



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 chips 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 state 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)**