



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
INNOVATION, SCIENCE AND TECHNOLOGY
DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL DIPLOMA

IN

INFORMATION TECHNOLOGY

MODULE: Object Oriented Programming (Theory) PAPER NO: 553/23/M05A

DURATION: 3 Hours

JUNE 2026 EXAMINATION

REQUIREMENTS

Answer Booklet

INSTRUCTIONS TO CANDIDATES

Answer all questions.

This paper consists of 4 printed pages.

QUESTION 1

Describe any five (5) components of Visual Studio IDE. (10 marks)

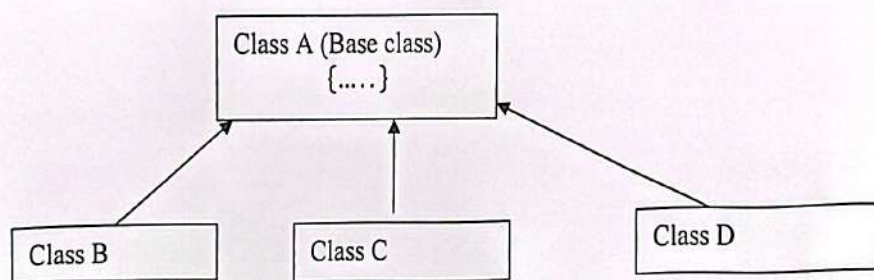
Create a class named "Car" with variables colour, make and model. Use it to create an object called carObject to print the value of the variables in the Main function. (5 marks)

QUESTION 2

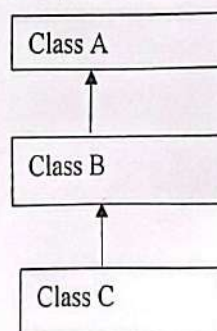
a) Outline any five (5) differences between method overloading and method overriding. (10 marks)

b) The following diagrams represent:

i) Hierarchical inheritance. Write the C# syntax for it. (4 marks)



ii) Multilevel inheritance, write the C# sharp syntax for it



(3 marks)

Distinguish between:

- | | | |
|------|---------------------------------|-----------|
| i) | Class and object | (2 marks) |
| ii) | Constructor and destructor | (2 marks) |
| iii) | Static and dynamic polymorphism | (2 marks) |

QUESTION 3

- | | | |
|----|--|-----------|
| a) | Explain event publishing and subscribing. | (4 marks) |
| b) | State three (3) reasons for using events. | (3 marks) |
| c) | Describe the use of breakpoints. | (2 marks) |
| d) | Distinguish console application from windows form application. | (3 marks) |
| e) | Discuss the importance of version control. | (3 marks) |

QUESTION 4

- | | | |
|----|---|-----------|
| a) | Outline the following user interface guidelines: | |
| | i) Motion design | (2 marks) |
| | ii) Interaction design | (2 marks) |
| | iii) Branding and visual identity | (2 marks) |
| | iv) Layout and visual hierarchy | (2 marks) |
| | v) Accessibility and inclusivity | (2 marks) |
| b) | Explain the process of creating responsive and adaptive GUI applications. | (5 marks) |

QUESTION 5

- | | | |
|----|--|-----------|
| a) | Outline the three (3) programming constructs. | (6 marks) |
| b) | Distinguish between exceptions and errors. | (2 marks) |
| c) | Distinguish the for loop from the for each loop. | (2 marks) |
| d) | Explain the process of creating user-defined exceptions. | (2 marks) |

QUESTION 6

- a) Write code snippet/segment to implement the following jagged array and iterate the elements:

{1,2}
{3,4,5}
{6,7,8,9}

(10 marks)

- b) Outline the following terms:

- i) Filestream
- ii) StreamWriter
- iii) StreamReader
- iv) TextWriter
- v) TextReader

(10 marks)

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**HIGHER EDUCATION EXAMINATIONS COUNCIL
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NATIONAL DIPLOMA

IN

INFORMATION TECHNOLOGY

SUBJECT: Web Development(Theory)

PAPER NO: 553/23/M06A

DURATION: 3 Hours

JUNE 2026 EXAMINATION

REQUIREMENTS

Answer booklet.

INSTRUCTIONS TO CANDIDATE

Answer all questions.

QUESTION 1

- (a) Evaluate four (4) reasons why organisations need websites in today's business environment. (4 marks)
- (b) Discuss three (3) reasons why it is crucial to define clear business goals before starting website development. (6 marks)
- (c) Describe five (5) guidelines for user interface and user experience design. (10 marks)

QUESTION 2

- (a) Outline four (4) factors that should be considered when evaluating a web development tool. (8 marks)
- (b) Discuss how artificial Intelligence can be used in website template design. Focus on at least four (4) aspects. (8 marks)
- (c) Outline four (4) features of a typical website development tool. (4 marks)

QUESTION 3

- (a) Using a website builder versus coding yourself is a raging debate amongst developers. In contributing to this debate, discuss five (5) advantages of using a website builder instead of coding a website from scratch. (10 marks)
- (b) Distinguish between a static and a dynamic website. (6 marks)
- (c) Outline four (4) factors you would consider when evaluating a content management systems. (4 marks)

QUESTION 4

- (a) Differentiate between server side and client side website programming. (4 marks)
- (b) A potential client is concerned about how search engines will become aware of his newly developed site and include it in their search results. In response, briefly explain the three processes used by search engines from collection of information about the websites to their inclusion on the results of a search query. (12 marks)
- (c) DigiProducts , a computer hardware sales company is hesitant about registering multiple domain name variations (e.g. DigiProducts.com and DigiProduct.com), explain two (2) advantages that arise from doing so. (4 marks)

QUESTION 5

- (a) Publishing a website to the internet exposes it to a variety of threats and vulnerabilities. Outline five (5) common web security threats and vulnerabilities. (10 marks)
- (b) Describe what a Git repository is and explain its purpose in web application development. (4 marks)
- (c) Discuss two ways of obtaining a Git Repository. In your response indicate two advantages of each. (6 marks)

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**HIGHER EDUCATION EXAMINATIONS COUNCIL
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NATIONAL DIPLOMA

IN

INFORMATION TECHNOLOGY

**SUBJECT: Operating Systems
Administration (Theory)**

PAPER NO: 553/23/M08A

DURATION: 3 Hours

JUNE 2026 EXAMINATION

REQUIREMENTS

Answer booklet.

