



Roll No:

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B TECH
(SEM-V) THEORY EXAMINATION 2020-21
COMPILER DESIGN

Time: 3 Hours

Total Marks: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief.

2 x 10 = 20

| Qno. | Question | Marks | CO |
|------|--|-------|-----|
| a. | Differentiate between compiler and interpreter. | 2 | CO1 |
| b. | What is the difference between pass and phase? | 2 | CO1 |
| c. | Discuss the need to eliminate Left Recursion. | 2 | CO2 |
| d. | What is parsing? Explain parse tree. | 2 | CO2 |
| e. | Name different types of intermediate codes forms. | 2 | CO3 |
| f. | Describe how addressing modes can be used for reducing the memory access time? | 2 | CO3 |
| g. | Differentiate synthesis and inherited translation. | 2 | CO4 |
| h. | What is meant by handle pruning? | 2 | CO4 |
| i. | Describe loop unrolling and loop jamming. | 2 | CO5 |
| j. | Discuss various issues to be considered during code generation? | 2 | CO5 |

SECTION B

2. Attempt any three of the following:

3 x 10 = 30

| | | | |
|----|---|----|-----|
| a. | Explain in detail the various phases of compilers with neat diagram. | 10 | CO1 |
| b. | What is parser? Explain different parsing techniques and differentiate them. | 10 | CO2 |
| c. | Write SDT translation for switch statement. | 10 | CO3 |
| d. | What is meant by activation of procedure? How it can be represented with activation tree and record? Explain with quick sort example. | 10 | CO4 |
| e. | What is DAG? Construct a DAG for the following expression: $a+a*(b-c) + (b-c)*d$ | 10 | CO5 |

SECTION C

3. Attempt any one part of the following:

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|----|---|----|-----|
| a. | How do you specify the token? Differentiate token, lexeme, and pattern with suitable examples. And draw transition diagrams also. | 10 | CO1 |
| b. | Construct an NFA for the following regular expression: $R=(a+b)*abb$ Also convert same into DFA | 10 | CO1 |

4. Attempt any one part of the following:

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|----|--|----|-----|
| a. | State and explain the rules used to compute first and follow functions with the help of $S \rightarrow XS DS \epsilon, X \rightarrow Y Zb aY, Y \rightarrow cZ, Z \rightarrow \epsilon$ | 10 | CO2 |
| b. | Test whether the grammar is LL (1) or not, and construct a predictive parsing table for following grammar: $S \rightarrow iEtSS_1 / a, S_1 \rightarrow \epsilon S / \epsilon, E \rightarrow b$ | 10 | CO2 |

5. Attempt any one part of the following:

| | | | |
|----|---|----|-----|
| a. | Construct CLR parse table for $S \rightarrow AA, A \rightarrow aA d$ | 10 | CO3 |
| b. | Convert the following statements into the Quadruple, Triple, and Indirect triple representation: $P = -Q * (R + S)$ | 10 | CO3 |

6. Attempt any one part of the following:

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|----|--|----|-----|
| a. | What are the contents of a symbol table? Explain in detail the symbol table organization for Block-Structured languages. | 10 | CO4 |
| b. | Discuss the process of error recovery in LR parsing | 10 | CO4 |

7. Attempt any one part of the following:

| | | | |
|----|---|----|-----|
| a. | What is machine dependent optimization? Explain how peephole techniques functions in this? | 10 | CO5 |
| b. | Describe the procedure to generate object code for $X=Y+Z*15$ through different phases of compiler? | 10 | CO5 |