Seat No: ..... **Enrollment No: .....**

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech/Int. B.Tech, Summer 2024-25 Examination

Semester: VI/X **Date: 10-04-2025**
Subject Code: 303105349 **Time: 2.00 pm to 4.30 pm**
Subject Name: Compiler Design (Semester- 6,10) **Total Marks: 60**

Instructions:

1. This question paper comprises of two sections. Write answer of both the sections in separate answer books.
2. From Section A, **Q.1** is compulsory, From Section B, **Q.1** is compulsory.
3. Figures to the right indicate full marks
4. Draw neat and clean drawings & Make suitable assumptions wherever necessary.
5. Start new question on new page.
6. BT- Blooms Taxonomy Levels – Remember-1, Understand -2, Apply-3, Analyse-4, Evaluate-5, Create-6

SECTION - A

Q.1	Answer the following questions.	**Marks**	**CO**	**BT**
	A. Perform shift-reduce parsing on the input "id * id + id" for the grammar: E → E + E E → E * E E → id Compute the FIRST sets for all non-terminals Compute the FOLLOW sets for all non-terminals. Construct the parsing table & parse the given string	06	CO3	BT3
	B. 1. What is the role of FIRST and FOLLOW sets in predictive parsing? 2. How does the FIRST set help in constructing an LL(1) parsing table? 3. How does the FOLLOW set contribute to the construction of an LL(1) parsing table?	06	CO1	BT2
Q.2	A. Compare Synthesized and Inherited Attributes in detail.	04	CO1	BT4
	B. In what way does LEX handle errors in token recognition? Explain how errors are reported and handled in LEX programs.	05	CO2	BT2
	OR			
	B. Explain the role of Backus-Naur Form (BNF) in defining programming language grammars with an example.	05	CO2	BT2
Q.3	A. What is a parser? Explain its role in the compilation process.	04	CO2	BT2
	B. What is lexical analysis? Explain its role in the compilation process.	05	CO2	BT1
	OR			
	B. Provide an example of an L-Attributed SDD for variable declaration and type checking.	05	CO1	BT2

SECTION - B

Q.1	Answer the following questions.	**Marks**	**CO**	**BT**
	A.	06	CO2	BT3

	1. How does an Intermediate Representation (IR) enable effective code optimization? 2. What key transformations improve compiler performance? 3. Give Example			
	B. How does a compiler enforce type checking for structure members to three following points 1. Ensure correct access 2. Alignment 3. Type consistency	06	CO3	BT2
Q.2	A. What is dynamic scoping, and how does it affect memory allocation?	04	CO2	BT2
	B. What are the different types of machine-independent code optimizations?	05	CO4	BT3
	OR			
	B. How does semantic analysis handle type coercion and type conversion?	05	CO4	BT2
Q.3	A. What is the difference between local and global code optimization?	04	CO3	BT2
	B. How does a lexical analyzer handle errors? Explain different types of lexical errors.	05	CO1	BT3
	OR			
	B. What is YACC? Explain its purpose in compiler design.	05	CO1	BT1