



Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

BTECH
(SEM V) THEORY EXAMINATION 2024-25
COMPILER DESIGN

TIME: 3 HRS**M.MARKS: 100****Note:** Attempt all Sections. In case of any missing data; choose suitably.**SECTION A****1. Attempt all questions in brief. 2 x 10 = 20**

Q no.	Question	CO	Level
a.	Discuss the role of error detection in the different phases of the compiler.	1	2
b.	Define DFA (Deterministic Finite Automaton). How is it used in lexical analysis?	1	2
c.	Explain the difference between syntax analysis and lexical analysis in a compiler.	2	2
d.	Explain how an LALR parser improves upon an LR parser.	2	2
e.	How is an intermediate code generated in the Syntax-Directed Translation process?	3	2
f.	What are the differences between quadruples and triples in Syntax-Directed Translation?	3	2
g.	What is a symbol table, and why is it used?	4	2
h.	Give examples of lexical phase errors.	4	2
i.	What are addresses in the target code, and how are they used?	5	2
j.	Describe the role of algebraic laws in code optimization.	5	2

SECTION B**2. Attempt any three of the following: 10 x 3 = 30**

a.	What is bootstrapping in the context of compiler construction? Describe how bootstrapping helps in the development of a compiler.	1	2
b.	Explain how conflicts are handled in LR parsing. What are shift-reduce conflicts and reduce-reduce conflicts?	2	3
c.	Generate the triples and quadruples for the expression $a + (b * c)$.	3	3
d.	How is scope information managed in a symbol table? Explain with example.	4	4
e.	What is the role of a code generator in a compiler? Discuss the steps involved in code generation.	5	3

SECTION C**3. Attempt any one part of the following: 10 x 1 = 10**

a.	Define Finite State Machine (FSM). How can FSMs be used to recognize regular languages in lexical analysis? Provide an example.	1	3
b.	Given the regular expression $x(y z)^*w$, construct a DFA for recognizing this pattern.	1	3

4. Attempt any one part of the following: 10 x 1 = 10

a.	What is operator precedence parsing? Discuss how an operator precedence parser handles arithmetic expressions with different operators.	2	3
b.	Using the grammar: $E \rightarrow E + T \mid T$ $T \rightarrow T * F \mid F$ $F \rightarrow (E) \mid id$ Parse the string $id + id * id$ using the shift-reduce parser.	2	3



PAPER ID-310901

Printed Page: 2 of 2

Subject Code: KIT052

Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--

BTECH
(SEM V) THEORY EXAMINATION 2024-25
COMPILER DESIGN

TIME: 3 HRS**M.MARKS: 100**

5. Attempt any one part of the following: 10 x 1 = 10

a.	Translate the Boolean expression $a \text{ AND } (b \text{ OR } c)$ into three-address code.	3	3
b.	For the expression $(a + b) * c + d * e$, generate the corresponding intermediate code using three-address code.	3	3

6. Attempt any one part of the following: 10 x 1 = 10

a.	Explain the use of hash tables for symbol tables and their advantages.	4	2
b.	Simulate variable assignments during function calls in a run-time stack.	4	3

7. Attempt any one part of the following: 10 x 1 = 10

a.	Discuss the differences between static and dynamic code generation techniques.	5	4
b.	Create a Directed Acyclic Graph (DAG) for the given expression: $(a * b) + (c * d)$.	5	3