TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING

DIPLOMA IN MECHANICAL ENGINEERING

EME 2103
WORKSHOP TECHNOLOGY & PRACTICE II

END OF SEMESTER EXAMINATIONS

YEAR 1 SEMESTER 2

SERIES: DECEMBER, 2013

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. You should have the following for this examination:
   - Answer Booklet
   - Drawing Instruments
   - Scientific Calculator

2. This paper consists of **FIVE** Questions.
3. Answer **ANY THREE** Questions.
4. All Questions carry equal marks.
4. **This paper consists of *THREE* printed pages.**

Question ONE

(a) (i) Describe the term Grinding and state **FOUR** important purposes for grinding metals.

(ii) Explain any **FOUR** important advantages grinding operation possesses over other machining operations.

(10 marks)

(b) (i) Using illustrations describe the "Grit material" and state the **TWO** kinds of abrasive in common use.

(ii) Differentiate clearly between "wheel loading" and wheel glazing.

(iii) State and describe any **TWO** types of wheel dresser commonly used to dress and true grinding wheels.

(10 marks)

Question TWO

(a) (i) Differentiate between the **THREE** fundamental types of chips produced when metal cutting, use suitable sketches.

(ii) Explain the importance of the following tool angles:

(I) Front clearance
(II) Tool angle
(III) Top rake

(12 marks)

(b) (i) Differentiate between "cutting speeds" and "Feed" in reference to machining operations.

(ii) State and explain any **FOUR** factors upon which any **ONE** of the above conditions in (bi) above depends upon.

(8 marks)

Question THREE

(a) (i) Define turning and state any **FOUR** types of lathe machines.

(ii) Using a neat labeled diagram explain any **FOUR** main parts of a centre lathe.

(10 marks)

(b) (i) Give any **FOUR** methods of work holding during turning and explain **TWO** factors that determines the method selected.

(ii) State **FOUR** tool forms commonly used for turning.

(iii) State any **FOUR** materials from which lathe tools are made from.

(iv) Explain any **FOUR** reasons for using cutting solutions and lubricants.

(10 marks)

Question FOUR

(a) (i) Describe the shaping machine and explain its operation.

(ii) Explain how a flat level surface can be produced on a shaping machining, stating the movement action of both the tool and work.

(10 marks)

(b) (i) Explain why milling machines are referred to as extremely versatile machines.

(ii) Differentiate clearly between any **TWO** types of milling machines.

(iii) State any **FOUR** milling cutters (iv) explain any **TWO** safety requirements to be observed during milling operations.

(10 marks)

Question FIVE

(a) (i) Describe the purpose of heat treatment of materials, especially steels.

(ii) Describe the following treatment processes:

(I) Hardening
(II) Normalizing
(III) Tempering
(IV) Annealing

(10 marks)

(b) (i) Differentiate clearly between "cold" working and "Hot" working.

(ii) Define casting and state **TWO** common furnances used for casting operations.

(iii) Define fusion welding and explain any **TWO** common fusion joining processes.

(10 marks)