

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 7836

L

Unique Paper Code : 6333490010

Name of the Paper : ADVANCED COMPILER DESIGN

Name of the Course : B.VOC WEB DESIGNING – DSC

Semester : VIII

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question No. 1 is compulsory in **Section-A**.
3. Attempt any **four** questions from **Section-B**.
4. Parts of a question should be attempted together.

Section A

- Q1. (a) Define "Left Factoring" and explain why it is used in parsing. 3
- (b) What is a Parse Tree? Differentiate it from an Abstract Syntax Tree. 3
- (c) What are the common conflicts that occur during shift-reduce parsing? (p. 2) 3
- (d) Explain the concept of "Error Recovery" in bottom-up parsing 3
- (e) Define Three-Address Code and provide a simple example of its structure. 3
- (f) Briefly explain the purpose of generating intermediate code representations. 3
- (g) Explain the role of a Symbol Table in a compiler. 3
- (h) What is an "Activation Record"? Relate it to storage organization. 3
- (i) What is Peephole Optimization? Provide two examples of improvements it can make. 3
- (j) Explain the importance of Register Allocation in the code generation phase. 3

Section B

- Q2. (a) Define a Compiler and an Interpreter. Compare them in detail, highlighting their advantages, disadvantages, and execution speeds. 8

P.T.O.

- (b) What is Ambiguity in grammar? Prove that the expression grammar $E \rightarrow E + E / E * E / id$ is ambiguous and explain how to resolve it. 7
- Q3. (a) Define Handles and Handle Pruning, and illustrate how a shift-reduce parser identifies a handle using a step-by-step example. 8
- (b) Construct the FIRST and FOLLOW sets for the following grammar: 7
- $S \rightarrow A$
 $A \rightarrow aB \mid \epsilon$
 $B \rightarrow bC$
 $C \rightarrow c \mid \epsilon$
- Q4. (a) Define Symbol table. Explain different types of Data structure for symbol table 8
- (b) Draw the format of Activation Record in stack allocation and explain each field in it. 7
- Q5. (a) Given the following grammar: 8
- $A \rightarrow A d \mid A e \mid b d \mid b c$
 i) Show that the grammar contains left recursion and eliminate it.
 ii) After removing left recursion, perform left factoring.
- (b) Perform Shift Reduce Parsing for the following 7
- i) $S \rightarrow (L) \mid a \mid L \rightarrow L, S \mid S$ input string- (a,(a,a))
 ii) $E \rightarrow E + E / E * E / (E) / id$ input string- (id*id+id)
- Q6. (a) Explain optimization techniques on Basic Blocks with simple examples? 8
- (b) Explain Storage allocation strategies with suitable examples? 7
- Q7. (a) Explain Polish Notations 5
- (b) Abstract Syntax Tree 5
- (c) Directed Acyclic Graph 5