

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VII EXAMINATION – SUMMER 2026****Subject Code:3170701****Date:22-05-2026****Subject Name:Compiler Design****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) List the cousins of compiler and explain cross-compiler.	03
	(b) Explain Indirect Left Recursion with proper example.	04
	(c) Describe the role of the symbol table in relation to the six phases of a compiler.	07
Q.2	(a) Explain input buffering methods.	03
	(b) Write the regular expression R over {0,1} or {a,b}: 1) The set of all strings with even number of a's followed by an odd number of b's. 2) The set of all strings that consist of alternating 0's and 1's	04
	(c) Draw NFA from regular expression using Thomson's construction and convert it into DFA. $(a \mid b)^* a b b$.	07
	OR	
	(c) Implement the following grammar using Recursive Descent Parser. $S \rightarrow Aa \mid bAc \mid bBa$ $A \rightarrow d$ $B \rightarrow d$	07
Q.3	(a) What is an ambiguous grammar? Show that $S \rightarrow \text{if } E \text{ then } S \mid \text{if } E \text{ then } S \text{ else } S \mid \text{other}$ is an ambiguous grammar.	03
	(b) Explain Shift-Reduce parser with proper example.	04
	(c) Generate canonical parsing table for following augmented grammar. $S' \rightarrow S$ $S \rightarrow CC$ $C \rightarrow Cc/d$.	07
	OR	
Q.3	(a) Differentiate Top Down Parsing and Bottom up parsing.	03
	(b) Generate LR(0) Item set for $S \rightarrow AA$ $A \rightarrow aA \mid b$	04
	(c) Explain rules to satisfy operator grammar. Generate precedence function table for following grammar. $E \rightarrow ESE \mid id$ $S \rightarrow + \mid *$	07
Q.4	(a) What is inherited attribute? Explain with suitable example.	03
	(b) Explain error recovery strategies.	04
	(c) Translate following arithmetic expression $-(a * b) + (c + d) - (a + b + c + d)$ into 1. Quadruples	07

2. Triple
3. Indirect Triple

OR

- Q.4** (a) Write a short note on activation record. **03**
(b) Explain Peephole Optimization. **04**
(c) Give syntax directed definition for simple desk calculator. Also show annotated parse tree for $6*5+7n$. **07**
- Q.5** (a) Explain copy propagation and dead code elimination with respect to loop optimization. **03**
(b) Define a following:
1. Basic block **04**
2. Constant folding
3. Viable Prefix
(c) Describe code generator design issues. **07**
- Q.5** (a) Compare: Static v/s Dynamic Memory Allocation **03**
(b) Explain parameter passing techniques for procedure. **04**
(c) What is DAG? What are its advantages in context of optimization? How does it help in eliminating common sub expression? **07**
