



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR
BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)

SMA 390: SCIENTIFIC PROGRAMMING

DATE: 25 /9/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS)

- a) i) Explain the difference between relational and assignment operators as used in C++ (4 marks)
- ii) State if the following variables names can be used in C++ with reasons: (8 marks)
- `7num`, `const`, `switch`, `my_val`, `int`, `&_num1`, `num_2`, `num.num`;
- b) i) Write a C++ program that will prompt a user to key in three numbers then the program finds the largest of three numbers. (8 marks)
- ii) By use of examples explain the difference between an escape sequence and a format specifier. (6 marks)
- iii) What is function overloading? Use an example. (4 marks)

QUESTION TWO

- a) Define the term recursive function as used in C++ programming. (2 marks)
- b) Explain the difference between a modifier and storage class specifiers as used in C++ programming. Use two examples for each. (6 marks)

- c) Write a program in C ++ to accept a grade and declare the equivalent description. Use if.....else statement. (12 marks)

Grade	Description
E,e	Excellent
V,v	Very good
G,g	Good
A, a	Average
F,f	Fail

QUESTION THREE

- a) State three types of data types in C++. (2 marks)
- b) Explain the use of the sizeof operator giving an example (2 Marks)
- c) Write a C++ program that will prompt a user to input a number and checks. (8 marks)
- Use switch statement.

Number	Day
1	Monday
2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday
7	Sunday
Any other number	INVALID

- d) Write a program to find the factorial value of any number entered through the keyboard. (8 marks)
- Use while loop.

QUESTION FOUR

- a) Explain the difference between pass by value and pass by reference as used in C++ (4 marks)
- b) Explain each of the following statements as used in C programming language. (8 marks)
- i) switch;
 - ii) default;
 - iii) continue;

- iv) break.
- c) Write a C++ program that will calculate the area of a circle (πr^2) and volume of a sphere ($V = \frac{4}{3} \pi r^3$). Use function prototype. (8 marks)

QUESTION FIVE

- a) i) Differentiate between a structure and a union as used as used in C++. (4 marks)
- ii) Write a structure declaration for a structure called admission that has the following members: (6 marks)
- Name.
 - Age.
 - Course.
 - Admission number.
 - Marks for English and Kiswahili.
- iii) Use the structure above to write a statement that creates a structure variable called student. (2 mark)
- b) Write a C program that will accept user input (x,y,z), the program should calculate the average of the numbers and output results. (4 marks)