

Reg. No: 

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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech III Year I Semester Regular Examinations Feb-2021**  
**COMPILER DESIGN**

(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 60

**PART-A**

(Answer all the Questions 5 x 2 = 10 Marks)

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|----------|--|-----------|--------------------------------------|-----------|----------|-------------------------|-----------|----------|----------------------------|-----------|----------|--------------------------------|-----------|----------|-------------------------------|-----------|--|
| <b>1</b> | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>a</b></td> <td>Define the Role of Lexical Analyzer.</td> <td style="text-align: right;"><b>2M</b></td> </tr> <tr> <td><b>b</b></td> <td>What is Role of Parser?</td> <td style="text-align: right;"><b>2M</b></td> </tr> <tr> <td><b>c</b></td> <td>What is bottom up parsing?</td> <td style="text-align: right;"><b>2M</b></td> </tr> <tr> <td><b>d</b></td> <td>Define rules for type checking</td> <td style="text-align: right;"><b>2M</b></td> </tr> <tr> <td><b>e</b></td> <td>Give the applications of DAG.</td> <td style="text-align: right;"><b>2M</b></td> </tr> </table> | <b>a</b>  | Define the Role of Lexical Analyzer. | <b>2M</b> | <b>b</b> | What is Role of Parser? | <b>2M</b> | <b>c</b> | What is bottom up parsing? | <b>2M</b> | <b>d</b> | Define rules for type checking | <b>2M</b> | <b>e</b> | Give the applications of DAG. | <b>2M</b> |  |
| <b>a</b> | Define the Role of Lexical Analyzer.   | <b>2M</b> |                                      |           |          |                         |           |          |                            |           |          |                                |           |          |                               |           |  |
| <b>b</b> | What is Role of Parser?  | <b>2M</b> |                                      |           |          |                         |           |          |                            |           |          |                                |           |          |                               |           |  |
| <b>c</b> | What is bottom up parsing?   | <b>2M</b> |                                      |           |          |                         |           |          |                            |           |          |                                |           |          |                               |           |  |
| <b>d</b> | Define rules for type checking   | <b>2M</b> |                                      |           |          |                         |           |          |                            |           |          |                                |           |          |                               |           |  |
| <b>e</b> | Give the applications of DAG.  | <b>2M</b> |                                      |           |          |                         |           |          |                            |           |          |                                |           |          |                               |           |  |

**PART-B**

(Answer all Five Units 5 x 10 = 50 Marks)

**UNIT-I**

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|----------|--------------------------------------|------------|
| <b>2</b> | Explain LEX Tool with a Lex Program. | <b>10M</b> |
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**OR**

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|----------|--|-----------|---|-----------|----------|-----------------------------|-----------|--|
| <b>3</b> | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>a</b></td> <td>Write short notes :<br/>Application of compiler technology</td> <td style="text-align: right; vertical-align: top;"><b>5M</b></td> </tr> <tr> <td><b>b</b></td> <td>Compiler construction Tools</td> <td style="text-align: right; vertical-align: top;"><b>5M</b></td> </tr> </table> | <b>a</b>  | Write short notes :<br>Application of compiler technology | <b>5M</b> | <b>b</b> | Compiler construction Tools | <b>5M</b> |  |
| <b>a</b> | Write short notes :<br>Application of compiler technology  | <b>5M</b> |   |           |          |                             |           |  |
| <b>b</b> | Compiler construction Tools  | <b>5M</b> |   |           |          |                             |           |  |

**UNIT-II**

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|----------|--|-----------|---|-----------|----------|---|-----------|--|
| <b>4</b> | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>a</b></td> <td>Calculate FIRST and FOLLOW for the following grammar?<br/>E-&gt; E+T/T<br/>T-&gt; T*F/F<br/>F-&gt; (E)/id</td> <td style="text-align: right; vertical-align: top;"><b>5M</b></td> </tr> <tr> <td><b>b</b></td> <td>S-&gt;xABC<br/>A-&gt;a bbD<br/>B-&gt;a ε<br/>C-&gt;b ε<br/>D-&gt;c ε</td> <td style="text-align: right; vertical-align: top;"><b>5M</b></td> </tr> </table> | <b>a</b>  | Calculate FIRST and FOLLOW for the following grammar?<br>E-> E+T/T<br>T-> T*F/F<br>F-> (E)/id | <b>5M</b> | <b>b</b> | S->xABC<br>A->a bbD<br>B->a ε<br>C->b ε<br>D->c ε | <b>5M</b> |  |
| <b>a</b> | Calculate FIRST and FOLLOW for the following grammar?<br>E-> E+T/T<br>T-> T*F/F<br>F-> (E)/id  | <b>5M</b> |   |           |          |   |           |  |
| <b>b</b> | S->xABC<br>A->a bbD<br>B->a ε<br>C->b ε<br>D->c ε  | <b>5M</b> |   |           |          |   |           |  |

**OR**

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| <b>5</b> | Explain Error recovery in predictive parsing with an Example. | <b>10M</b> |
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**UNIT-III**

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| <b>6</b> | Construct CLR Parsing table for the given grammar<br>S->CC<br>C->aC/d | <b>10M</b> |
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**OR**

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| <b>7</b> | Discuss Type Checking with suitable examples? | <b>10M</b> |
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**UNIT-IV**

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|----------|---|-----------|-------------------------------------|-----------|----------|---|-----------|--|
| <b>8</b> | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>a</b></td> <td>Discuss about symbol table entries?</td> <td style="text-align: right; vertical-align: top;"><b>6M</b></td> </tr> <tr> <td><b>b</b></td> <td>Write about operations on symbol table?</td> <td style="text-align: right; vertical-align: top;"><b>4M</b></td> </tr> </table> | <b>a</b>  | Discuss about symbol table entries? | <b>6M</b> | <b>b</b> | Write about operations on symbol table? | <b>4M</b> |  |
| <b>a</b> | Discuss about symbol table entries?   | <b>6M</b> |                                     |           |          |   |           |  |
| <b>b</b> | Write about operations on symbol table?   | <b>4M</b> |                                     |           |          |   |           |  |

**OR**

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| <b>9</b> | Discuss Storage allocation strategies with suitable examples? | <b>10M</b> |
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**UNIT-V**

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|-----------|--|-----------|--|-----------|----------|---|-----------|--|
| <b>10</b> | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>a</b></td> <td>Discuss the various strategies in register allocation.</td> <td style="text-align: right; vertical-align: top;"><b>5M</b></td> </tr> <tr> <td><b>b</b></td> <td>Write about loop optimization techniques?</td> <td style="text-align: right; vertical-align: top;"><b>5M</b></td> </tr> </table> | <b>a</b>  | Discuss the various strategies in register allocation. | <b>5M</b> | <b>b</b> | Write about loop optimization techniques? | <b>5M</b> |  |
| <b>a</b>  | Discuss the various strategies in register allocation.   | <b>5M</b> |  |           |          |   |           |  |
| <b>b</b>  | Write about loop optimization techniques?  | <b>5M</b> |  |           |          |   |           |  |

OR

11 Construct the DAG for the following basic blocks

10M

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  $i \leq 20$  goto 1

\*\*\*END\*\*\*