NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF ENGINEERING

DEPARTMENT OF INDUSTRIAL AND MANUFACTURING ENGINEERING

Bachelor of Engineering (Hons) Degree Industrial and Manufacturing Engineering

PROFESSIONAL ENGINEERING AND COMMUNICATION

EIE 1106

FIRST SEMESTER MAIN EXAMINATION

December 2024

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

Time Allowed: **3 HOURS**

Total Marks: **100**

Examiner's Name: **ENG MUNYAU**

INSTRUCTIONS AND INFORMATION TO CANDIDATE

1. Answer any FIVE **(5)** Questions.
2. Each Question carries a total of 20 Marks.
3. Start the answer to each full question on a fresh page.

QUESTION 1

Explain the following styles of communication, stating the advantages and disadvantages and provide examples of where they can be applied:

a) Downward communication [5]
b) Upward communication [5]
c) Lateral communication [5]
d) Diagonal communication [5]

QUESTION 2

a) Describe benefits of possessing strong communication skills as an Engineering Manager. [10]
b) You are the head of the Production Department at your organization. Your time has been tasked with designing a new recyclable and cost-effective plastic. Outline how you would facilitate a group discussion with your team to develop the best product. [10]

QUESTION 3

a) Write a formal application letter for the position of Engineering Manager, as advertised in a newspaper. Ensure that your letter includes all necessary details, such as your qualifications, experience, and reasons for applying. [8]
b) Create a comprehensive Curriculum Vitae (CV) that highlights your engineering qualifications, work experience, skills, and achievements. Assume that this CV will be attached to the application letter for the Engineering Manager position. [12]

QUESTION 4

a) Distinguish between Oral and Written communication making use of the following attributes: [12]
   I. Speed;
   II. Record;
   III. Precision and Accuracy;
   IV. Support;
   V. Length, and
   VI. Expense.
b) Explain how oral and written communication methods complement each other in a business or engineering setting. Provide examples to illustrate your points. [8]

QUESTION 5

The Engineering Council of Zimbabwe is a multi-disciplinary Institution covering all aspects of engineering in Zimbabwe. Its operation and membership are regulated by an Act of Parliament.

a) Explain the roles of Engineering Council of Zimbabwe. [10]
b) Explain the benefits of being affiliated to a professional body. [10]

QUESTION 6

A construction company is building a new high-rise building, and you are the site engineer responsible for ensuring the safety of workers and visitors. Explain how you would communicate the following safety information to the workers and visitors:

1. Warning of a potential fall hazard from the 10th floor.

2. Location of emergency exits and fire extinguishers.

3. Importance of wearing personal protective equipment (PPE).

In your explanation, describe the methods you would use to communicate this information, including the types of signs, symbols, and visual aids you would employ. [20]

QUESTION 7

a) Read the passage below and answer the following questions

One great disaster among engineering designs is the well-known story of the sinking of the Titanic. The amazing thing about the story of the Titanic is the fact that this ship was actually built to be invincible. At the time it was built, 1909, it was designed to go up against its big competitor ship-making-companies. The Titanic was by far was the biggest ship ever built, stretching 900 feet in length. The ship was meant to carry a massive amount of people on it across the Atlantic Ocean. A horrible accident lead to the sinking of The Titanic in 1912 while it was on its maiden voyage across the Atlantic. Since its sinking and killing thousands on board, there has been a lot of controversy on what really caused it to sink. All that is really confirmed for sure is that the ship was sailed into a tip of an iceberg that ripped a hole in it eventually sinking from water overfill. There have been many theories carefully made up and I'm going to explain and give some examples of how engineering ethics fit with this disaster and what could have been different in preventing this tragedy.

The first idea was that the captain carelessly drove the ship with too high of speeds while it went through and hit the iceberg. Since the ship was supposedly indestructible this was obviously a plausible reason. As years went by and a diver was curious and dove down to find the ship and took samples back up, more questions arose. Another theory came up that it was the metal that was used to construct the ship was too weak for the terrain of the ocean. The last theory was that the bolts that held together the steel slabs that made up the Titanic were too short causing the steel to tear apart easier than what it should've.

a) Analyze the engineering ethics surrounding the Titanic disaster, considering the various theories on its sinking. Discuss the ethical implications of the incident and propose measures that could have prevented or mitigated the tragedy [20]