Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2021

Subject Code:2150708 **Date:14/12/2021**

Subject Name:System Programming

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)**	Explain types of grammar.	**03**
	(b)	Explain lexical analysis of language processor.	**04**
	(c)	What is Symbol table? Explain how one can organize Symbol table using Linear Data Structure?	**07**
Q.2	**(a)**	Describe the level of System Software.	**03**
	(b)	Define Following terms: 1. System Software 2. Semantic Gap 3. Specification Gap 4. Execution Gap	**04**
	(c)	Explain Left recursion, Left factoring and backtracking in top down parsing.	**07**
		OR	
	(c)	Develop an LL (1) parser table for the following grammar and Parse the string using the parsing table: (id*id) + (id*id) E->TA A->+TA| ε T->VB B->*VB|εV->id|(E)	**07**
Q.3	**(a)**	How compiler implements scope rules?	**03**
	(b)	Develop regular expression and DFAs for the following kind of strings: 1). a real number with optional integer and fraction part 2). a comment string in the C++ language.	**04**
	(c)	List various phases of a language processor. Explain roles of phases of Language Processor. Also explain symbol table.	**07**
		OR	
Q.3	**(a)**	Explain attributes of formal parameters in macro with syntax.	**03**
	(b)	Describe the use of REPT and IRP statement.	**04**
	(c)	Explain use and field of following tables of macro. KPDTAB, MDT, EVTAB, SSTAB	**07**
Q.4	**(a)**	Explain attributes of formal parameters in macro with syntax.	**03**
	(b)	Given following expression: x = -a * b + -a * b Write three address codes for the expression.	**04**
	(c)	Write operator precedence table for arithmetic operators "+", "*", "-", "/" "(", ")". Parse following expression using the table. id * (id + id)/ (id *id)	**07**
		OR	
Q.4	**(a)**	Explain following terms with suitable example. (1) Expansion time variable (2) Positional parameter	**03**

	(b)	An assembly program contains the statement X EQU Y + 25 Indicate how the EQU statement can processed if (1) Y is a back reference (2) Y is a forward reference	**04**
	(c)	List out and explain various optimizing transformations of a compiler by giving suitable examples.	**07**
Q.5	**(a)**	Explain the difference between top-down parsing and bottom-up parsing.	**03**
	(b)	Explain the Difference between Variant-I and Variant-II with example.	**04**
	(c)	Explain recursive descendent parsing algorithm.	**07**
		OR	
Q.5	**(a)**	Explain Boostrap loader.	**03**
	(b)	Explain design of an editor.	**04**
	(c)	What is interpreter? Explain pure & impure interpreters.	**07**

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