

Grade 12 Information Technology: Programming & Databases Study Guide

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Free Study Resources for South African Matric Learners

1. Object-Oriented Programming (OOP) Concepts

- Class: blueprint/template for creating objects; defines attributes and methods
- Object: an instance of a class; has its own state (attribute values)
- Encapsulation: hiding internal data (private fields); access through getters/setters
- Inheritance: child class inherits attributes and methods from parent class
- Polymorphism: same method name behaves differently in different classes (override)
- Abstraction: hiding complex implementation details; exposing only what is needed

2. Delphi / Java Key Syntax

Class Declaration

Delphi:

```
TAnimal = class
private
    fName: string;
public
    constructor Create(aName: string);
    function getName: string;
end;
```

Java:

```
public class Animal {
    private String name;
    public Animal(String name) { this.name = name; }
    public String getName() { return name; }
}
```

3. SQL (Structured Query Language)

Basic SELECT

```
SELECT column1, column2
FROM tablename
WHERE condition
ORDER BY column ASC/DESC
GROUP BY column
HAVING aggregate_condition;
```

Aggregate Functions

COUNT(*):	Number of rows
SUM(col):	Total of numeric column
AVG(col):	Average of numeric column
MAX(col) / MIN(col):	Highest/lowest value

Joins

- INNER JOIN: returns rows where condition matches in BOTH tables

-

LEFT JOIN: all rows from left table, matched rows from right (NULLs for no match)

- RIGHT JOIN: all from right, matched from left

4. Networks & Internet

- LAN: Local Area Network (within a building); WAN: Wide Area Network (across cities/countries)
- IP Address: unique identifier for device on network (IPv4: 4 groups of numbers)
- DNS: Domain Name System - converts domain names to IP addresses
- HTTP/HTTPS: protocols for web; HTTPS is encrypted (SSL/TLS)
- Router: connects networks; assigns IP addresses (DHCP)
- Bandwidth: data transfer rate (Mbps); Latency: delay (ms)

5. Social Implications of Technology

- Cybercrime: hacking, phishing, identity theft, cyberbullying
- Privacy: data collection by companies; POPIA (Protection of Personal Information Act, SA)
- Digital divide: unequal access to technology and internet
- Intellectual property: copyright, plagiarism, licensing (open source vs proprietary)
- Health: screen time, posture, eye strain, social isolation

TIP In SQL exam questions: write keywords in CAPS. Always check what data the question is asking for. Use `table.column` notation when joining tables to avoid ambiguity.