Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020

Subject Code:2150708 Date:20/01/2021

Subject Name:System Programming

Time:10:30 AM TO 12:30 PM Total Marks: 56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	**State True or False** 1. Language processing activities of an interpreter can be separated from its program execution activities. 2. A compiler uses a queue to compile nested control structures in a program. 3. Scope rule determines the accessibility of variables declared in different blocks of a program.	**03**
	(b)	Considering the following expression grammar, discuss the ambiguity in grammatical specification. <exp> ::= <id> | <exp> + <exp> | <exp> * <exp> <id> ::= a | b | c	**04**
	(c)	**Do as directed:** 1. What is the output of scanning phase of a compiler? 2. Grammar of the programming is checked at _____ phase of compiler. 3. What is the role of POOLTAB data structure in Pass-I of an assembler? 4. What is the use of value numbering in local optimization of a program? 5. Which kind of macro expansion implies generation of instruction tailored to the requirements of a specific usages? 6. If the Linked origin ≠ Translated origin, will the linker performs the relocation? 7. What is the relevance of 1 in LL (1) parser?	**07**
Q.2	**(a)**	Explain how *Reference Count* method assist memory management.	**03**
	(b)	What is left recursion? Eliminate the left recursion from the following grammar. E → E + T | T T → T * F | F F → (E) | id	**04**
	(c)	Compare and contrast recursive descent parsing with LL (1) parsing. What grammar forms are acceptable to each of these?	**07**
Q.3	**(a)**	In which situation, assembly language programming holds an edge over high level language programming?	**03**

	(b)	Justify the statement, "The use of Type-3 production (grammar) is restricted to the specification of lexical units".	**04**
	(c)	Discuss the following assembler directives with example: **a)** ORIGIN **b)** EQU	**07**
Q.4	**(a)**	What is the relevance of LITTAB and OPTAB data structure in two pass assembler?	**03**
	(b)	Discuss the need for left factoring in grammar? Explain it with suitable example.	**04**
	(c)	Compare and contrast variant-I & II of the intermediate code for imperative statements in assembler.	**07**
Q.5	**(a)**	State the limitations of stack based memory allocation model.	**03**
	(b)	What do you mean by relocatable and non relocatable programs?	**04**
	(c)	Discuss the macros with mixed parameter lists (i.e., keyword and position parameter) with example.	**07**
Q.6	**(a)**	What do you mean by Optimization Transformation?	**03**
	(b)	Discuss the role of linker and loader.	**04**
	(c)	Discuss various data structure involved in macro preprocessing with suitable example.	**07**
Q.7	**(a)**	List out the various components of an Object Module.	**03**
	(b)	Discuss the role of Profile Monitor.	**04**
	(c)	Discuss various compiler optimization techniques with example.	**07**
Q.8	**(a)**	Justify, "Indirect Triples is useful in optimizing compilers".	**03**
	(b)	Discuss the role of Debug Monitor.	**04**
	(c)	Explain in detail, how the linker resolves the external references.	**07**

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