



TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING, DEPARTMENT OF
BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

BSC MECHANICAL/ELECTRICAL/CIVIL ENGINEERING

ICS 2175/TEE 4211/ TEE 4311/ TCS 4131/ SMA 2174: COMPUTER PROGRAMMING

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2 HOURS

DATE: Sep 2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No questions. AttemptChoose instruction.

Do not write on the question paper.

Question ONE

- a) With the use of a flow chart , explain the following control structures:
 - i. For Next loop
 - ii. Do.... While loop
 - iii. Select Case statement
 - iv. If-Then statement (8 Marks)
- b) Distinguish between a variable and a constant as applies in C programming. (2 Marks)
- c) Discuss the features and limitations of the following:
 - i. Procedural programs.
 - ii. Structural programs [4 Marks]
- d) Discuss any four common types of programming errors. (4 Marks)
- e) Define the term array, discuss how array elements are accessed and write a statement that declares and initializes an array to store the marks of five students. (4 Marks)
- f) Write the syntax and explain the parts that make up a for loop. (2 Marks)
- g) Differentiate between the following flow control statements, citing an example usage of each:
Exit and break [2 Marks]

- h) Write a program in C that makes use of a structure called STUDENT – stores student name and registration number, test scores obtained in two subjects, and Result. Displays the student details and the total of the test scores. The program should create one structure object called graduate (6 Marks]

Question TWO

- a) Define a function and explain why they are used in programming. [5 Marks]
- b) Write an object oriented program in C++ that outputs all the numbers between 100 and 300 that are divisible by 3 and the count of those numbers. (5 Marks)
- c) Write an object oriented program that allows a user to key in a number between 1 and 7; the program then outputs the respective day of the week using the SWITCH/SELECT CASE statement. (5 Marks)
- d)
- Write a code to declare a function that calculates the area of a rectangle and discuss the parts that make up the function. (3 Marks)
 - Discuss what you understand by function invoking and write a code snippet to invoke the function declared in 3(d) above. (2 Marks)

Question THREE

- a) Write a program in that accepts and stores the CAT marks of ten students in an array, the program then calculates the outputs the: sum and average CAT marks. (8 Marks)
- b) Write a program that allows a user to key in the quantity and the cost of each item a customer has bought; the program should then display the unit cost, the quantity and the total cost for each item bought. The program should have two functions; one for input and the other for display. It should create a structure called items and two objects namely bread and milk. (6 Marks)
- c) Consider the following C function, intended to receive a string as an argument and return a reversed string as a result.

```
Void main ()
{
Intno,rem
Printf("Enter any number");
Scanf("%d",no);
While(no>0);
{
rem=no%10;
Printf("%d",rem);
No=no/10;
}
```

- i) Identify three bugs in this function(3 Marks)
- j) Write a corrective version of this function [3 Marks]

Question FOUR

- a) What is the difference between a local and global variable in C? (Consider variable scope, storage and initialization.) [4 Marks]
- b) What are the properties of a static member variable in a C++ class? [4 marks]
- Briefly explain pointer in C. Give an example code snippet involving pointers in which it would be inappropriate to use pointer, and explain why.[4 Marks]
- b) What is function template? Write a function template to swap two given numbers [5 Marks].

- c) Explain any three library functions provided in C to manipulate Strings [3 Marks].

Question FIVE

- a)
- i) Explain what is meant by the term abstract data type and how abstract data types are implemented using an object oriented programming language? (3 marks)
 - ii) Give an example of an abstract data type using structures [5 Marks]
- b)
- i) Write a function called POWER that computes X raised to the power of Y and returns an integer type value. [5 Marks]
 - ii) Pass the two values from the MAIN program and display the results [3 Marks]
- c) Write a program that will print all prime numbers that are between 1 and 100. [4 Marks]