

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)  
ORGANISATION OF ISLAMIC COOPERATION (OIC)

Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION

DURATION: 1 Hour 30 Minutes

SUMMER SEMESTER, 2013-2014

FULL MARKS: 75

**CSE 4801: Compiler Design**

Programmable calculators are not allowed. Do not write anything on the question paper.

There are 4 (four) questions. Answer any 3 (three) of them.

Figures in the right margin indicate marks.

1. a) What are the cousins of a compiler? Discuss any two of them. . 3+6  
 b) Briefly discuss various compiler construction tools. 7  
 c) Write short note on error handler. 5  
 d) What are the advantages of: 2+2  
     i. A compiler over an interpreter?  
     ii. An interpreter over a compiler?
2. a) Discuss various syntax *errors* and their recovery strategies. 7  
 b) What are the phases of a compiler? Explain the advantages of designing a compiler in phases. 3+6  
 c) Distinguish among tokens, patterns, and lexemes. 3  
 d) What do you mean by context-free grammar (CFG)? Explain different components of a CFG. 2+4
3. a) Draw a transition diagram to recognize real numbers (float/double in C). 10  
 b) When is a grammar called ambiguous? Explain with example. 7  
 c) What is left factoring and when it is necessary? 8
4. a) What is the configuration of an LR parser? 3  
 b) Find canonical LR(0) set of items for the following grammar and then build the SLR parse table. 9+7

$S \rightarrow aABb$

$A \rightarrow aAc$

$A \rightarrow d$

$B \rightarrow bB$

$B \rightarrow c$

- c) Consider the context-free grammar

$S \rightarrow SS^+ | SS^* | a$

- i. Show how does the string  $aa^+a^*$  can be generated by this grammar.
- ii. Construct a parse tree for this string.
- iii. What language does this grammar generate? Justify your answer.

2+2+2