



(University of Choice)

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

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS  
2021/2022 ACADEMIC YEAR**

**SECOND YEAR SECOND SEMESTER EXAMINATIONS**

**FOR THE AWARD  
OF  
DIPLOMA IN MECHANICAL ENGINEERING**

**COURSE CODE: DME 062**

**COURSE TITLE: COMPUTER PROGRAMMING**

**DATE:** Thursday 28<sup>th</sup> April, 2022

**TIME:** 1.00p.m – 3.00p.m

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**INSTRUCTIONS TO CANDIDATES**

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS.  
QUESTION ONE CARRIES 30 MARKS AND ALL OTHERS 20 MARKS EACH.

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

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**Question One [30 marks]**

- a. Define the following terms as applied to computer programming;
- i. Operator [1 mark]
  - ii. Variable [1 mark]
  - iii. String [1 mark]
  - iv. Identifier [1 mark]
  - v. Statement [1 mark]
- b. Give and explain the *four* kinds of computing environments. [4 marks]
- c. Compare and contrast between a Compiler and an Interpreter. [4 marks]
- d. Write an algorithm to find out whether a number is odd or even. [5 marks]
- e. Differentiate between Machine, Assembly, and High Level Languages. [6 marks]
- f. List and briefly explain any *six* characteristics of a good algorithm. [6 marks]

**Question Two [20 marks]**

- a. Write a BASIC program which will accept a pair of numbers as input and output a message to say which is the larger of the two. Ensure that your program allows for the input of two equal numbers. [6 marks]
- b. Write a BASIC program which will print a table of the values of the function  $x + (1/x)$  for values of  $x$  from  $-2$  to  $+2$  in steps of  $0.5$ . Make sure you allow for the printing of an appropriate message when  $x = 0$ . [7 marks]
- c. Write a BASIC program to evaluate the formula  $s = ut + \frac{1}{2}t^2$ , where  $f = 9.81$ , for various values of  $u$  and  $t$ . [7 marks]

**Question Three [20 marks]**

- a. Write a BASIC program for using a defined function in the plotting of a simple graph. [12 marks]
- b. Write a BASIC program for converting degrees Centigrade to degrees Fahrenheit and vice versa. [8 marks]

**Question Four [20 marks]**

- a. Write a BASIC program which will read in two lists each having 20 elements. Print out the two lists in two adjacent columns and a third column which contains the sums of the corresponding elements of the two lists. At the end print out the pair of numbers which have the greatest sum. [10 marks]
- b. Write a BASIC program which will read in two lists of different lengths, print out the two lists and a list of those numbers which occur in both lists. [10 marks]

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**Question Five** [20 marks]

a. Write a BASIC program to calculate the standard deviation from the mean of a set of numbers. [4 marks]

b. Write a BASIC program which will produce the following output. [6 marks]

```
RUN
HOW MANY NUMBERS
? 6
INPUT THE NUMBERS ONE AT A TIME
? 6
? 4
? 1
? 8
? 7
? 9
THE AVERAGE OF THE NUMBERS IS      5.83333
END AT 0110
*
```

c. **Mie Oil** Company sells oil at a price which depends on the amount bought by the user. Up to 500 litres are charged for at Ksh. 90 a litre plus a basic charge of Ksh. 25. Between 501 litres and 1000 litres the charge is Ksh. 80 a litre plus Ksh. 12.50 standing charge. Over 1000 litres the price is Ksh. 70 a litre. Write a BASIC program to calculate and print the price of any amount of oil and test it for inputs of 280, 650 and 1200. [10 marks]