Roll Number: _____

Thapar Institute of Engineering & Technology Patiala

Computer Science & Engineering Department

BE COE Mid Term Test UCS802: Compiler Construction

March 12, 2019

Time: 02 Hours; MM: 25 Name of Faculty: Dr. Ajay Kumar

Instruction to Students: Attempt all questions. **Assume any missing data.**

1. Diagrammatically represent various phases of Compiler construction. Explain various types of errors detected in each phase of compiler construction. [5]
2. How left recursion is removed from a grammar production? Given the following grammar, remove the left recursion: [4]

$$A \rightarrow Ba \mid Aa \mid c$$
$$B \rightarrow Bb \mid Ab \mid d$$

3. Given the regular expression $r = (a \mid b)^*(a \mid b)^*$
   a) Convert the given regular expression into NFA using Thompson's construction.
   b) Convert the obtained NFA into DFA.
   c) Minimized the obtained DFA. [6]

4. Construct LR(0) items for the following grammar: [5]

$$A \rightarrow (A) \mid a$$

5. Consider the following grammar: [5]

$$\text{exp} \rightarrow atom \mid list$$
$$atom \rightarrow number \mid identifier$$
$$list \rightarrow (\text{exp}\text{-}seq)$$
$$\text{exp}\text{-}seq \rightarrow \text{exp}, \text{exp}\text{-}seq \mid \text{exp}$$

   a) Find firstpos and lastpos of each non-terminal of the grammar.
   b) Construct LL(1) Parsing Table.