

III B. Tech I Semester Supplementary Examinations, May/June -2024
COMPILER DESIGN

(Com to CSE(AIML),CSE(AI),CSE(DS),CSE(AIDS),AIDS,AIML,CSD)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) Demonstrate the diagrammatic representation of a language processing system. [7M]
 b) Classify the phases of Compiler? Outline the output of each phase for the expression `position := initial + rate * 60;` [7M]
 (OR)
2. a) Elaborate specification and recognition of tokens. [7M]
 b) Translate the following regular expression $((00)^*(11) + 01)^*$ into an NFA. [7M]

UNIT-II

3. a) Apply the FIRST and FOLLOW function rules for the following grammar: [7M]
 $E \rightarrow TE'$
 $E' \rightarrow +TE' \mid \epsilon$
 $T \rightarrow FT'$
 $T' \rightarrow *FT' \mid \epsilon$
 $F \rightarrow (E) \mid id$
 b) Create the LL (1) parsing table for the following grammar. [7M]
 $S \rightarrow F$
 $S \rightarrow (S+F)$
 $F \rightarrow a$
 (OR)
4. a) Illustrate the various actions performed by shift-reduce parsers with an example. [7M]
 b) Justify the following grammar is LR (1) but not LALR (1). [7M]
 $S \rightarrow AalbAcIbClbBa$
 $A \rightarrow d$
 $B \rightarrow d$

UNIT-III

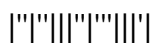
5. a) Explain about bottom-up evaluation S-Attributed definitions with an example. [7M]
 b) Evaluate the expressions for the SDD annotated parse tree for the follow expressions. [7M]
 i. $3 * 5 + 4n$
 ii. $3 * 5$ using
 (OR)
6. a) List the rules for constructing a syntax tree? Construct a syntax tree for the following expression: $a * (b + c) - d / 2$. [7M]
 b) Explain the specification of simple type checker for statements, expressions and functions. [7M]

UNIT-IV

7. a) Compare and contrast of static, stack and heap storage allocation strategies. [7M]
 b) Explain the data structure used for implementing Symbol Table. [7M]

(OR)

1 of 2



8. a) Importance of a flow graph? Build a flow graph for the following code. [7M]
i=1; sum=0;
while (i<=10)
{
sum+=i;
i++;
}
- b) Categorize the objectives of peephole optimization? Explain the different techniques used in peephole optimization. [7M]

UNIT-V

9. a) Illustrate the machine dependent code optimization. [7M]
b) Create the three-address code for the following program fragment? [7M]
while (A<C and B>D) do
if A=1 then C=C+1
else
while A<=D do
A=A+B

(OR)

10. a) Demonstrate the register descriptor and address descriptor with examples. [7M]
b) Explain how do you calculate the cost of an instruction? Measure the total cost of the following target code. [7M]
MOV a, R0
ADD b, R0
MOV C, R0
ADD R0,R1
MOV R1,X

