ALCCS – (OLD SCHEME)

NOTE:
- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**

Q.1　　a.　What is meant by intermediate representation (IR)? List the desirable properties of an IR.

　　　　b.　List and define four categories of language processors.

　　　　c.　Let the free list consists of two areas say $area_1$ and $area_2$ of 500 words and 200 words, respectively. Let allocation requests for 100 words, 50 words and 400 words arise in the system. How will first fit and least-fit technique allocate the memory?

　　　　d.　List four tasks performed by the analysis phase of an assembler.

　　　　e.　Define parsing. What is the role of a parse tree?

　　　　f.　Give the basic difference between single pass assembler and two pass assembler.

　　　　g.　Construct a DFA that can recognize only string 0120 on the input symbols{0,1,2}.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(7 × 4)

Q.2　　a.　Show the output of two-pass linker for two assembler-language programs given below:

A START 0	B START 0
INTDEF W	W INTUSE
Z INTUSE	INTDEF Z
LOAD Y	LOAD W
STORE Z	STORE X
W CONST 15	X SPACE
Y CONST 13	Z SPACE
END	END

　　　　　Also show intermediate assembly of both the programs in terms of object code, definition table and use table.　　　　　　　　　　　　　　　　　　**(14)**

　　　　b.　Write a brief note on Redefinable symbols.　　　　　　　　　　　**(4)**

Q.3　　a.　List the various types of loaders highlighting features for each of them. Describe dynamic linking.　　　　　　　　　　　　　　　　　　　　　　　**(9)**

b. How literal references are handled in Pass I and Pass II assembler? **(5)**

c. What is a search data structure? List the operations performed on search data structures. **(4)**

Q.4 a. What is Operator precedence grammer? Construct operator precedence matrix for the following grammer

    S ::= |-- E --|
    E ::= E+T | T
    T ::= T*V |V
    V ::= <id> | (E)   **(8)**

b. Parse the statement
    SumSQ: = sumSQ + value * value   **(10)**

Q.5 a. Explain various data structures used in one-pass macroprocessor. **(6)**

b. What is meant by memory allocation? Differentiate between static and dynamic memory allocation scheme. **(6)**

c. What is an expression tree? Draw an expression tree for the string f+(x+y)*((a+b)/(c-d)) and show the evaluation order. **(6)**

Q.6 a. What is the goal of advanced macro facility? Discuss two features to facilitate alteration of flow of control during macro expansion. **(6)**

b. Discuss code generation during different phases of compilation. **(6)**

c. What are the factors to be considered while deciding between one-pass and multi-pass compiler design? **(6)**

Q.7 Write notes on any **FOUR** of following:

    (i)   Stack based allocation model
    (ii) Parameter passing mechanisms
    (iii) Lex
    (iv) Chomsky hierarchy of grammer
    (v)   Categories of text editors   **(4 × 4.5)**