III B. Tech I Semester Supplementary Examinations, February-2022
COMPILER DESIGN
(Computer Science and Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A   (14 Marks)

1. a) Differentiate Compiler and Interpreter. [2M]

    b) Explain the concept of ambiguity. [2M]

    c) Differentiate inherited and synthesized attributes. [2M]

    d) Explain the role of intermediate code generator in compilation process. [3M]

    e) Explain issues in the design of a code generator. [3M]

    f) Define global common sub expression. [2M]

PART –B   (56 Marks)

2. Explain the various phases of compiler with neat diagram. [14M]

3. a) What is shift-reduce parser? Consider the following grammar: [7M]
    $$E \rightarrow E - E \mid E * E \mid id$$
    Perform shift-reduce parsing of the input string
    $$id1 - id2 * id3$$

    b) Define left recursive and eliminate left recursion for the following [7M]
    grammar:
    $$S \rightarrow Aa \mid b$$
    $$A \rightarrow Ac \mid Sd \mid \varepsilon$$

4. a) Construct the LALR parsing table for the grammar G [8M]
    $$S \rightarrow L = R \mid R$$
    $$L \rightarrow * R \mid id$$
    $$R \rightarrow L$$

    b) Define syntax directed transactions and perform the evaluation [6M]
    order of SDTS.

5. a) Explain type checking and type conversions with examples. [7M]

    b) Generate the three address code for $a = b * -c + b * -c$. [7M]

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6. a) Compare static and stack allocations. [7M]

  b) Construct basic blocks, data flow graph for the following: [7M]
$$for\ (i = 1\ to\ n)$$
$${}$$
$$\{$$
$$j = 1;$$
$$while\ (j <= n)$$
$$\{$$
$$A = B * C/D;$$
$$j = j + 1;$$
$$\}\}$$

7. a) Explain how code motion and strength reduction is used for loop optimization. [7M]

  b) Explain about the method of computing transfer equations for reaching definitions. [7M]

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