MIDTERM Examination – M.Sc. (Computer Science)
Paper : CSMC-203 (Automata and Compiler Design)

Full marks: 30 **Time:75 Minut**

1. Answer **any fifteen** questions. **[15 x 2 marks = 30]**

   a. Verify the following identity :
      1. $(0*01 + 10) * 0 *= (0 + 01 + 10)*$

   b. Draw the transition diagram for a signed exponential number.

   c. What do you mean by the pass of any compiler? How can you reduce the number of passes

   d. Comment on: "Equivalence of PDA's and CFLs".

   e. What are the implications of CNF and GNF of CFG?

   f. Eliminate the left recursion from the following grammar :
      i. $S \rightarrow ABC$; $A \rightarrow Aa \mid d$; $B \rightarrow Bb \mid e$; $C \rightarrow Cc \mid f$

   g. What is a unit production? What are its implications?

   h. What is the concept of input buffering used in lexical analysis?

   i. Write a CFG to represent palindromes.

   j. Differentiate between words, patterns, and lexemes.

   k. What is the role of the parser in the compiler?

   l. What are the causes of grammar ambiguity? How can it be resolved?

   m. What is a symbol table, and what is its role in syntax and semantic analysis?

   n. What kind of errors are reported by the semantic analyzer but not by the syntax analyzer?

   o. Construct Deterministic Finite Automata to accept the regular expression :
      i. $(0+1)* (00+11) (0+1)*$

   p. Do left factoring in the following grammar:
      i. A-> aAB|aA|a
      ii. B-> bB|b

   q. Write a comparison among Static allocation, Stack allocation, and Heap Allocation with the merits and limitations.

   r. What is a reserved word strategy? How is it handled in lexical analysis?