Usmanu Danfodiyou University Sokoto.
Departemnt of Mathematics
COMPUTER SCIENCE UNIT
FIRST SEMSETER EXAMINATION, 2017/2018 SESSION

Course Code: CMP409 Title: Compiler Construction II
Time Allowed: 2 Hours Units: 3
Instruction: Answer Four (4) Question Only
DO NOT WRITE ON THIS QUESTION PAPER

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(1)

a. Prove the following properties of regular sets: (i) The difference of two regular set is regular, if RE1 = a(a*) and RE2 = (aa)*. (ii) The complement of a(aa)* is regular.

b. Briefly explain the two types of Finite automata.

c. Define syntax analysis
(2)

a. Discuss code optimization

b. Consider the following simple grammar S ----> SAd A ----> ab | d (i) Construct a parse tree for the above grammar. (ii) Use the parse tree in (b)(i) to determine whether the grammar is left recursive or not.

c. Describe the language generation algorithm of a grammar.
(3)

a. Illustrate with the aid of diagram the memory allocation schemes

b. List the Formal definition of an NDFA.

c. Explain the different classifications of operating systems
(4)

a. Succinctly explain each of the following: (i) Source-to-source compiler (ii) Cross-compiler (iii) Target language

b. Elucidate the usefulness of Backus-Naur Form grammar.

c. Translate the following C++ for loop statement into equivalent assembly language statement: for(i = 1 ; i < = 6 ; i + +) count < < i * 4 ;
(5)

a. What is code generation

b. Succinctly explain each of the following. (i) Garbage collection (ii) Reference Counting.

c. Differentiate between statically and dynamically typed languages. Give two (2) examples of each. (6)

a. Describe each of the following terms: (i) Recognizer (ii) States (iii) Start States

b. Itemise the two (2) basic operations in dynamic storage management.

c. Differentiate between Bottom-up and Reduction step.