INSTRUCTIONS TO CANDIDATE

Answer all questions.

QUESTION 1

- (a) Analyse the role of interrupt handling mechanism in ensuring the efficient and responsive operation of modern operating systems. (9 marks)
- (b) Explain how exo-kernel operating systems address the hurdle of modularity, extensibility and resources management in modern computing environments (6 marks)
- (c) Enumerate any five (5) advantages of virtualisation. (5 marks)

QUESTION 2

- (a) Evaluate how virtualisation technology serves as the underlying foundation for the delivery of cloud computing. (5 marks)
- (b) Describe five (5) different types of scheduling algorithms used in operating systems. (10 marks)
- (c)
 - (i) Define the term Deadlock in operating systems. (2 marks)
 - (ii) Describe the necessary conditions for a deadlock to occur in an Operating System. (3 marks)

QUESTION 3

- (a) Explain the following contiguous memory allocation algorithms
 - (i) first fit (2 marks)
 - (ii) best fit (2 marks)
 - (iii) worst fit (2 marks)
- (b) Define “Thrashing” in Operating Systems. (3 marks)
- (c) Explain the difference between external fragmentation and internal fragmentation. (6 marks)
- (d) Discuss the types of security controls that can be implemented to secure operating systems (5 marks)

QUESTION 4

- (a) Describe the role of Access Control Lists (ACLs) in ensuring security in operating systems. (5 marks)
- (b) Enumerate five (5) steps required to install a Linux operating system on a personal computer. (5 marks)

PAPER NO: 553/23/M08A – OPERATING SYSTEMS ADMINISTRATION
THEORY

- (i) Outline distinctions between the installation processes of Linux and Windows operating systems. (10 marks)

QUESTION 5

- (a) Describe the role of a software firewall in operating systems. (5 marks)
- (b) Describe the process of managing software updates in a Windows based operating system using Windows Update. (10 marks)
- (c) Outline the process of removing software packages in a Linux- based operating system using package managers such as apt or yum. (5 marks)

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NATIONAL DIPLOMA

IN

INFORMATION TECHNOLOGY

MODULE: Software Engineering

PAPER NO: 553/23/M03

DURATION: 3 hours

JUNE 2026 EXAMINATION

REQUIREMENTS

Answer booklet

INSTRUCTIONS TO CANDIDATE

Answer all questions.

This paper consists of 3 printed page.

QUESTION 1

- a) Distinguish between bottom up and top down approach in software engineering. (6 marks)
- b) i) Explain any two (2) types of feasibility study. (4 marks)
- ii) Critically analyse any two (2) fact finding methods used in software engineering. In your response evaluate their strengths and weaknesses. (10 marks)

QUESTION 2

- a) Clarify the following concepts:
- i) Cohesion (2 marks)
- ii) Coupling (2 marks)
- b) In the context of designing a user interface for a new system, employ any three (3) principles you would prioritize to enhance user experience. (6 marks)
- c) i) Analyse any three (3) object-oriented programming (OOP) concepts. (6 marks)
- ii) Differentiate logical design from conceptual design in software engineering. (4 marks)

QUESTION 3

- a) Discuss integration testing in software engineering. (4 marks)
- b) Investigate any three (3) key components of the .NET framework. (6 marks)
- c) Demonstrate your understanding of the following maintenance and deployment terms:
- i) Corrective software maintenance (2 marks)
- ii) Adaptive software maintenance (2 marks)
- iii) Preventive software maintenance (2 marks)
- iv) Perfective software maintenance (2 marks)
- v) Software deployment (2 marks)

QUESTION 4

- a) Describe the following software development methodologies.
- i) Waterfall model (4 marks)
 - ii) SCRUM (4 marks)
 - iii) RAD (4 marks)
- b) Ascertain any four (4) key differences between SSADM and SDLC. (8 marks)

QUESTION 5

- a) i) Deduce your understanding of the term test script. (2 marks)
- ii) With the aid of an example clarify why you would choose verification testing over validation testing. (8 marks)
- b) i) Conduct an analysis on any four (4) levels of software testing. (8 marks)
- ii) Suggest any two (2) reasons for regression testing. (2 marks)

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NATIONAL DIPLOMA

IN

INFORMATION TECHNOLOGY

MODULE: Object Oriented Programming (Theory) PAPER NO: 553/23/M05A

DURATION: 3 Hours

JUNE 2026 EXAMINATION

REQUIREMENTS

Answer Booklet

INSTRUCTIONS TO CANDIDATES

Answer all questions.

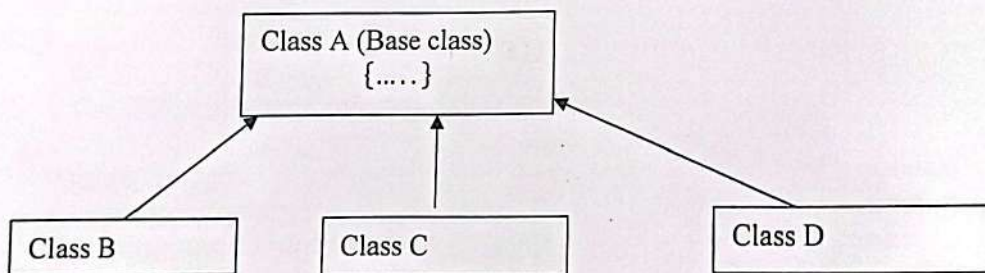
This paper consists of 4 printed pages.

