



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS
UNIVERSITY UNDERGRADUATE EXAMINATIONS
1st YEAR 1ST SEMESTER 2016/2017 ACADEMIC YEAR
MAIN CAMPUS

COURSE CODE: SCS 103

COURSE TITLE: INTRODUCTION TO PROGRAMMING

EXAM VENUE: STREAM: SMAS

DATE: EXAM SESSION:

TIME: 2.00 HOURS

INSTRUCTIONS:

- 1. Answer Question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on the question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

Question One (30 Marks)

- a) Using examples, define the following concepts in programming; (8 marks)
- i. Variable
 - ii. Identifier
 - iii. Keyword
 - iv. Pseudocode
- b) Discuss the steps involved in program development (5 marks)
- c) A compiler and an interpreter are two examples of language processors. Compare and contrast the two (5 Marks)
- d) Write appropriate pseudocode to represent the following statements;
- i. M is equal to N (2 Marks)
 - ii. X is not equal to Y (2 Marks)
 - iii. 2 is not equal to either 1 or 0 (2 Marks)
- e) Why are program control structures critical in programming? (2Marks)
- f) Using two examples, illustrate the implementation of looping in programming (4 marks)

Question Two (20 Marks)

- a) State the function of each of the following special character sequences used in C
- i. `\n` (2Marks)
 - ii. `%.2f` (2Marks)
 - iii. `&&` (2Marks)
- b) A retail shop offers discounts on its merchandise to its customers as indicated in the table below;

Purchase amount	Discount (%)
>10,000	10
< = 10,000 and > 7,000	5
< = 7,000 and > 5,000	3
<= 5,000	0

- i. Write an appropriate algorithm to represent this problem (3Marks)
 - ii. Write a program to calculate and display the amount payable by a customer (5Marks)
- c) The following code contains errors. Rewrite this code correctly (6 marks)

```
#include <studio.h>
int main ( )
{
printf("Enter your age:");
scanf("%C", age)
```

```
Printf("Your age is %d, & age);
```

```
}
```

(6 Marks)

Question Three (20 Marks)

- a) Using a suitable example in each case, describe the following terms in programming;(6 marks)
- b) i) Argument
ii) Preprocessor directive
iii) White space
- b) The final mark for a student is obtained by computing the sum of three continuous assessment tests (CATs), two assignments and a final examination. Create a program to execute this task (7Marks)
- c) what is the importance of comments in programming (3Marks)
- d) Using an appropriate example, differentiate between the 'else-if' and the 'switch' statements (4Marks)

Question Four (20 Marks)

- a) i) Identify two types of arrays based on the location they are declared and used (2 Marks)
ii) Declare and initialize an array called AVERAGES to contain the following averages;

56.20	45.30	67.45	90.45
23.65	30.00	56.20	67.30
20.70	35.90	67.23	78.35
60.65	93.50	45.60	67.20

(4 Marks)

- iii) State reasons why one would use an unsized array in C (2 Marks)
- b) i) Algorithms fall under two broad categories. Briefly discuss these categories (4 Marks)
ii) Discuss the steps involved in performing the average-case analysis of algorithms (8 Marks)

Question Five (20 Marks)

A program is required to calculate an employee's net salary from the gross pay. The net salary is given by gross pay less deductions. Deductions include: 25% of gross pay as tax, KSh.250 as NSSF contribution and KSh.320 as NHIF contribution.

- a) Design a flowchart for the problem. (5Marks)
b) Implement the above problem using the C program (15Marks)