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University Examinations 2012/2013

THIRD YEAR, SECOND SEMESTER EXAMINATIONS FOR DEGREE OF BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY

BCT 2311: COMPILER CONSTRUCTION

DATE: DECEMBER 2012 **TIME: 2 HOURS**

INSTRUCTIONS: *Answer questions **one** and any other **two** questions.*

QUESTION ONE (30 MARKS)

a) Using a well labeled diagram, define the term a compiler. (5 Marks)

b) Define the following terms (9 Marks)

i. Tokens
ii. Patterns
iii. Lexemes

c) Discuss the advantages offered by grammar of both language designers and compiler writers. (8 Marks)

d) Construct a modernistic finite automation (NFA) for each of the following regular expressions (8 Marks)

i. (a|b)*
ii. (a*|b*)*
iii. ((e|a)b*)*

QUESTION TWO (20 MARKS)

a) Critically analyze the phases of a compiler. (12 Marks)

b) There are several useful compiler construction tools. List and elaborate on any four compiler construction tools? (8 Marks)

QUESTION THREE (20 MARKS)

a) Using examples, describe the two classes of parsing methods. (8 Marks)

b) Define the three loop optimization techniques. (12 Marks)

QUESTION FOUR (20 MARKS)

a) With the help of an example list the various properties of a Parse tree. (10 Marks)
b) Translate the following BNF for a U.S. postal address into English. (10 Marks)

<postal-address>::+<name-part> <street-address> <zip-part>

<name-part>::=<personal-part> <last-name> <opt-suffix-part> <EOL>

|<personal-part> <name-part>

< personal-part>::<first-name>|<initial>"."

<street-address>::=<house-num> <street-name> <opt-apt-num> <EOL>

<zip-part>::=<town-name>"," <state-code> <ZIP-code> <EOL>

<opt-suffix-part>::="Sr."|"Jr."|<roman-numeral>""

QUESTION FIVE (20 MARKS)

a) What are the goals of error handling in a parser? (10 Marks)
b) Discuss the following terms in conjunction with the typical operation of compilers. (10 Marks)

i. Preprocessors
ii. Assemblers
iii. Loaders and link editors