TECHNICAL UNIVERSITY OF MOMBASA

DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATION

FOR

DIPLOMA IN MECHANICAL ENGINEERING

EME 2103: WORKSHOP TECHNOLOGY AND PRACTICE

END OF SEMESTER EXAMINATION

SERIES: APRIL

TIME: 2HOURS

DATE: APRIL 2016

Instructions to candidates

You should have the following for this examination

- **Answer booklet, examination pass and student ID**
- **This paper consist of five questions**
- **Attempt any three questions**
- **All questions carry equal marks**
- **Do not write on the question paper.**

QUESTION ONE

a) i. Cleary describe the grinding operation and state any four purposes of metal grinding. **(6 marks)**

ii. Differentiate between the two types of hand grinders. **(10marks)**

b) i. State and discuss the two main types of abrasive particles or the grits and one

example of each.

ii. Define "dressing" and give any two common dressing tools. **(7marks)**

c) State any four aids to correct grinding and explain the theory of metal cutting. **(3marks)**

QUESTION TWO

a) i. State any Four commonly used cutting tool materials.

ii. Discuss the three main common properties that a suitable tool must possess for effective cutting**.** **(5marks)**

b) i. Differentiate clearly between the three fundamental types of clips produced when metal cutting.

ii. With the aid of illustration describe the two important tool angles for effective cutting. **(5marks)**

iii. State any four factors that govern the tools shapes and tool angle profiles. **(10marks)**

c) i. Define "cutting" speed and "feed"

ii. State any three types or cutting fluids. **(5marks)**

QUESTION THREE

a) i. Describe the term lathe machine and sate two most important lathe capacities

ii. State and describe any three types of lathe machines in common use. **(10marks)**

b) i. With the aid of a suitable neat sketch outline any six main parts of a lathe machine.

ii. State any four lathe accessories and discuss any two methods of holding workpieces on the lathe machine. **(10marks)**

QUESTION FOUR

a) i. Describe the principle operation of the shaping machine and state four advantages of the shaping machine. (**4marks)**

ii. State one very important requirement of shapes cutting tools and give four common shaping tool profiles using illustrations. **(3marks**)

iii. With the aid of a labeled sketch illustrate the driving mechanism for the shaping machine. **(3marks)**

b) Describe the milling machine and any two types of milling machines. **(3marks)**

c) With the aid of neat sketches explain the two possible methods of horizontal milling.

QUESTION FIVE

a) i. Explain what is meant by the term heat treatment and describe any three common heat treatment process done to steels.

ii. Differentiate between cold and hot working process. **(10marks)**

b) i. Define metal casting and discuss two equipment's employed for melting the metal for casting.

ii. State any four moulding tools and equipment's **(6marks)**

c) Differentiate between gas welding and Arc welding. **(4marks)**