

# TECHNICAL UNIVERSITY OF MOMBASA Faculty of Engineering & Technology

## DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

# UNIVERSITY EXAMINATIONS FOR DEGREE IN BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

## EMG 2202: WORKSHOP II

## END OF SEMESTER EXAMINATIONS SERIES: APRIL 2015 TIME: 2 HOURS

### **INSTRUCTIONS:**

- Answer question **ONE (Compulsory) and** any other **TWO** questions *This paper consists of Two printed pages* 

### **QUESTION 1 (Compulsory)**

- a) i) Outline **FOUR** classes of lathe tools
  - ii) Outline **FOUR** lathe operations
  - iii) What is the difference between facing and turning.

#### (10 marks)

b) For turning a carbon steel cylinder of length 3.6m and diameter 0.24m at a feed rate of 0.7mm/rev with a HSS t00, one of the two available cutting speeds is to be selected. These two cutting speeds are 120m/min and 68m/min.

The tool life corresponding to the speed of 120m/min is known to be 15 minutes with n = 0.6. the cost of machining time is Ksh. 1.5/sec.

The cost of one tool resharpening is Ksh. 25.

Which of the two cutting speeds should be selected from the point of view of cost of producing the component. Prove your argument. (10 marks)

c) i) List any FOUR ways of classification of drills.ii) List FIVE workholding devices for a drilling machine.

(10 marks)

# **QUESTION 2**

a) Briefly explain the different parts of a centre lathe with the aid of a sketch.	(10 marks)
b) With the aid of sketches briefly describe two different types of drilling machines.	(6 marks)
c) Briefly describe the mechanical quick return mechanism of shaping machine.	(4 marks)
QUESTION 3	
a) Give the difference between a turret and capstan lathe.	
b) Explain briefly with a sketch the main parts of a turret lathe.	
c) Explain briefly the limitations of a centre lathe.	(20 marks)
<b>QUESTION 4</b> a) Discuss how a shaping machine is classified.	
<ul><li>b) Explain how a shaping machine is specified.</li></ul>	(20 marks)
QUESTION 5	
a) Briefly explain <b>FIVE</b> operations that can be carried on a drilling machine.	(10 marks)
b) Briefly explain how <b>FOUR</b> drilling machines can be specified.	(4 marks)
<ul> <li>c) A hole of 25 mm diameter is to be drilled. The depth of the hole is 70mm. the suggested feed is 1.2mm per rev and the cutting speed is 60m/min. Assuming overtravel is 2mm . calculate</li> <li>i) Spindle speed</li> <li>ii) Cutting time</li> </ul>	

iii) Material removal rate

(6 marks)