



TECHNICAL UNIVERSITY OF MOMBASA

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Faculty of Engineering and Technology  
Department of Mechanical & Automotive Engineering  
UNIVERSITY EXAMINATION FOR:  
BTech. Mechanical Engineering  
TMC 4215 : Mechanical Workshop Technology & Practice for Technologists  
SPECIAL/SUPPLEMENTARY EXAMINATION  
SERIES: SEPTEMBER 2018  
TIME: 2 HOURS  
DATE: Pick Date Sep 2018

**Instruction to Candidates:**

You should have the following for this examination

- *Answer booklet*
- *Non-Programmable scientific calculator*

This paper consists of **FIVE** questions. Attempt any **THREE** questions.

Maximum marks for each part of a question are as shown.

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

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**Question ONE**

- With aid of a well labeled sketch compare and contrast up milling and down milling  
( 14mks)
- State at least **SIX** care precautions and maintenance of milling machines, its attachments and tools (6mks)

## Question TWO

- i. Name **TWO** types of abrasive material used in grinder wheels giving example in each(4mks)
- ii. Differentiate between truing and dressing in grinding(4mks)
- iii. State **TWO** advantages of centreless grinding and **TWO** limitations (4mks)
- iv. Find the time required for doing rough grinding of a 16 cm sling step 1 shaft to reduce its diameter from 4.2cm to 4 cm in a grinding wheel of 2cm face width. Assume cutting speed as 16.5m/min and depth of cut as 0.25mm.(8mks)

## Question THREE

- i. Describe at least **THREE** types of Bed Type Milling Machine (6mks)
- ii. State **TWO** work holding and **TWO** tool holding devices in a milling machine (4mks)
- iii. Discuss the at least **FIVE** milling operations(10mks)

## Question FOUR

- i. Define gear hobbing (2mks)
- ii. State **THREE** Advantages and **TWO** limitations of gear hobbing (5mks)
- iii. State **TWO** methods of indexing (4mks)
- iv. State **THREE** methods of gear finishing processes (6mks)
- v. What spindle speed would be required to turn a 150 mm diameter cast iron component using cemented-tungsten-carbide tooling at a cutting speed of 160 m/min?(3mks)

### Question FIVE

- i. Differentiate universal milling and plain milling machines(6mks)
- ii. State the Advantages of down climbing milling and Disadvantages of up climbing Milling(4mks)
- iii. A 20,5 cm Cast iron surface is to be faced on a milling machine with a cutter having a diameter of 10 cm and having 16 teeth for the cutting speed and feed are 50m/min and 5 cm/min respectively, determine the milling time, rpm and feed/tooth(10mks)

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***Happy Holidays***