be downloaded at once to the browser.

- (a) Provide TWO problems associated with a single web page for which all data and elements need to be downloaded at once to the browser. (2)
- (b) Give the name of the technology that gets around the problems highlighted in the previous question (6.1.4 (a)) and briefly describe how it gets around these problems. (3)

6.2 The internet provides users with plentiful resources.

6.2.1 Explain the difference between the internet and the WWW. (2)

6.2.2 What is the purpose of a search engine? (1)

6.2.3 Suggest why a web browser cannot be effectively used to find information on the Internet or Web. (2)

6.3 The web has evolved over the past few years and is still continually evolving.

6.3.1 Explain what a *customised* or *profiled search* is by referring to how a company like *Google* would be able to conduct such a search. (3)

6.3.2 *Mediated* or *curated* searches can follow two main models for generating their content and even sometimes combine these two models to try to get the best of both worlds.

Briefly outline how these two different methods work. (2)

6.3.3 The company need a huge amount of processing power to host all the websites for their clients.

(a) Define distributed computing. (2)

(b) Provide TWO advantages of utilising distributed computing. (2)

6.4 Users on a network is susceptible to attacks from social engineers.

6.4.1 Define the term *social engineer*. (2)

6.4.2 Explain how Phishing works. (2)



6.4.3 List TWO methods how a user can protect themselves from social engineering. (2)

6.5 There is a lot of discussion around the Metaverse and its many possible applications.

6.5.1 Briefly explain what the Metaverse is. (2)

6.5.2 Name TWO hardware component needed to use the Metaverse effectively. (2)

6.6 There are many computer-related crimes and dangers that exist and are a cause of concern for the company.

6.6.1 A DDoS attack is one of the many dangers that the company is concerned about.

Explain what a DDoS attack is. (2)

6.6.2 Explain what a Botnet is and how they can be used in a DDoS attack. (3)



TOTAL SECTION F: [40]

TOTAL: [150]