



**SCHOOL OF COMPUTER SCIENCE AND ENGINEERING**  
**CONTINUOUS ASSESSMENT TEST - I**  
**FALL SEMESTER 2025-2026**

**Programme Name & Branch** : B. Tech CSE  
**Course Code and Course Name** : BCSE307L – Compiler Design  
**Faculty Name(s)** : Prof. Sathya K  
**Class Number(s)** : VL2025260104779  
**Date of Examination** : 21. 08. 2025  
**Exam Duration** : 90 minutes **Maximum Marks: 50**

**General instruction(s):** Answer All Questions

**Course Outcomes:**

CO1: Apply the skills on devising, selecting, and using tools and techniques towards compiler Design

CO2: Develop language specifications using context free grammars (CFG).

CO3: Apply the ideas, the techniques, and the knowledge acquired for the purpose of developing software systems.

Q. No	Question	M	CO	BL
1.	Given a code snippet <pre>int gcd(int a, int b) {   while (a != b)   {     if (a &gt; b)       a = b;     else       b = a;   }   return a; }</pre> Trace and explain the different phases of the compiler that process this code during compilation	10	CO1	BL3
2.	a) Convert the given regular expression $a + (ab)^*$ to Deterministic Finite Automata using direct method.	7		
	b) Write regular definitions for your course code and assume a valid course code must follow the given below set of rules. <ol style="list-style-type: none"> <li>i. The course code must begin with four uppercase letters (A-Z), representing the department code.</li> <li>ii. This must be followed by a three-digit number (0-9), representing the course number.</li> <li>iii. The course code must end with a single uppercase letter, denoting the course type (e.g., 'L' for Lecture, 'P' for Practical)</li> </ol>	3	CO1	BL3



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3.	<p>Consider the following grammar with four terminals: =, +, *, int</p> <p><math>S \rightarrow B + B</math>  <math>A \rightarrow *</math>  <math>B \rightarrow \epsilon</math>  <math>B \rightarrow \text{int } B B</math>  <math>B \rightarrow A =</math></p> <p>Construct LL (1) predictive parsing table for the given grammar. Illustrate the LL (1) string parsing procedure for the given string <math>w = \text{int} + \text{int} = \\$</math></p>	10	CO2	BL3
4.	<p>a) Consider the context-free grammar <math>G = (V, T, P, S)</math> with the following production rules:</p> <p><math>S \rightarrow AB</math>  <math>A \rightarrow aAc \mid c</math>  <math>B \rightarrow dB \mid e</math></p> <p>i. Identify all possible handles during the bottom-up parsing of the string "aaccdde".</p> <p>ii. Perform the handle pruning process step by step using a shift-reduce parser.</p> <p>b) Consider the given grammar</p> <p><math>\text{STMT} \rightarrow \text{if } \text{EXPR} \text{ then } \text{STMT} \mid \text{if } \text{EXPR} \text{ then } \text{STMT} \text{ else } \text{STMT} \mid s1 \mid s2</math>  <math>\text{EXPR} \rightarrow e1 \mid e2</math></p> <p>i. Draw parse tree(s) for the following input: "if e1 then if e2 then s1 else s2"</p> <p>ii. Is this grammar ambiguous?</p>	5	CO2	BL3
5.	<p>Consider the given grammar</p> <p><math>S \rightarrow L=R</math>  <math>S \rightarrow R</math>  <math>L \rightarrow *R</math>  <math>L \rightarrow \text{id}</math>  <math>R \rightarrow L</math></p> <p>Find the LR (0) items and construct the SLR parsing table.</p>	10	CO3	BL3

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