QUESTION 1

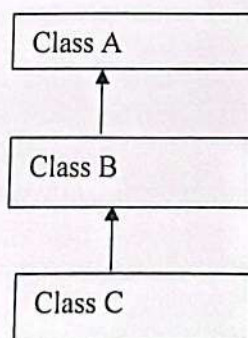
- a) Describe any five (5) components of Visual Studio IDE. (10 marks)
- b) Create a class named "Car" with variables colour, make and model. Use it to create an object called carObject to print the value of the variables in the Main function. (5 marks)

QUESTION 2

- a) Outline any five (5) differences between method overloading and method overriding. (10 marks)
- b) The following diagrams represent:
 - i) Hierarchical inheritance. Write the C# syntax for it. (4 marks)



- ii) Multilevel inheritance, write the C# sharp syntax for it



(3 marks)

c) Distinguish between:

- i) Class and object (2 marks)
- ii) Constructor and destructor (2 marks)
- iii) Static and dynamic polymorphism (2 marks)

QUESTION 3

- a) Explain event publishing and subscribing. (4 marks)
- b) State three (3) reasons for using events. (3 marks)
- c) Describe the use of breakpoints. (2 marks)
- d) Distinguish console application from windows form application. (3 marks)
- e) Discuss the importance of version control. (3 marks)

QUESTION 4

- a) Outline the following user interface guidelines:
 - i) Motion design (2 marks)
 - ii) Interaction design (2 marks)
 - iii) Branding and visual identity (2 marks)
 - iv) Layout and visual hierarchy (2 marks)
 - v) Accessibility and inclusivity (2 marks)
- b) Explain the process of creating responsive and adaptive GUI applications. (5 marks)

QUESTION 5

- a) Outline the three (3) programming constructs. (6 marks)
- b) Distinguish between exceptions and errors. (2 marks)
- c) Distinguish the for loop from the for each loop. (2 marks)
- d) Explain the process of creating user-defined exceptions. (2 marks)

QUESTION 6

- a) Write code snippet/segment to implement the following jagged array and iterate the elements:

{1,2}
{3,4,5}
{6,7,8,9}

(10 marks)

- b) Outline the following terms:

- i) Filestream
- ii) StreamWriter
- iii) StreamReader
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(10 marks)

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NATIONAL DIPLOMA

IN

INFORMATION TECHNOLOGY

MODULE: Design and Analysis of Algorithms PAPER NO: 553/23/M09

DURATION: 3 Hours

JUNE 2026 EXAMINATION

REQUIREMENTS

Answer booklet

INSTRUCTIONS TO CANDIDATE

Answer all questions

This paper consists of 4 printed pages.

QUESTION 1

- a) i) Differentiate Procedure Oriented Programming (POP) and Object Oriented Programming (OOP). (6 marks)
- ii) Distinguish between static and dynamic data structures. (4 marks)
- b) i) Write a recursive function for binary search. (6 marks)
- ii) Outline the two (2) main types of recursion. (4 marks)

QUESTION 2

- a) Describe the following algorithm complexities:
- i) Best case (2 marks)
- ii) Worst case (2 marks)
- iii) Average case (2 marks)
- b) i) Determine the running time of the code segment below:
- ```
for(int i=1; i<=N; i++)
{
 for (int k=1; k<=N;k++)
 {
 y=a + 8;
 }
 m=b;
}
```
- (6 marks)
- c) Write an algorithm for selection sort and calculate its time complexity. (8 marks)

QUESTION 3

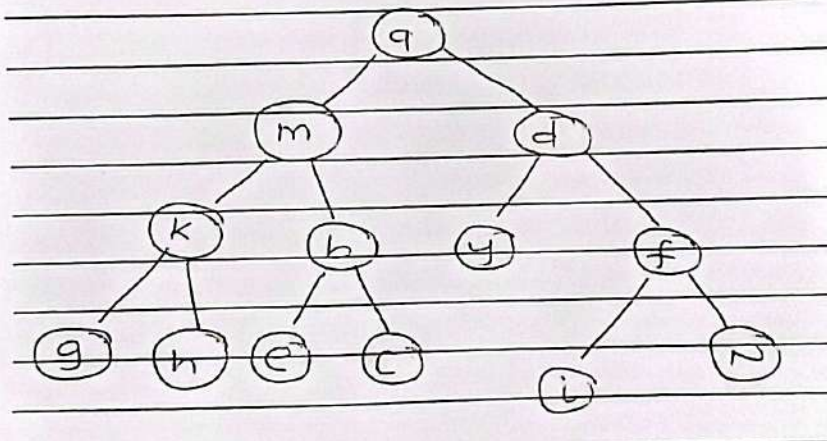
- a) Write an algorithm for recursive binary search. (8 marks)
- b) Explain the two basic operations that can be performed on a stack. (4 marks)
- c) Write an algorithm to delete an element from a linear queue. (8 marks)

QUESTION 4

- Write an algorithm to insert an element into a doubly-linked list at a given /position or node. (7 marks)
- Distinguish between static and dynamic implementation of lists. (8 marks)
- Create a binary search tree from the following items: 50, 75, 25, 12, 30, 60. (5 marks)

