



*(University of Choice)*

**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS  
2020/2021 ACADEMIC YEAR**

**FIRST YEAR FIRST SEMESTER EXAMINATIONS**

**FOR THE DEGREE**

**OF**

**BACHELOR OF TECHNOLOGY EDUCATION IN CIVIL  
ENGINEERING, ELECTRICAL ENGINEERING AND  
MECHANICAL ENGINEERING**

**COURSE CODE: TEC 101**

**COURSE TITLE: INTRODUCTION TO TECHNOLOGY  
EDUCATION**

**DATE: TUESDAY 26<sup>TH</sup> JANUARY 2021 TIME: 3.00 – 5.00PM**

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**INSTRUCTIONS:**

1. This paper contains **FIVE** Questions
2. Answer question **ONE** and any other three questions
3. Marks for each question are indicated in the parenthesis.
4. Examination duration is **2 Hours**

MMUST observes **ZERO** tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over.

**Question 1 (14mks)**

- i) What is fire? (1mark)
- ii). What you understand by the term ‘fire safety’? (1mark)
- iii). When you enter the workshop you notice smoke bellowing slowly from a power machine at one end of the machine floor. State what you will do to save the situation as you put off that smoke (1mark)
- iv). Accidents in the workshop don’t just occur they are caused. Name three potential sources of accidents in a workshop (3marks)
- v). Name **three** reasons that make us prevent occurrence of accidents in the workshop. (3marks)
- vi). Name **three** procedures to undertake in the event of an accident in the workshop. (3marks)
- viii) For what two reasons do we carry out first –aid on an accident victim? (2marks)

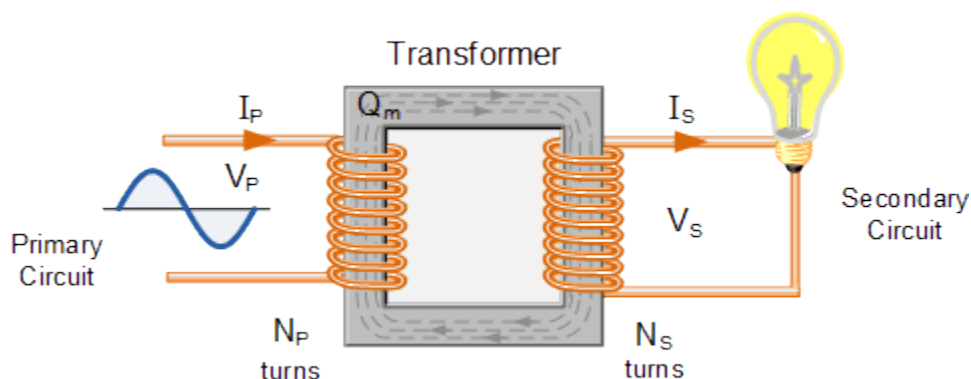
**Question 2. (12mks)**

Use clearly labeled diagrams to distinguish between the following Building and Civil engineering construction terms:

- i). Setting-out (3marks)
- ii). Foundation (3marks)
- (iii) What do you understand by the term ‘site clearance’ as used in building construction work? (1mark)
- (iv) Mention two materials you would use in each category below:-
  - a) Walling    b) Roofing of a residential house. (2marks)
- (v) Make labeled diagrams and state one use of each of the tools named below:-
  - a) Claw hammer    b) Hand saw as they are used in Woodworking processes.(3marks)

**Question 3 (12mks)**

Below is the diagram of an electric transformer. If  $N_p$  is 480 turns,  $V_p$  is 240V.



- i). what should be the number of turns in secondary coil,  $N_s$  if it carries a secondary voltage  $V_s$  of 360 volts? (2marks)
- ii). How much current should be in the secondary coil,  $I_s$  if the primary coil,  $I_p$  had 10.0 Ampres (2marks)

- iii). what is the transformer turns ratio? (1 marks)
- iv). is this a step-up or step-down transformer? (1 mark)
- v). what is the transformer stepping up? (1 mark)
- vi). what would you expect to see on the brightness of the bulb when in the secondary circuit compared to when the bulb would be in the primary circuit? (1marks)
- vii). Explain clearly what 'mutual induction' process is concerning transformers? (1 marks)
- (viii). Show using a simple line circuit that current entering a junction is equal to current leaving the same junction. Hence show that current at such a junction is equal to Zero. (2marks).
- (ix). Name two other power circuit installations or devices that would be required on a domestic /industrial wiring. (1mark)

#### Question 4 (12mks)

- i). Name and draw in order the four explicit stroke cycle of motor combustion engine (4marks)
- ii). With reference to tools and equipment carried out in the mechanical workshop, draw and label the following tools: a) Spring divider b) Try square c) Centre Punch d) ball pain hammer (4marks)
- (iii) Use illustrated drawings to differentiate between a steel rule and a steel ruler as an engineer's measuring tool. (2marks)
- (iv) Use neat sketches to show the difference between a hand file and a flat file. (2marks)

#### Question 5 (12mks)

- i). State Four main uses of computers (2marks)
- ii). what is a computer network? (1mark)
- iii). sketch any three topology examples of computer networks. (3marks)
- iv). Mention one advantage of institutional computer networks. (1mark)
- v). Distinguish between LAN and WAN as acronyms used in computer networks (2marks)

(vi). Copy and complete the following table concerning careers in Kenya. (3marks)

| s/n | Academic Qualification | Job Expectation                            | Possible Employer |
|-----|------------------------|--|-------------------|
| 1   | ICT communication      | --   | Safaricom Co.     |
| 2   | --                     | Telephone operator (exchange switch box)   | --                |
| 3   | BTED mechanical        | Mechanical Trainer at National Polytechnic | --                |
| 4   | Bachelor in Nursing    | --   | --                |
| 5   | --                     | Roads Surveyor                             | --                |
| 6   | --                     | Electrical installation                    | KPL               |