



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

SCT 304: COMPILER CONSTRUCTION

DATE: Friday 13th April, 2012

TIME: 11.00 a.m. – 1.00 p.m.

INSTRUCTIONS

Answer any three questions

QUESTION1 [20 MARKS]

a) Provide definitions for the following terms/phrase.

- i. Assembler
- ii. Linker
- iii. Loader
- iv. Debugger

[4 marks]

b) Distinguish between a compiler and an interpreter

[3 marks]

c) Describe four challenges encountered in compiler construction.

[4 marks]

d) Outline four qualities of a good compiler

[4 marks]

e) Explain the meaning of the following extended BNF terms

[3 marks]

- i. [xxx]
- ii. [yyy]*
- iii. [zzz]+

- f) Distinguish between load time dynamic linking and runtime dynamic linking [4 marks]
- g) What is symbol name resolution in compiler construction? [4 marks]
- h) Outline the steps in process loading [4 marks]

QUESTION 2 [20 marks]

- a) Distinguish between top down parsing and bottom up parsing. Give an example for each [8 marks]
- b) Define the following compiler terms [5 marks]
- i. Lexeme
 - ii. Token
 - iii. String
 - iv. Regular expression
 - v. Context free grammar
- c) Give three characteristics of an ambiguous grammar [3 marks]
- d) Describe the four elements of a context free grammar language [4 marks]

QUESTION 3[20 marks]

- a) Define the term symbol table as used in compiler construction [2 marks]
- b)* Describe five components of a symbol table [5 marks]
- c) Outline four possible implementations of a symbol table [4 marks]
- d) Describe five common operations carried out on a scoped symbol table [5 marks]
- e) Outline four roles of a scanner [4 marks]

QUESTION 4[20 marks]

- a) Define the term finite automata as used in compiler construction [2 marks]
- b) List four components of a finite state machine [4 marks]
- c) Describe three guidelines for designing a semantic analyzer type checker [3 marks]
- d) Name four programming constructs that you would enlist for part c above [4 marks]
- e) Describe the main stages in shift reduce parsing [5 marks]

QUESTION 5 [20 marks]

- a) Describe the structure of a compiler in terms of front end, back end and middle end [3 marks]
- b) Distinguish between single pass and multiple pass compilers giving an example for each [4marks]
- c) List three advantages and two disadvantages of two-pass compilation [5 marks]
- d) Outline three action of semantic analyzer [3 marks]
- e) Explain the five actions of a code generator [5 marks]