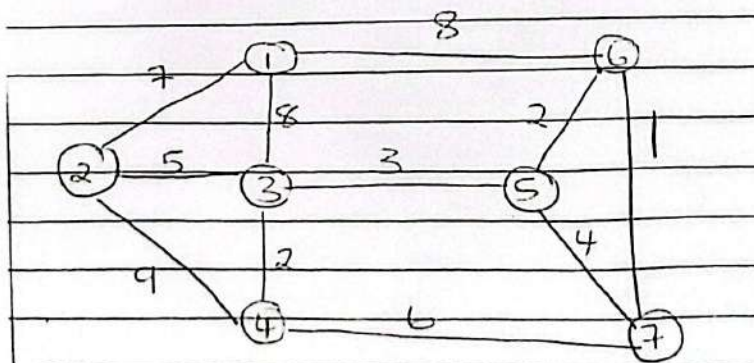
QUESTION 5

- Show steps to traverse the tree below using post-order traversal. (5 marks)



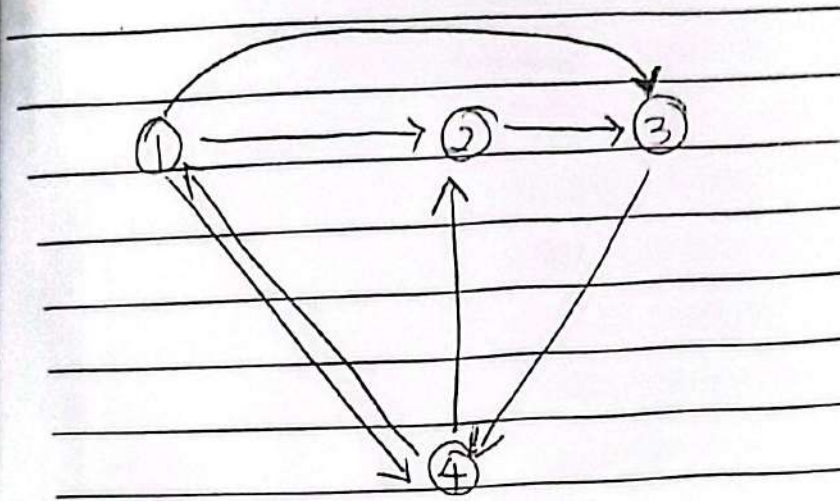
- Consider the graph below:

- Produce minimum spanning tree using Kruskal's algorithm. (5 marks)
- Determine shortest path using Dijkstra's algorithm. (5 marks)



Represent the following graph using adjacent matrix.

(5 marks)



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**NATIONAL DIPLOMA**

**IN**

**INFORMATION TECHNOLOGY**

**MODULE: Research and Project Management PAPER NO: 553/23/M10**

**DURATION: 3 Hours**

**JUNE 2026 EXAMINATION**

**REQUIREMENTS**

- 1) Answer booklet
- 2) Non programmable calculator
- 3) Graph paper
- 4) Formula booklet and statistical tables

**INSTRUCTIONS TO CANDIDATE**

- 1) Answer all questions.
- 2) Show all essential working.
- 3) If degree of accuracy is not specified in the question, give answer correct to 3 significant figures.

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*This paper consists of 3 printed pages.*

QUESTION 1

- a) A cyber security team has implemented a new intrusion detection system. Explain how they could evaluate its effectiveness from both a qualitative and quantitative perspective. (8 marks)
- b) Differentiate between descriptive and analytical research, providing one scenario where each type would be appropriate. (8 marks)
- c) Explain any two (2) objectives of research. (4 marks)

QUESTION 2

- a) The weight (in kgs) of 20 athletes are grouped into the following classes

|             |       |       |       |       |       |
|-------------|-------|-------|-------|-------|-------|
| Weight (kg) | 50-55 | 56-60 | 61-65 | 66-70 | 71-75 |
| frequency   | 3     | 7     | 5     | 3     | 2     |

- i) Draw a frequency polygon using the above data. (5 marks)
  - ii) Describe the distribution of weights. (2 marks)
- b) Imagine you are the project manager at the Ministry of ICT and you want to conduct a study to identify the IT skills gap among recent graduates. You want to survey graduates from both universities and polytechnics. Which sampling technique would be most appropriate? Provide an explanation for your choice. (5 marks)
- c)
  - i) Compare and contrast questionnaires and interviews as data collection methods. (6 marks)
  - ii) Explain how document analysis can be a valuable tool in research. (2 marks)

QUESTION 3

- a) In a large software development project, on average 3 out of every 5 code modules contain a minor bug. A random sample of 10 code modules is selected. Find the probability that:
  - i) Exactly 6 modules contain a minor bug. (2 marks)
  - ii) Less than 9 modules contain a minor bug. (4 marks)
- b) The size of data packets transmitted on a network can be modelled by a normal distribution with a mean of 25,8KB (kilobytes) and a standard deviation of 0.5kb. Determine the probability that a randomly selected data packet will have a size:

- i) Less than 25KB (3 marks)
- ii) Between 25.5KB and 26.5KB (4 marks)

c) A network administrator suspects that a recent software update has increased the average latency on the company's network. They want to conduct a hypothesis test to investigate this:

- i) Formulate the appropriate null and alternative hypothesis for this situation. (3 marks)
- ii) Explain what rejecting the null hypothesis would mean in this context. (4 marks)

#### QUESTION 4

a) Draw a network diagram and find the critical path for the project

| Activity | Preceding activity | Duration (days) |
|----------|--------------------|-----------------|
| A        |                    | 3               |
| B        | A                  | 5               |
| C        | A                  | 4               |
| D        | B                  | 6               |
| E        | B,C                | 7               |
| F        | D,E                | 4               |
|          |                    |                 |

(10 marks)

- b) Explain how a project manager can effectively communicate project status to stakeholders. (6 marks)
- c) Outline the concept of Net Present Value (NPV) in project evaluation. (4 marks)

