

III B. Tech I Semester Supplementary Examinations, August - 2021**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. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A**(22 Marks)**

1. a) What are the differences between a compiler and an interpreter? [3M]
- b) List the rules for computing FOLLOW SET. [4M]
- c) Differentiate between SLR, LALR and CLR parsers. [4M]
- d) Write the three-address code for a while-do statement. [4M]
- e) Define Basic Block. [4M]
- f) Discuss about common sub expression elimination. [3M]

PART -B**(48 Marks)**

2. a) What are the various phases of Compiler? Explain the functions of each phase with its input and output for the example statement $A=X*Y$. [8M]
- b) Construct a transition diagram to recognize all the relational operators and real numbers with exponential. [8M]
3. a) Write the steps to remove left recursion and design LL(1) predictive parser for the grammar: $E \rightarrow E+E \mid E-E \mid E^*E \mid E \setminus E \mid (E) \mid id$. [8M]
- b) Define Context Free Grammar. Explain how it is suitable for parsing? [8M]
4. a) Design LALR(1) parser for the following grammar: [8M]
 $S \rightarrow aAd \mid bBd \mid aBc \mid bAc$ $A \rightarrow \epsilon$ $B \rightarrow \epsilon$
 where a, b, c, d, e are terminals.
- b) Write a short note on error recovery with LR parsers. How it is different from LL parsers? [8M]
5. a) Generate syntax directed translator scheme for the given Grammar: [8M]
 $L \rightarrow En$, $E \rightarrow E+T/T$, $T \rightarrow (T/F)/F$, $F \rightarrow (E)/num$.
- b) Give Three-Address Code and its quadruple, triple representation for the assignment: $a = b * - c + b * - c$. [8M]
6. a) Discuss the advantages and disadvantages of heap storage allocation strategy. [8M]
- b) Write the algorithm for a simple code generator. And explain various issues that affect the efficiency of generated code. [8M]
7. a) Explain the algebraic transformations of local machine independent optimization. [8M]
- b) Discuss about the following: i) Copy propagation; ii) Dead code elimination. [8M]
