



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

DEPARTMENT OF COMPUTER SCIENCE & SOFTWARE ENGINEERING

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF DEGREE IN
INTERNATIONAL RELATIONS AND DIPLOMACY WITH IT**

4TH YEAR 1ST SEMESTER 2015/2016 ACADEMIC YEAR

(NAIROBI LC)

COURSE CODE: SCS 404

COURSE TITLE: PRINCIPLES OF FUNCTIONAL PROGRAMMING

EXAM VENUE: 9TH FLOOR

DATE: 16TH / 12/2016

EXAM SESSION: 9AM- 11AM

TIME: 2 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 1 (30 marks)

a) Define the following functional programming language terms.

i. Variable

ii. Computer program

iii. Function

iv. Compiler

v. Assembler

(5 marks)

b) In programming (*functional*) code explain the differences between local variable and Global Variable (4 marks)

c) Explain three advantages functional programming as a high –level language.

(3 marks)

d) Explain the different between functional programming **AND** imperative programming

(2marks)

e) Explain using examples the usage of any **THREE** operators and precedence's to access modifiers in programming language. (6 marks)

f) Outline **TWO** features of each of the following types of programming languages:

i. Machine language,

ii. Assembly language,

iii. Functional languages.

(6 marks)

g) Describe each of the following program design tools.

iv. Pseudo code,

v. Flowchart,

vi. Structure chart.

vii. Algorithm,

(4 marks)

Question 2 - (20 marks)

a) Explain the term **control structures** as used in programming.

[2 marks]

- b) With the aid of flowchart constructs, describe each of the following control structures:
- i) Selection [12 marks]
 - ii) Sequence
 - iii) Iteration
- c) Draw a flowchart for listing and computing the sum of the first 50 natural numbers. [6 marks]

Question 3 - (20 marks)

- a) A function has three components a list of **formals**, a **body**, and **environment** of definition, Discuss the 3 components. (6 marks)
- b) Formals and body are represented by a lambda expression give example of a lambda expression. (2 marks)
- c) Write a Pseudo code that displays the string “**HELLO WORLD**” on **OUTPUT SCREEN** on **ENTER**. (6 Marks)
- d) Write an Algorithm of area of rectangle ($A=L*W$) (6 marks)

Question 4 – (20 marks)

- a) Describe the term **data structure** as used in programming [2 marks]
- b) Outline any **FOUR** *data structures* recognized in programming [8 marks]
- c) Distinguish between *compiling* and *testing* in reference to programming [4 marks]
- d) Describe three errors in programming. [6 marks]

Question 5 – (20 marks)

- a) Explain any **THREE** reasons for algorithm analysis. [6 marks]
- b) Outline the steps in the system development life cycle in their logical sequence. [6 marks]
- c) Lisp is one of the functional programming language used for artificial intelligence applications give **FOUR** examples of these applications [8 marks]