#### QUESTION 5

- a) A local bank in Harare is developing a new mobile banking app targeting young adults. Explain the key factors that could affect the successful adoption and usage of this app, focusing on elements that drive innovation in mobile financial technology. (10 marks)
- b) Describe how to track project effort and cost. (4 marks)
- c) Explain any two (2) strategies for ensuring adherence to the project plan and maintaining project scope. (6 marks)

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**NATIONAL DIPLOMA**

**IN**

**INFORMATION TECHNOLOGY**

**SUBJECT: Database Administration (Theory) PAPER NO: 553/23/M04A**

**DURATION: 3 Hours**

**JUNE 2026 EXAMINATION**

**REQUIREMENTS**

**Answer booklet.**

**INSTRUCTIONS TO CANDIDATE**

**Answer all questions.**

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**SUBJECT: Database Administration (Theory) PAPER NO: 553/23/M04A**

**DURATION: 3 Hours**

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**INSTRUCTIONS TO CANDIDATE**

**Answer all questions.**

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QUESTION 1

- a) Discuss the hash file organisation method in details cite one advantage and one (1) disadvantage of this method. (6 marks)
- b) Outline any two (2) considerations for choosing a Database Management System. (4 marks)
- c) Normalisation

| StudNo | StudName | Course code  | Course length (Yrs) | Module code | Module name   | Lecturer |
|--------|----------|--------------|---------------------|-------------|---------------|----------|
| 001    | Kennedy  | 553/23/C0/M0 | 2                   | 553/23/M01  | H/W Admin     | Nzou     |
|        |          |              |                     | 553/23/M02  | N/W Admin     | Mavise   |
| 003    | Farai    | 317/22/C0/M0 | 1                   | 317/22/M02  | Programming   | Varaidzo |
|        |          |              |                     | 310/22/M06  | Communication | Chaka    |
|        |          |              |                     | 317/22/M05  | Comp Sec      | Midzi    |
| 007    | Tinashe  | 553/19/C0/0  | 3                   | 553/18/S01  | Comp Arch     | Taru     |
|        |          |              |                     | 553/18/S10  | Internet      | Farirai  |
| 010    | Margaret | 553/18/C0/0  | 3                   | 553/18/S13  | S.E           | Munhu    |
|        |          |              |                     | 553/18/S12  | Maths         | Chigubu  |

The table above shows the set of attributes found in a polytechnic database.

**NB:** A student attends one (1) course and can take any module during the course. A module can be taken as part of any course and is given by one particular lecturer.

Normalise the table showing the first, second and third normal forms. (10 marks)

QUESTION 2

- a) Describe the following database tests
  - i) Non- functional (4 marks)
  - ii) Functional (4 marks)
- b) Consider the scenarios below:
  - i) A SaleData table with columns SaleID, ProductID, RegionID

Write an SQL statement to find the total SaleAmount for each product in a region. (3 marks)

- ii) A StudentGrades table with columns StudentID, CourseID and Grade

Write an SQL statement to find students who have scored an 'A' in more than three courses. (4 marks)

QUESTION 3

- a) Explain database maintenance (4 marks)
- b) Outline the database maintenance tasks listed
- i) Backup and restore (3 marks)
  - ii) Update and patch (2 marks)
  - iii) Index and statistics (2 marks)
  - iv) Check and repair (2 marks)
  - v) Audit and security (3 marks)
- c) Describe any two (2) database security threats and their impact. (4 marks)

QUESTION 4

- a) Outline two (2) factors
- i) that affect choice of a backup medium. (4 marks)
  - ii) to consider when choosing an offsite backup location. (4 marks)
- b) Differentiate between backup RTO and RPO (4 marks)
- c) Explain two (2) causes for each of the following failures in a distributed database:
- i) Transaction failures (2 marks)
  - ii) System (site) failures (2 marks)
  - iii) Media failure (2 marks)
  - iv) Communication failure (2 marks)

QUESTION 5

- a) Consider a banking application where a customer transfers money from one account to another. The transaction involves two (2) main steps: deducting the amount from the sender's account and crediting it to the recipient's account.

Examine the transaction states in this scenario. (12 marks)

- b) Describe ACID properties of a transaction. (8 marks)

- c) Explain deadlock, starvation and livelock. (5 marks)

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**HIGHER EDUCATION EXAMINATIONS COUNCIL  
(HEXCO)**

**NATIONAL DIPLOMA**

**IN**

**INFORMATION TECHNOLOGY**

**MODULE: Network Administration**

**PAPER NO: 553/23/M02**

**DURATION: 3 hours**

**JUNE 2026 EXAMINATION**

**REQUIREMENTS**

**Answer booklet**

**INSTRUCTIONS TO CANDIDATE**

**Answer all questions.**

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*This paper consists of 3 printed pages.*

QUESTION 1

- a) Explain the importance of a site survey when planning a network. (5 marks)
- b) Discuss how environmental factors affect the design of a network. (6 marks)
- c) Understanding user requirements is critical when planning a network. Describe two (2) techniques that can be used for gathering these requirements. (8 marks)
- d) Starlink is a relatively new Internet Service Provider (ISP) in Zimbabwe. Their service is satellite based. Explain this technology as a means of accessing the internet. (5 marks)

QUESTION 2

- a) Outline any two (2) networking hardware devices. (6 marks)
- b) Enumerate the benefits of structured cabling when installing and configuring networks. (5 marks)
- c) Illustrate any two (2) symbols used in constructing network diagrams. (4 marks)

QUESTION 3

- a) Outline the steps that you would take to configure an IP address on a Windows 10 machine for connection to the internet. (8 marks)
- b) Describe the following routing protocols:
  - i) Link state
  - ii) Distance vector (6 marks)
- c) Discuss the uses of the following testing and monitoring tools in network administration.
  - i) Cable tester
  - ii) Multimeter (4 marks)

