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University Examinations 2013/2014

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE

ICS 2204: PROGRAMMING LANGUAGES

DATE: APRIL 2014   TIME: 2HOURS

INSTRUCTIONS: *Answer question **one** COMPULSORY and any other **two** questions*

QUESTION ONE – (30 MARKS)

a) Define the following terms as used in programming :   (5 marks)
   i.   Exception handling
   ii. Type checking
   iii. Lexeme
   iv. Token
   v.   Metalanguage

b) Differentiate between the following concepts as used n programming languages:
                                                                 (6 marks)
   i.   Language generator and language recognizer

   ii. Syntax and semantics

   iii. Static binding and dynamic binding

c) A programming language can be primarily evaluated using three major criteria; discuss
   them.   (6 marks)

d) Discuss the two major influences on language design.   (4 marks)

e) How can knowledge of programming languages benefit the whole computing
   community?   (4 marks)

f) Given the following programming statement in C++; describe what it does and break it down into its component lexemes and tokens. (5 marks)

Index = 2* count +17;

QUESTION TWO (20 MARKS)

a) Discuss nay five reasons why the study of programming language concepts is important. (10 marks)

b) Discuss briefly how BNF can be used to describe a language. (5 marks)

c) Write an assignment statement with one arithmetic operator in a language you know. For each component of the statement, list the various bindings that are required to determine the semantics when the statement is executed. For each binding, indicate the binding time used for the language. (5 marks)

QUESTION THREE (20 MARKS)

a) Consider the following grammar for a typical programming language.

     i.   What operation does the above grammar describe? (1 mark)
    ii.   What identifiers are acceptable in the language? (2 marks)
   iii.   What operations are acceptable in the language? (2 marks)
   iv.   Give three different valid programming statements in the language. (3 marks)

b) Discuss two sets of language evaluation criteria that are in direct conflict with each other? (4 marks)

c) Discuss any four advantages of having support for exception handling built in to a language. (8 marks)

QUESTION FOUR (20 MARKS)

a) Discuss any THREE different aspects of the cost of a programming language.(6 marks)

b) Write a rule that describes C++ if statement. Your rule should support both if and an if
   else.   (4 marks)

c) Extended BNF was introduced to eliminate some inconveniences associated with BNF;
   discuss the three major extensions.   (6 marks)

d) Describe row major order and column major orders as used in multi dimensional arrays.

                                                                            (4 marks)

QUESTION FIVE (20 MARKS)

Discuss the evolution of major programming languages; citing the time period, the contribution
of the language and the motivation for its development.   (20 marks)