



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 2016/2017 ACADEMIC YEAR

NAIROBI LERNING CENTRE – SCHOOL BASED

COURSE CODE: SCS 404

COURSE TITLE: PRINCIPLES OF FUNCTIONAL PRORAMMING

EXAM VENUE: 9TH FLOOR DATE: 16/12/2016 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**

1. 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)
2. 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
 - ii) Sequence
 - iii) Iteration (12 marks)
- b) Draw a flowchart for listing and computing the sum of the first 50 natural numbers. (6 marks)
3. 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)
4. 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)
5. 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)