



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

**BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING**

**EMG 2202: WORKSHOP PROCESSES & PRACTICE II**

**END OF SEMESTER EXAMINATION**

**SERIES: DECEMBER 2016**

**TIME: 2 HOURS**

**DATE: Pick Date DECEMBER 2016**

## Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions.

**question ONE (Compulsory) and any other TWO questions.**

**Do not write on the question paper.**

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## **Question ONE**

- Sketch a centre lathe showing its major parts and write short note (10 marks)
- Make short notes on THREE types of drill machines (10 marks)
- List the advantages and disadvantages of shapers. (10 marks).

## **Question TWO**

- List five centre lathe accessories (5 marks)
- List five difference between the turret lathe and centre lathe (5 marks)
- A workpiece of 320 mm diameter and 750 mm length is to be turned down to 290 mm for the entire length. The suggested feed is 1.5 mm/revolution and the cutting speed is 170 m/min. The maximum allowable depth of cut is 6mm. Neglect tool overtravel and tool approach. Calculate :
  - Spindle speed (2 marks)
  - Feed speed (2 marks)
  - Material removal rate (2 marks)
  - Cutting time (4 marks).

### Question THREE

- a) Write short notes on the classification of shapers according to the position and travel of the ram (10 marks)
- b) A cast iron plate measuring  $600 \times 200 \times 80 \text{ mm}$  is to be rough shaped along its wider face. Calculate the machining time taking *cutting speed* =  $10\text{m/min}$  , *return speed* =  $15\text{m/min}$ . *approach* =  $30 \text{ mm}$ , *over travel* =  $30 \text{ mm}$ , *allowance on either side of the plate width* =  $6 \text{ mm}$  and *feed per cycle* =  $1.5 \text{ mm}$  ( 10 marks)

### Question FOUR

- a) Write short notes on the following drilling operations;
  - i. Reaming (5 marks)
  - ii. Boring (5 marks)
  
- b) A hole of  $35 \text{ mm}$  diameter and  $80 \text{ mm}$  depth is to be drilled. The suggested feed is  $1.6 \text{ mm/rev}$  and the cutting speed is  $62\text{m/min}$ . Assuming tool approach and tool overtravel as  $6 \text{ mm}$ . Calculate
  - i. Spindle speed (2 marks)
  - ii. Feed speed ( 2marks)
  - iii. Cutting time (3 marks)
  - iv. Material removal rate (3 marks)

### Question FIVE

- a) List FIVE factors which affects metal cutting. (5 marks)
- b) Write short notes on continuous chips and built up chip .(5 marks).
- c) Draw a single point cutting tool showing the main angle. Give a brief description of each angle ( 10 marks)