QUESTION 4

- a) Highlight the functions of any three (3) command line tools that can be used in network administration. (3 marks)
- b) The importance of network documentation cannot be overemphasized in Network Administration. Discuss the benefits of network documentation. (5 marks)
- c) Justify the need for network performance monitoring. (4 marks)
- d) Describe the following hardware/software security tools:
  - i) Firewall
  - ii) IDS
  - iii) VPN(9 marks)

QUESTION 5

- a) Troubleshooting a network should be structured and methodical. Outline the steps you would take to troubleshoot connectivity problems in a network. (10 marks)
- b) Explain the three (3) categories of maintenance that can be carried out as part of network maintenance. (12 marks)

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**MINISTRY OF HIGHER AND TERTIARY EDUCATION,  
INNOVATION, SCIENCE AND TECHNOLOGY  
DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL  
(HEXCO)**

**NATIONAL DIPLOMA**

**IN**

**INFORMATION TECHNOLOGY**

**MODULE: Hardware Administration      PAPER NO: 553/23/M01**

**DURATION: 3 Hours**

**JUNE 2026 EXAMINATION**

**REQUIREMENTS**

**Answer booklet.**

**INSTRUCTIONS TO CANDIDATE**

**Answer all questions.**

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*This paper consists of 3 printed pages.*

QUESTION 1

- a) (i) Outline any three (3) types of ESD tools. (3 marks)
- (ii) Explain any two (2) functions of ESD tools. (4 marks)
- (b) The college's computer equipment disposal policy aims to ensure the secure environmentally responsible and cost-effective disposal of irreparable hardware. State any three (3) approved disposal facilities in Zimbabwe. (3 marks)
- (c) Outline five (5) infrastructure setup strategies to implement real time monitoring at an airport. (10 marks)

QUESTION 2

You are an ICT technician at a leading electronics manufacturing company. Your team has assembled a new batch of motherboards for high performance gaming computers. Before transporting these motherboards to customers, you need to conduct performance tests to ensure they meet the required specifications.

- (a) (i) Identify any four (4) components to test and their configurations. (4 marks)
- (ii) Explain the test procedures for each component in (a) above. (8 marks)
- (iii) Outline any three (3) tools and equipment used for testing. (3 marks)
- (b) Identify five (5) tasks carried out in preventive hardware maintenance. (5 marks)

QUESTION 3

- (a) Outline any five (5) details found on a requisition form. (5 marks)
- (b) Explain any two (2) activities involved in each of the following steps of raising and submitting a requisition form in a college.
- (i) initiation
- (ii) approval
- (iii) procurement review
- (iv) quotation / tendering
- (v) purchase order generation (10 marks)
- (c) Outline any five challenges faced in Document Maintenance. (5 marks)

QUESTION 4

- (a) Explain five (5) different types of performance testing. (10 marks)
- (b) State five (5) performance testing tools. (5 marks)
- (c) Outline inventory exceptions which can be found in the inventory exception report. (5 marks)

QUESTION 5

Your company TechSolutions is a leading provider of software development and IT services. With 200 employees and offices in two locations you have a significant investment in hardware, software and data. A recent risk assessment identified potential threats from natural disasters cyberattacks and hardware failure.

- (a)
  - (i) Outline any five (5) key components of TechSolutions disaster recovery plan. (5 marks)
  - (ii) Explain how you would prioritise the recovery of critical systems and data. (5 marks)
  - (iii) Identify five (5) strategies you would implement for data backup and storage. (5 marks)
- (b) Outline five (5) benefits of updating inventory list periodically. (5 marks)

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**NATIONAL DIPLOMA**

**IN**

**INFORMATION TECHNOLOGY**

**MODULE: Network Administration**

**PAPER NO: 553/23/M02**

**DURATION: 3 hours**

**NOVEMBER/DECEMBER 2025 EXAMINATION**

**REQUIREMENTS**

**Answer booklet**

**INSTRUCTIONS TO CANDIDATE**

**Answer all questions.**

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*This paper consists of 3 printed page.*

QUESTION 1

- a) Outline any five (5) effects of environmental factors on network design. (10 marks)
- b) Explain the difference between star and mesh topologies, including one advantage and disadvantage of each. (6 marks)
- c) Explain the functions of the following networking devices:
- i) Content filter (2 marks)
  - ii) AAA/Radius server (2 marks)

QUESTION 2

A company has its headquarters in Harare where it hosts:

- A main public server for external users.
- An internal server for company employees.
- A demilitarized zone to isolate public and private network resources.

The company has three (3) branches that connect to the headquarters using a public infrastructure network.

Each branch requires:

- Security features to protect against cyber threats.
- VLANs for separating internal departments (e.g. Finance, HR and IT).
- Secure access to resources hosted on the main server at the headquarters.

- a) Draw a network diagram that properly represents how traffic should flow from the headquarters to the branches.

Ensure the diagram includes:

- Headquarters network setup (main server, internal server, DMZ)
- Connection from branches to headquarters through a secure public network.
- Security measures (Firewalls, VPN, VLANs) (10 marks)

- b) Explain any five (5) reasons why network hardware servicing is important. (10 marks)

QUESTION 3

- a) You are tasked to prepare a site based on a network diagram. Describe the activities involved in preparing this site. (10 marks)
- b) A network technician has completed a network installation for a new organisation. However, the organisation has a history of not documenting their network systems.

As the new network technician, outline five (5) positive impacts of documenting the network system. (10 marks)

QUESTION 4

- a) A company has its head office in Gweru and three (3) branches located in Mutare, Bulawayo and Beitbridge. The company wants to establish a network infrastructure to enable secure and efficient interconnectivity between these locations.

