

UGANDA MARTYRS UNIVERSITY

UNIVERSITY EXAMINATIONS
FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEM

END OF SEMESTER FINAL ASSESMENT

SEMESTER 1, 2022/2023

COURSE	:	BACHELOR OF COMPUTER SCIENCE
PAPER	:	STRUCTURED PROGRAMMING
CODE	:	SP 2022
SEMESTER	:	ONE
DATE	:	
TIME	:	
DURATION	:	3 HOURS

Instructions

3. Attempt Question 5 and any other 3 Questions
 4. Time Allowed 3 Hours Only
 5. Use of relevant Illustrations/diagrams will earn you a bonus mark (s)
 6. Remember to indicate the question number you have answered.
 7. Write your name, course and registration number on all your answer sheets
 8. All answers should be written on the answer booklet
 9. All university rules apply
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Questions

1.
 - a. Consider the following problem, Emma wants to add two numbers using a computer program. Prepare a flow chart showing the steps required to solve Emma's problem (12 Marks)
 - b. Explain the difference between an algorithm and a compiler (6 Marks)
 - c. Variables are very essential in C programming, what do you understand by the term variables? (7 Marks)
2.
 - a. Comments are used everywhere and also in C programming comments are used, what are comments in C programming and what are they used for? Explain with demonstrations the types of comments we have in C programming. (6 Marks)
 - b. Explain the different data types we have in C programming and provide the sizes of each data type (The size should be in bits) (7 Marks)
 - c. What do you understand with the following terms under variables? Explain with examples (8 Marks)
 - a) Declaring Variables
 - b) Variable Assignment
 - c) Initiating Variables
 - d) Constants Variables
 - d. What is the difference between IF and Switch control structures as used in C programming? (4 Marks)
3.
 - a. What is the meaning of functions in C programming (4 Marks)
 - b. Explain the types of functions in C programming (12 Marks)
 - c. What are the advantages of functions in C programming (7 Marks)
4.
 - a. Explain the differences between arrays and structures in C programming? (6 Marks)
 - b. What is the role of **scanf** and **printf** functions in C programming? (6 Marks)
 - c. What is the meaning of keywords in C programming, provide some examples (13 Marks)
 - d. Why are keywords not recommended to be used as variable names in C programming (13 Marks)
5. Peter wants to be able to add, subtract, multiply and divide two numbers entered from the keyboard. As a computer scientist, develop a C program that Peter can use to solve his problem. (25 Marks)
6. Arrays are derived datatypes, outline the properties of arrays (6 Marks)
 - b. Write a code that demonstrates both declaration and initialization of an array. (4 Marks)
 - c. Explain using a demo code how elements in an array can be accessed. (5 Marks)

d. Explain the meaning of these formats as applied in **printf** and **scanf** functions (9 Marks)

I. %d

II. %c

III. %f

7. Every C program has a main function as part of its body, explain what the main function does in C programming. (4 Marks)

b. Differentiate between **int main** and **void main** as used in C programming. (6 Marks)

c. The last line of code in the main function is always a **return 0**; what is its role in a main function? (4 Marks) See demo below

```
int main()
{
    return 0;
}
```

d. Complete the code below to read **num1**, **num2** and **firstName** from the keyboard and print them on the screen? (6 Marks)

```
int main(int num1, int num2, char firstName)
{
    return 0;
}
```

e. The first lines of any C program are always header files, what do you understand by the term headers in C programming and give an example. (5 Marks)

8. Explain what each of the line code does in the program below (20 Marks)

```
#include <stdio.h>
int main()
{
    float length, width, perimeter;
    printf("Enter length of the rectangle: ");
    scanf("%f", &length);
    printf("Enter width of the rectangle: ");
    scanf("%f", &width);
    perimeter = 2 * (length + width);
    printf("Perimeter of rectangle = %f units ", perimeter);
    return 0;
}
```

b. Assuming i enter 5.4 as my length and 3.2 as my height from the keyboard, what will be output of the above program? (5 Marks)