



**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**FACULTY OF ENGINEERING**

**DEPARTMENT OF INDUSTRIAL AND MANUFACTURING ENGINEERING**

**Master of Engineering Degree Manufacturing Engineering/Systems and Operations Management**

**MANAGEMENT OF TECHNOLOGY**

**TIE 6231**

**Stage II Main Examination Paper**

**February/March 2025**

This examination paper consists of 3 printed pages.

**Time Allowed: 3 hours**

**Total Marks: 100**

**Special Requirements: None**

**Examiner's Name: Dr L. Mugwagwa & Dr VM. Sibanda**

**INSTRUCTIONS AND INFORMATION TO THE CANDIDATE**

1. The question paper contains six (6) questions.
2. **Answer a total of four (4) questions, any two (2) from each section.**
3. Each question carries 25 marks.

**SECTION A: ANSWER ANY TWO (2) QUESTIONS FROM THIS SECTION**

**Question 1**

- (a) Discuss key attributes that qualify an invention for patenting. [10]
- (b) Discuss the benefits and challenges of obtaining a patent. [10]
- (c) Why should an organisation conduct an intellectual property (IP) audit? [5]

**Question 2**

- (a) Discuss the technology transfer model. [10]
- (b) Differentiate between an innovation and an invention, giving examples. [5]
- (c) With the aid of a diagram, explain the cyclical Innovation Process model. [5]
- (d) Discuss the importance of a research and innovation strategy in an organisation. [5]

**Question 3**

- (a) One of the major causes of environmental problems is technology and how humans use it, giving examples, explain this. [12]
- (b) Discuss how the development of technology is:
  - i. Dynamic? [3]
  - ii. Systematic [3]
  - iii. Cumulative [3]
- (c) How does technology affect economic growth? [4]

**SECTION B: ANSWER ANY TWO (2) QUESTIONS FROM THIS SECTION**

**Question 4**

- (a) Identify and discuss four (4) key components of talent management. [12]
- (b) Why is talent management important to organisations? [8]
- (c) Explain the link between knowledge management and productivity. [5]

**Question 5**

- (a) What circumstances would influence an organisation to undergo change? [8]
- (b) Explain the 7Rs of change management. [7]
- (c) Discuss the main challenges local organisations face in transforming themselves in the face of Artificial Intelligence and various technological changes in order to remain competitive. [10]

**Question 6**

- (a) Discuss the importance of technology management in an organisation. [10]
- (b) Give an overview of the importance of research and development (R&D) infrastructure in Driving Technological Innovation. [5]
- (c) Give an account of 5 pivotal technologies for industrial development. [10]

**End of examination paper.**