Suggest a routing protocol that can be used and justify your choice. (10 marks)

- b) Explain five (5) key reasons why it is essential for network administrators to carry out network monitoring. (10 marks)

QUESTION 5

- a) You are the network administrator at a certain company. How can you solve the following problems.
- i) Users experiencing slow internet speeds, slow file transfers and overall network lag. (2 marks)
  - ii) Devices experiencing weak or no wifi signal in certain areas. (2 marks)
  - iii) Users failing to connect to the network or the internet. (2 marks)
  - iv) Unauthorized access to the network. (2 marks)
  - v) Specific devices not connecting to the wifi network. (2 marks)
- b) Explain three (3) types of hardware maintenance, outlining the activities involved in each. (10 marks)

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**NATIONAL DIPLOMA**

**IN**

**INFORMATION TECHNOLOGY**

**MODULE: Database Administration (Theory) PAPER NO: 553/23/M04A**

**DURATION: 3 Hours**

**NOVEMBER/DECEMBER 2025 EXAMINATION**

**REQUIREMENTS**

**Answer booklet**

**INSTRUCTIONS TO CANDIDATE**

**Answer all questions**

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*This paper consists of 3 printed pages.*

QUESTION 1

Universal Suppliers prides itself on having up to date information on the processing and current location of each shipped item. To do this, Universal Suppliers relies on a company wide information system. Shipped items are the focus of Universal Supplier's product tracking information system.

Shipped items can be characterised by item number (unique), weight, dimensions, insurance amount, destination and final delivery date. Shipped item (s) are received into Universal Suppliers at a single retail centre. Retail centres are characterised by their type, unique \_ID and address. Shipped items make their way to their destination via one or more standard Universal Suppliers' transportation events (i.e flights, truck deliveries). These transportation events are characterised by a unique schedule number, a type (e.g flight, truck) and a delivery\_route

- a) Given the scenario above, create an ERD that captures the information about the Universal Suppliers system. (10 marks)
- b) Define the following terms:
  - i) Conceptual data model (2 marks)
  - ii) Normalisation (2 marks)
  - iii) Cardinality (2 marks)
- c) Explain the file access method for the following file organisation techniques:
  - i) Heap (2 marks)
  - ii) Sequential (2 marks)

QUESTION 2

- a) Describe the circumstances that would lead to the following tests to be carried out:
  - i) Regression testing (4 marks)
  - ii) System testing (3 marks)
  - iii) Integration testing (3 marks)

Illustrate the structure of a well-formed transaction. (10 marks)

### QUESTION 3

Discuss five (5) trade-offs of online remote support versus onsite support. (10 marks)

Explain any five (5) phases of the data migration process. (10 marks)

### QUESTION 4

a) Discuss the following types of database backup:

- i) Tri-weekly (5 marks)
- ii) Adhoc (5 marks)
- iii) Scheduled (5 marks)

b) Explain the importance of RAID technology in ensuring data availability. (5 marks)

### QUESTION 5

a) A transaction can take any of five states. In an online banking system, any of the five (5) states can take place during a bank transfer.

Given the scenario above explain each transaction state. (15 marks)

b) Given the scenario below, illustrate the concept of lost update in transaction processing

Account A has a balance of \$1000 and Account B has a balance of \$500. Transaction 1 (T1) initiates a transfer of \$200 from account A to B and at the same time Transaction 2 (T2) also initiates a transfer of \$300 from Account A to B. (5 marks)

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**IN**

**INFORMATION TECHNOLOGY**

**MODULE: Object Oriented Programming Theory      PAPER NO: 553/23/M05A**

**DURATION: 3 hours**

**NOVEMBER/DECEMBER 2025 EXAMINATION**

**REQUIREMENTS**

**Answer booklets**

**INSTRUCTIONS TO CANDIDATE**

**Answer all questions.**

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*This paper consists of 4 printed page.*

### QUESTION 1

a) Explain the meaning of the following terms as used in C#.

- i) Event-driven program (2 marks)
- ii) Function overloading (2 marks)
- iii) Encapsulation (2 marks)
- iv) Structure (2 marks)
- v) Invoke functions (2 marks)

b) Outline any three (3) applications of C#. (3 marks)

c) using System; // Line 1 (2 marks)  
// Line 2 (2 marks)

```

Namespace HelloWorld // Line 3
{ // Line 4
 class Program // Line 5
 {
 static void Main (string [] args)
 {
 Console.WriteLine ("Hello World");
 }
 }
}

```

Using the program above explain the meaning of the lines commented in the program.

### QUESTION 2

a) Complete the following table:

|      | MODIFIER  | DESCRIPTION |           |
|------|-----------|-------------|-----------|
| i)   | Public    |             | (2 marks) |
| ii)  | Private   |             | (2 marks) |
| iii) | Protected |             | (2 marks) |
| iv)  | Internal  |             | (2 marks) |

b) Outline the differences between a derived class (child) and the base class (parent). (2 marks)

c) Outline any two (2) disadvantages of using IDEs. (4 marks)

QUESTION 3

- a) The syntax below is showing how to declare a delegate in C#.

```
[modifier] delegate [return_type]
[delegate_name] ([parameter_list]);
```

Explain the function of each item in the declaration:

- |                   |           |
|-------------------|-----------|
| i) Modifier       | (2 marks) |
| ii) Delegate      | (2 marks) |
| iii) Return_type  | (2 marks) |
| iv) Delegate_name | (2 marks) |
| v) Parameter_list | (2 marks) |

- b) Outline the differences between each of the following terms:

- |                                       |           |
|---------------------------------------|-----------|
| i) User interface and user experience | (2 marks) |
| ii) Exceptions and errors in C#       | (2 marks) |
| iii) Data binding and data validation | (2 marks) |

