TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING

DIPLOMA IN AUTOMOTIVE ENGINEERING (DAE)
DIPLOMA IN PLANT ENGINEERING (DMPL)
DIPLOMA IN PRODUCTION ENGINEERING (DMPR)
DIPLOMA IN CHEMICAL ENGINEERING (DCE)

EME 2105

WORKSHOP TECHNOLOGY & PRACTICE II

SPECIAL/SUPPLEMENTARY EXAMINATIONS

YEAR 1 SEMESTER II

SERIES: MARCH, 2014

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. You should have the following for this examination:
   - Answer booklet
   - Drawing Instruments

2. This paper consists of **FIVE** Questions.
3. Answer **ANY THREE** Questions.

This paper consists of FOUR printed pages.

Question ONE

(a) (i) Describe the term Grinding and state any **FOUR** purpose of Grinding.

(ii) Discuss any **FOUR** advantages of grinding over other cutting processes for production work.

(10 marks)

(b) Describe the following grinding wheel defects stating their causes and remedies:

(i) Wheel glazing
(ii) Wheel loading

(8 marks)

(c) Describe the term "Abrasives" and state any **TWO** types of Abrasive particles used for grinding wheels. **(10 marks)**

Question TWO

(a) (i) Differentiate clearly between the **THREE** fundamental types of chips produced when metal cutting.

(ii) With the aid of suitable sketches describe the following tool angles:

(I) The clearance angle
(II) Rake angle

(10 marks)

(b) (i) State any **THREE** methods used to avoid a built-up edge.

(ii) Explain the effects of the following cutting parameters:

(I) Cutting speeds
(II) Feed rate
(III) Cutting power

(6 marks)

(c) (i) With the aid of sketches explain the procedure of grinding cutting tools. Illustrate the effect of the rake angle on the strength of the tool point.

(ii) State any **TWO** types of Abrasives.

(4 marks)

Question THREE

(a) (i) Describe the term "centre lathe".

(ii) State any **FOUR** possible operations carried on a centre lathes.

(iii) With the aid of a suitable sketch explain any **FOUR** main parts of a lathe.

(12marks)

(b) (i) With the aid of suitable sketches illustrate any **TWO** common lathe accessories.

(ii) Describe using suitable sketches any **TWO** methods of work holding on the centre lathe.

(8 marks)

Question FOUR

(a) Describe the purpose of using the shaping machine and state any **THREE** reasons why it is preferred as a machine operation instead of milling machine. **(4 marks)**

(b) With the aid of a suitable sketch label and explain any **FOUR** main parts of a shaping machine.

(10 marks)

(c) (i) Describe any **TWO** methods of work holding during a shaping operation.

(ii) State any **TWO** safety precautions to be observed when using the shaping machines.

(iii) Explain any **TWO** methods of testing the accuracy of the shaper before setting it up.

(6 marks)

Question FIVE

(a) (i) State **TWO** advantages of a milling machine over other cutting machines.

(ii) State any **THREE** types of milling machines and any **THREE** types of milling cutters.

(6 marks)

(b) (i) Differentiate between cold and hot working processes:

(ii) State any **THREE** functions of coolants.

(iii) Define the following terms used in Heat treatment processes:

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

(6 marks)

(c) (i) Describe the term "Fusion Welding" and give any **TWO** types of fusion joining processes.

(ii) With the aid of suitable sketches describe the **THREE** main types of oxy-acetylene flames.

(4 marks)

(iii) With the aid of a suitable sketch illustrate arc welding process.

(6 marks)