



**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY FACULTY OF**

**FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION**

**DEPARTMENT OF SCIENCE, MATHEMATICS AND TECHNOLOGY EDUCATION**

**PST 6378 EVOLUTIONARY COMPUTING AND PARALLEL DISTRIBUTED PROCESSING**

**Examination  
December 2024**

**This Examination Paper consists of 3 pages**

Time Allowed: 3 hours

Total Marks: 100

Internal Examiner: A. Mangena

External Examiner: Dr B Moyo

**INSTRUCTIONS**

1. Answer any four questions.
2. Each question carries 25 marks. Total Marks are 100 .

**ADDITIONAL MATERIALS NEEDED**

1. None

**MARK ALLOCATION**

| QUESTION     | MARKS      |
|--------------|------------|
| 1.           | 25         |
| 2.           | 25         |
| 3.           | 25         |
| 4.           | 25         |
| 5.           | 25         |
| <b>TOTAL</b> | <b>100</b> |

### **Question One**

- i) Explain the link Evolutionary Computing and Charles Darwin ideology of natural selection. [10 marks]
- ii) Compare and contrast Machine learning with the way students learn in schools. [15 marks]

### **Question Two**

- i) Discuss how parallel computing can be of benefit in an organization? [15 marks]
- ii) Explain how the concepts of algorithms in computer science are extended in evolutionary computing. [10 marks]

### **Question Three**

- a) Discuss the role of biology in evolutionary algorithms [15 Marks]
- b) Explain how you can use evolutionary algorithms in education. [10 Marks]

### **Question Four**

- I. Evaluate the concept of fuzzy logic. [15 Marks]
- II. Discuss any 5 key components of Artificial Neural Networks [10 Marks]

### **Question Five**

Discuss the following contributions by Alan Turing

- a) The Turing Test [10 Marks]
- b) The bombe [10 Marks]
- c) The Turing Award [5 Marks]

~End of Examination~