

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF INDUSTRIAL TECHNOLOGY

DEPARTMENT OF INDUSTRIAL & MANUFACTURING ENGINEERING

**Workshop Technology 1 - TIE 1103**

**SUPPLEMENTARY EXAMINATION OCTOBER 2009**

**Instructions to Candidates**

**Time Allowed :** 3 hours

1. Answer Five Questions only
2. All questions carry 20 marks each

**QUESTION 1**

List any five items of safety equipment to be found in an engineering workshop and related to

- a) electrical work
  - b) clothing
  - c) grinding
  - d) machine guards
  - e) arc welding
- [5]

Briefly explain how each one of the above safety equipment are used. [15]

**QUESTION 2**

Communication is a vital aspect of safety in a working engineering environment. Identify and list any five items of safety communication and explain what these mean and where they would be used. [20]

**QUESTION 3**

I Explain the meaning of the following measuring/measurement terms.

- a) Precision [2]
- b) accuracy [2]
- c) Reliability [2]
- d) Repeatability [2]

II Give two examples each to show their importance in engineering operations [12]

#### **QUESTION 4**

Use simple sketches to show four (4) ways how a datum can be used to depict a source of reference. [20]

#### **QUESTION 5**

A vernier instrument has a fixed scale graduated at 1mm intervals, and a moving scale of 20 intervals over a distance of 19mm

- I Calculate the accuracy of reading. [10]
- II Make sketches to show how the moving scale could be graduated
  - a) for direct reading [5]
  - b) such that the reading is obtained from the graduation number x accuracy of reading. [5]

#### **QUESTION 6**

Explain clearly the meanings of the following mechanical properties

- I giving one example of an engineering material
  - a) hardness [2]
  - b) toughness [2]
  - c) ductility [2]
  - d) elasticity [2]
  - e) thermal conductivity [2]
- II Briefly describe 2 examples each of typical engineering applications for the above five properties [10]

**END OF EXAM**