

Seat No:

Enrollment No:

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech, Summer 2024 - 2025 Examination

Semester: VI

Subject Code: I03105310

Subject Name: Compiler Design

Date: 07-04-2025

Time: 2:00pm - 4:30pm

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
	<p>A.</p> <p>Answer the following questions :</p> <p>(1) What are the key techniques used by compilers for code optimization?</p> <p>(2) How does compiler optimization improve the execution speed and efficiency of programs?</p> <p>(3) What are the differences between compile-time and run-time optimizations in performance improvement?</p>	06	CO4	BT1
	<p>B. Answer the following questions :</p> <p>(1) Write down the rules for finding FIRST of a non terminal.</p> <p>(2) Write down the rules for finding FOLLOW of a non terminal.</p> <p>(3) Write down the steps for creating LL(1) table for a given grammar.</p>	06	CO2	BT3
Q.2	A. Provide an example of an S-Attributed Syntax-Directed Definition (SDD) for expression evaluation.	04	CO2	BT2
	B. What is lexical analysis? Explain its role in the compilation process with a detailed overview.	05	CO1	BT2
	OR			
	B. Explain the differences between CFG and regular expressions when specifying programming language syntax.	05	CO2	BT4
Q.3	A. How does a compiler check the correctness of function declarations and definitions?	04	CO3	BT4
	B. Compare YACC with other parser generators like ANTLR or Bison.	05	CO2	BT3
	OR			

	B. Explain how Syntax-Directed Definitions (SDD) help in intermediate code generation in a compiler.	05	CO2	BT2
SECTION - B				
Q.1	Answer the following questions.	Marks	CO	BT
	A. Answer the following questions : (1) What is intermediate code representation? (2) What is the primary purpose of an intermediate representation (IR) in a compiler? (3) Which are the data structures in intermediate code representation?	06	CO3	BT2
	B. Answer the following questions : (1) What is left recursion? (2) What is left factoring? (3) Discuss how recursive descent parsing benefits from techniques like left recursion removal and left factoring.	06	CO2	BT3
Q.2	A. How does data-flow analysis assist in code optimization?	04	CO3	BT5
	B. Discuss the semantic rules for struct and class declarations.	05	CO2	BT4
	OR			
	B. How does intermediate code handle type conversions in assignment statements?	05	CO3	BT3
Q.3	A. Explain heap fragmentation and its impact on program performance.	04	CO4	BT2
	B. Describe the structure of an LR(0) automaton with an example.	05	CO2	BT3
	OR			
	B. What is peephole optimization? Explain with examples.	05	CO3	BT3