Code No: R2031421 **R20** SET - 1

III B. Tech I Semester Supplementary Examinations, JULY -2023
COMPILER DESIGN
(Comm to. CSE (AIML), CSE (AI), CSE (DS), CSE (AIDS), AIDS, AIML)
Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
*****

UNIT-I

1. a) List the phases of compiler? Demonstrate the Analysis and Synthesis Model of Compiler. [7M]
   b) Explain the concept of bootstrapping with an example. [7M]

(OR)

2. a) Construct the transition diagram for relational operators and unsigned numbers. [7M]
   b) Show the structure of LEX program and Demonstrate the usage of LEX in Lexical Analyzer Generator. [7M]

UNIT-II

3. a) Justify the following grammar is ambiguous and Eliminate the ambiguity. [7M]
   $S \rightarrow i\ C\ t\ S$
   $S \rightarrow i\ C\ t\ S\ e\ S$
   $S \rightarrow a$
   $C \rightarrow b$
   b) Show that the following grammar is LL (1) or not. [7M]
   $S \rightarrow AaAb \mid BbBa$
   $A \rightarrow \epsilon$
   $B \rightarrow \epsilon$

(OR)

4. a) Identify the conflicts that may occur during shift reduce parsing with an example. [7M]
   b) Construct SLR parsing table for the following grammar. [7M]
   $E \rightarrow E + T / T$
   $T \rightarrow T * F / F$
   $F \rightarrow (E) / a$

UNIT-III

5. a) Explain the method of generating syntax directed definition for control Statements? [7M]
   b) Test whether the following semantic rules are L-attribute or not? [7M]
   A.s = B.b;
   B.i = f(C.c,A.s)

(OR)

6. a) Translate the expression **-(a+b)*(c+d)+(a+b+c)** into quadruples, triples and indirect triples? [7M]
   b) Elaborate the back patching with an example? [7M]

|''|'||||''|''|||'|

UNIT-IV

7. a) List the advantages and disadvantages of stack and heap storage allocation strategies for strings and records. [7M]
   b) Identify the various ways of calling procedures? Explain in detail. [7M]

(OR)

8. a) Illustrate the principle sources of optimization in detail. [7M]
   b) Construct the DAG for the following Basic block & explain it. [7M]
   1. t1: = 4 * i
   2. t2:= a [t1]
   3. t3: = 4 * i
   4. t4:= b [t3]
   5. t5:=t2*t4
   6. t6:=Prod+t5
   7. Prod:=t6
   8. t7:=i+1
   9. i:= t7
   10. if i<= 20 goto (1).

UNIT-V

9. a) Explain the issues in design of code generation with an example. [7M]
   b) Develop the code sequence for the statement **d :=(a-b) + (a-c) + (a-c).** [7M]

(OR)

10. a) Classify the various data structures for the simple code generator algorithm. [7M]
    b) Examine the basic block of following 3-address instructions and Write the next-use information for each line of the basic block. [7M]
    a:=b+c
    x:=a+b
    b:=a-d
    c:=b+c
    d=a-d
    y=a-d

|''|'||||''|''|||'|