

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, 2016-2017

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) Draw the block diagram of a language processing system. Briefly describe the functionality of each part of the system. 10
- b) Discuss on lexical errors and their recovery strategies. 10
- c) Classify grammars and show their relationship using Venn Diagram. 5
2. A grammar G is given below:

$S \rightarrow SA$
 $S \rightarrow aB$
 $A \rightarrow bC$
 $A \rightarrow bDa$
 $B \rightarrow BC$
 $B \rightarrow dCb$
 $C \rightarrow aD$
 $D \rightarrow c$

 - a) Does the grammar compatible with predictive parsing? Explain your answer. 10
 - b) Modify the grammar G to make it compatible with predictive parsing. 5
 - c) Find the set of **First** and **Follow** for each of non-terminal in the modified Grammar. 10
3. a) Explain the meaning of *L*, *R* and *k* in the term *LR(k)* grammar. 7
- b) A grammar G1 is given below: 12

$S \rightarrow AaAb \mid BbBa$
 $A \rightarrow a$
 $B \rightarrow b$

Draw the transition diagram showing transitions between LR(1) states for the grammar G1.

 - c) Write a negative review on recursive-descent parsing. 6
4. a) Write short notes on the followings: 12
 - i. Preprocessor
 - ii. Types of parsing
 - iii. Grammar ambiguity
- b) Write a multi-file word count program using Lex. The program should take multiple file names as argument and show the number of characters, words, lines within each file. 13

Example: Assume that the final executable program name is *count*. Then, to find the statistics of three files *file1.c*, *file2.txt* and *file3.l* using the program *count*, the command will be -

\$count file1.c file2.txt file3.l

And sample output (numerical value may vary based on actual file contents):

file - characters - words - lines

file1.c - 213 - 65 - 13

file2.txt - 112 - 26 - 7

file3.l - 327 - 87 - 24

total - 652 - 178 - 44