

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 7 – EXAMINATION – SUMMER 2026

Subject Code: 2170701

Date: 01/06/2026

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.**

- Q.1**
- (a) Define compiler, interpreter and assembler. **03**
 - (b) What is the role of lexical analyzer? Justify your answer with example. **04**
 - (c) Explain phases of compiler with a neat diagram and suitable example. **07**
- Q.2**
- (a) Define (i) Parse tree (ii) Annotated parse tree (iii) Syntax tree. **03**
 - (b) Differentiate top down parsing and bottom up parsing. **04**
 - (c) Convert the following regular expression to DFA using subset construction method:
 $((0|1)(0|1))^* \#$ **07**
- OR**
- (c) Construct NFA for the following RE using Thomson's construction method and then convert it to DFA: $(a|b)^*abb$ **07**
- Q.3**
- (a) Explain error recovery strategies in brief. **03**
 - (b) Differentiate between synthesized and inherited attributes with example. **04**
 - (c) Construct LL(1) parsing table for $E \rightarrow E + T | T, T \rightarrow T * F | F, F \rightarrow (E) | a$ **07**
- OR**
- Q.3**
- (a) Explain S-Attributed Definitions and L-Attributed Definitions. **03**
 - (b) Explain the difference between NFA and DFA with example. **04**
 - (c) Construct LR (1) item set for following grammar. **07**
 $E \rightarrow E+T \mid T$
 $T \rightarrow T * F \mid F$
 $F \rightarrow id$
- Q.4**
- (a) What is Ambiguous Grammar? Describe with example. **03**
 - (b) Explain various parameter passing methods. **04**
 - (c) Explain various data structures used in symbol table management. **07**
- OR**
- Q.4**
- (a) Define handle and handle pruning. **03**
 - (b) Explain peephole optimization. **04**
 - (c) Explain operator precedence parsing method with example. **07**

- Q.5** (a) Differentiate LR(1) and LALR(1) parsers. **03**
(b) Explain Control Stack. **04**
(c) Write and explain the generic issues in the design of code generators. **07**

OR

- Q.5** (a) What is flow graph? Give suitable example. **03**
(b) Write a brief note on buffering techniques. **04**
(c) Explain various code optimization methods with example. **07**
