FACULTY OF ENGINEERING AND ENVIRONMENT

DEPARTMENT OF METALLURGICAL ENGINEERING

DEPARTMENT OF MINING ENGINEERING

WORKSHOP PRACTICE

EMN/EMG 1206

Final Examination Paper

April 2024

This examination paper consists of 2 pages

Time Allowed: **3 hours**

Total Marks: **100**

Examiner's Name: **Eng. M. Kanganga**

INSTRUCTIONS

1. This question paper consists of 5 questions. Answer any four.
2. Questions 1 to 5 carry 25 marks each
3. Answer each question on a new page and write as eligible as possible

Additional Requirements

Calculator

Question 1

a) Explain the process by which a hazard if uncontrolled can become an accident. [10]
b) Describe the hierarchy of hazard control and explain why the elimination of hazards is the most effective control measure and the use of personal protective equipment is the least effective control measure. [15]

Question 2

a) Discuss the principles, techniques, and safety measures associated with Shielded Metal Arc Welding (SMAW) in the context of workshop technology. Your answer should cover key aspects such as equipment setup, electrode selection, welding positions, and precautions to prevent common welding defects. Provide detailed explanations supported by relevant diagrams or illustrations where necessary. [15]
b) Evaluate the importance of proper ventilation and protective gear in ensuring a safe working environment during SMAW operations. [10]

Question 3

a) Explain how systematic errors differ from random errors. [10]
b) Differentiate between repeatability and reliability. [8]
c) Describe the working mechanism behind a Go/ No-Go gage. [7]

Question 4

a) Briefly explain what is meant by metal casting and why it is important in engineering. [10]
b) Give three (3) reasons for Gating in casting processes. [3]
c) What are sprues, runners and gates in casting? [3]
d) Give a brief overview of sand casting. . [9]

Question 5

a) There are five common maintenance approaches that can be applied to mine assets but the common three are reactive, preventative and predictive. Giving examples, explain how each method can be beneficial in use and also explain some of the limitations of each method. [25]