- c) Highlight the steps to follow when creating a new windows forms in (WinForms) visual studio. (10 marks)

QUESTION 4

- a) Outline the importance of each of the following:

- |                                   |           |
|-----------------------------------|-----------|
| i) Exception handling             | (2 marks) |
| ii) Program constructs            | (2 marks) |
| iii) Iteration                    | (2 marks) |
| iv) Modularisation in programming | (2 marks) |

- b) Using a suitable syntax for each, describe the following:

- |                         |           |
|-------------------------|-----------|
| i) Single selection     | (3 marks) |
| ii) Double selection    | (3 marks) |
| iii) Multiple selection | (3 marks) |
| iv) Nested selection    | (3 marks) |

QUESTION 5

- a)
  - i) Show the syntax of declaring and initializing a two dimensional array in C#. (2 marks)
  - ii) Using some code snippets, show the difference between sorting and searching in arrays. (7 marks)
- b) Define a file stream. (2 marks)
- c) Outline the steps to follow when using Dataset to process database records. (6 marks)

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**NATIONAL DIPLOMA**

**IN**

**INFORMATION TECHNOLOGY**

**MODULE: Hardware Administration**

**PAPER NO: 553/23/M01**

**DURATION: 3 Hours**

**NOVEMBER / DECEMBER 2025 EXAMINATION**

**REQUIREMENTS**

**Answer booklet**

**INSTRUCTIONS TO CANDIDATE**

**Answer all questions.**

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***This paper consists of 3 printed pages.***

QUESTION 1

- a) Describe the role of the data bus and address bus in a microprocessor. (4 marks)
- b) Assess the effectiveness of any three (3) different diagnostic tools in identifying hardware failures. (6 marks)
- c) Outline the steps to assemble a desktop. (10 marks)

QUESTION 2

- a) Outline the key steps involved in conducting performance tests on assembled hardware. (5 marks)
- b) Explain any five (5) importances of enforcing Electrostatic Discharge (ESD) precautions in a hardware maintenance environment. (10 marks)
- c) Outline five (5) key components of a hardware requisition form. (5 marks)

QUESTION 3

- a) Analyse the impact of three (3) total cost of ownership factors on hardware. (6 marks)
- b) Describe the procedure for raising and submitting a requisition. (4 marks)
- c) Explain five (5) reasons why thorough site preparation is crucial before installing hardware. (10 marks)

QUESTION 4

- a) Tasked with upgrading a desktop computer's memory, installing 16GB of new RAM into a system that already has 8GB installed, outline the steps involved in installing and configuring the computer memory. (6 marks)
- b) Assess the benefits of any five (5) preventive hardware maintenance practices in reducing downtime. (10 marks)
- c) Discuss any two (2) hardware access control best practices that prevent unauthorised physical access to sensitive equipment. (4 marks)

QUESTION 5

- a) Assess the vulnerabilities of a computer system's hardware and identify any five (5) threats to its security. For each threat propose a feasible solution to mitigate the risk. (10 marks)
- b) Analyse the role of hardware inventory in maintaining computer security and explain any three (3) purposes it serves. (6 marks)
- c) Distinguish between an inventory status report and an inventory exception report. (4 marks)

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**NATIONAL DIPLOMA**

**IN**

**INFORMATION TECHNOLOGY**

**SUBJECT: Software Engineering**

**PAPER NO: 553/23/M03**

**DURATION: 3 Hours**

**NOVEMBER/ DECEMBER 2025 EXAMINATION**

**REQUIREMENTS**

**Answer Booklet**

**INSTRUCTIONS TO CANDIDATE**

**Answer all questions.**

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*This paper consists of 3 printed pages.*

QUESTION 1

- a) Outline any three (3) benefits of using software engineering practices in developing systems. (3 marks)
- b) Your college is having challenges in clearing students for result collection for progression to the next level/semester. As an IT manager you are supposed to draw up a problem statement that will justify the development of a new system.  
(NB: Include objectives of the proposed system). (5 marks)
- c) Produce a Software Requirement Specification (SRS) document for the proposed system in (b). (12 marks)

QUESTION 2

- a) Discuss the pros and cons of CASE tools in software engineering. (10 marks)
- b) A University Library Information System  
  
Scenario: A university library needs a system to manage its collection of books, journals and other materials, as well as track user borrowing and returns. The system should also provide features for searching the catalogue, reserving items and generating reports.
  - i) From the information above identify any three (3) entities and their attributes. (6 marks)
  - ii) From the given scenario, draw up any two (2) relationships that may exist among the entities. (4 marks)

QUESTION 3

- a) Explain any four (4) benefits of modularity in software design. (8 marks)
- b) Explain horizontal integration. (2 marks)
- c) Tanah Loan Investment has been hacked. The management of the company has decided to immediately carry out system maintenance. Describe any two (2) types of system maintenance that are very important to Tanah Investment at the moment. (10 marks)

QUESTION 4

- a) Explain, giving examples, validation and verification testing. (6 marks)
- b) Explain any three (3) reasons that justify the need for software updates. (6 marks)
- c) MMP Group of Companies has developed a new state-of-the-art system to address several internal and external issues they have been experiencing in the old system. The system is to be deployed in a week's time. As a Systems Engineer, outline any four (4) measures that you are going to implement to reduce resistance to change, during deployment. (8 marks)

QUESTION 5

- a) Describe the following Project Management tools:
- i) WBS (4 marks)
  - ii) PERT Chart (3 marks)
  - iii) Gantt Chart (3 marks)
- b) Mumvee Laboratories Pvt Ltd launched a new system across its branches. However they are concerned with risks associated with the system. Describe any three (3) types of risks that they can suffer. (10 marks)

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