



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF SCIENCE AND  
TECHNOLOGY**

**(MMUST)**

MAIN CAMPUS

UNIVERSITY EXAMINATIONS  
2021/2022 ACADEMIC YEAR

**FOURTH YEAR SECOND SEMESTER EXAMINATIONS  
(SPECIAL/SUPPLEMENTARY EXAMINATION)**

**FOR THE DEGREE  
OF  
BACHELOR OF EDUCATION IN TECHNOLOGY EDUCATION**

**COURSE CODE: TEM 481**

**COURSE TITLE: MECHANICAL TECHNOLOGY AND PRACTICE V**

**DATE: 4/10/2022**

**TIME: 2 HOURS 3:00 PM – 5:00 PM**

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MMUST observes ZERO tolerance to examination cheating

The paper consist of 3 printed pages (3) Please turn over

***INSTRUCTIONS TO CANDIDATES***

Question One (1) is compulsory Answer  
Any Other TWO (2) Questions

**Question One**

- a) Explain TWO reasons behind development of Unconventional Machining as alternative but important machining process. (4 Marks)
- b) Using a well labeled schematic diagram explain basic working principle of Electro-Discharge Machining (EDM) process. (6 Marks)
- c) Explain TWO functions of dielectric fluid used in Electro-Discharge Machining (EDM). (4 Marks)
- d) Discuss TWO reasons behind discouraging the use of explosive forming as a High Energy Rate Forming (HERF) process. (4 Marks)
- e) Discuss THREE instances you recommend use of High Energy Rate Forming (HERF) as modern forming process over conventional forming processes such as forging. (6 Marks)
- f) Discuss THREE factors affecting material removal rate in Electro-Chemical Machining (ECM) process. (6 Marks)

**Question Two**

- a) With help of well labeled schematic diagram describe the mechanism of material removal in Electro-Chemical Machining (ECM) process. (8 Marks)
- b) Explain TWO functions of electrolyte used in Electro-Chemical Machining (ECM) process. (4 Marks)
- c) Using a label schematic sketches describe the basic mechanism of material removal in Ultrasonic machining (USM) process. (8 Marks)

**Question Three**

- a) Use neat sketches to discuss operation Electro-hydraulic Forming as a High Energy Rate Forming (HERF). (6 Marks)
- b) Discuss FOUR situations where you prefer Electro-Discharge Machining (EDM) over Electro-Chemical Machining (ECM) process. (8 Marks)
- c) Explain THREE main uses of water in the High Energy Rate Forming (HERF) specifically in explosive kind of forming process. (6 Marks)

**Question Four**

- a) Join the following parts of a Computerized Numerical Control (CNC) Machine to show its representative diagram and explain the function of each of the parts. (10 Marks)
  - i) Input Device
  - ii) Central Processing Unit/ Machine Control Unit
  - iii) Machine Tool
  - iv) Driving System
  - v) Feedback Devices
  - vi) Display Unit
- b) Discuss THREE limitations of Ultrasonic machining (USM) process. (6 Marks)
- c) Explain TWO functions of constant supply of abrasive grains or slurry used in Ultrasonic machining (USM) process. (4 Marks)