Hall Ticket No | | | | | | | | | | | Course Code: ACSC40

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

B TECH V SEMESTER CIE–II EXAMINATIONS, FEBRUARY– 2024

Regulation: UG20

COMPILER DESIGN

Time: 2 Hours **(COMMON TO CSE | CSE(AI&ML) | CSIT | IT)** **Max Marks: 20**

Answer any FOUR questions
All parts of the question must be answered in one place only

1. (a) Write the short note on: i) Abstract syntax tree ii) Polish notation iii) Three address code [BL: Understand| CO: 4|Marks: 2]

   (b) For the given expression generate different kinds of three-address codes and explain the storage requirements of each:
   A=b/c+d*s-60%r-h. [BL: Apply | CO: 4|Marks: 3]

2. (a) List the different types of type checking. Describe in detail type conversion with suitable examples. [BL: Understand| CO: 5|Marks: 2]

   (b) Discuss about variable length data on stack with neat diagram. Differentiate explicit and implicit allocation of memory, [BL: Apply | CO: 5|Marks: 3]

3. (a) Explain various storage allocation strategies with its merits and demerits. [BL: Understand| CO: 5|Marks: 2]

   (b) Suppose that the type of each identifier is a sub range of integers, for expressions with operators +, -, *, div and mod, as in Pascal. Explain type- checking rules that assign to each sub expression the sub range its value must lie in? [BL: Apply | CO: 5|Marks: 3]

4. (a) Summarize about different principal sources of optimization techniques with suitable examples. [BL: Understand| CO: 6|Marks: 2]

   (b) What is DAG? Construct DAG for the following basic block.
   D: = B*C;
   E:= A+B;
   B:=B+C;
   A:=E-D; [BL: Apply | CO: 6|Marks: 3]

5. (a) Write a code generation algorithm. Explain about the descriptor and function getreg(). Give an example. [BL: Understand| CO: 6|Marks: 2]

   (b) Consider the following basic block of 3-address instructions .Construct target code for the source language statement and finds its cost.
   a := b + c x := a + b
   b := a- d c := b + c
   d := a -d y := a -d [BL: Apply | CO: 6|Marks: 3]