

N.B. (1) Question No. 1 is compulsory.

(2) Attempt any four questions from remaining six questions.

(3) Make suitable assumptions wherever necessary and state them clearly.

1. (a) Explain how forward reference problem is handled in one pass assembler. 5
- (b) Describe the types of parameters in macro processing with example. 5
- (c) Differentiate between top-down and bottom up parsers. 5
- (d) What is ambiguous grammar? Give an example. 5
2. (a) Test whether the given grammar is LL(1), and also construct a predictive parsing table for the same: 10
  - $S \rightarrow AaAb \mid BbBa$
  - $A \rightarrow \epsilon$
  - $B \rightarrow \epsilon$
- (b) Explain the working of direct linking loader with the help of flowchart. 10
3. (a) Explain the different databases used by two pass assembler. 10
- (b) Describe LEX tool with suitable example. 5
- (c) What is left recursion? Eliminate left recursion from the following grammar: 5
  - $S \rightarrow Aa \mid b$
  - $A \rightarrow Ac \mid Sd \mid \epsilon$
4. (a) Explain conditional macro processing with suitable example. 10
- (b) What is an activation record? Explain with suitable diagram, purpose of different fields in activation record. 10
5. (a) Explain dynamic linking and loading. 5
- (b) What is the role of finite automata in compiler design? 5
- (c) What are different types of intermediate codes? Explain their implementation techniques. 10
6. (a) Explain different phases of compiler and show the processing of following statement by every phase of compiler: 10
  - $a := b - c * 60$
- (b) Explain code optimization techniques in compiler with suitable examples. 10
7. Write short notes on (any Two) – 20
  - (a) Linkage editor
  - (b) Run time storage organization
  - (c) Syntax-directed translation
  - (d) SPARC Assembler