Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2018

Subject Code:2150708 Date:20/11/2018

Subject Name:System Programming

Time: 10:30 AM TO 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Remove left recursion from following grammar A → Ac | Aad | bd | ε	**03**
	(b)	Consider a grammar S → aa | aSa, How a top down backtracking parser can generate six occurrences of a?	**04**
	(c)	Construct an LL(1) parsing table for the following grammar. S → aBDh B → cC C → bC | ε D → EF E → g | ε F → f | ε	**07**
Q.2	**(a)**	If the string a9b had been identified as identifier, but if in the further use 9ab is written, which phase of compiler would identify as an error? How?	**03**
	(b)	How a lexical analyzer recognizes unsigned numbers such as 12,12.3,12.3E4?	**04**
	(c)	Consider the assembly program fragment START 200 READ A LOOP MOVER AREG,A SUB AREG,='1' BC GT,LOOP STOP A DS 1 What will be the intermediate code for the above program fragment? What does START directive do? What will be the difference if ORIGIN directive is used in place of START?	**07**
		OR	

	(c)	Consider the assembly program fragment,
		MOVER CREG, B
		ADD CREG, ='1'
		BC ANY,NEXT
		LTORG
		='5'
		='1'
		SUB AREG,='1'
		END
		='1'
		(i) Explain LTORG directive.
			07

(ii) Explain the entries in mnemonic opcodes table as per above code fragement.

(iii) How table of literals will be manipulated?

Q.3 **(a)** Which type of gap makes the software buggy or unreliable? Which methods can be used to overcome this situation? **03**

(b) How the use of programming language can help in making the software reliable? **04**

(c) Write Macro definition with following and explain. **07**

(i) Macro using expansion time loop

(ii) Macro with REPT statment

OR

Q.3 **(a)** Write Macro definition for adding two numbers that uses positional and keyword parameters. **03**

(b) Write a macro definition for adding two numbers 10 times. Use nested macro call to increment numbers by 1 every time in 10 iterations. **04**

(c) Consider the following grammar for expressions **07**

E → EAE | (E) | -E | id

A → + | - | * | / | ^ where ^ represents exponent. Generate operator precedence relation matrix and show how id * id ^ id will be parsed?

Q.4 **(a)** Justify "Postfix string is a popular intermediate code in non optimizing compilers" **03**

(b) Which are the methods used for identifying free memory area? **04**

(c) Define program relocation. How address is corrected in address sensitive instructions in case of program relocation. **07**

OR

Q.4 **(a)** A program computes i*5 for 10 times. What type of optimization can be applied? **03**

(b) What is the structure of LEX program? **04**

(c) Explain common sub expression elimination using value numbers. **07**

Q.5 **(a)** What is ambiguity in grammatic specification? **03**

(b) Describe the facilities for dynamic debugging. **04**

(c) Write a code fragment to find out whether number is odd or even. Draw control flow graph. Perform control flow analysis. **07**

OR

Q.5 **(a)** Describe three components of the interpreter. **03**

(b) Define linking. How external reference is resolved in linking? **04**

(c) What is memory binding? Explain dynamic memory allocation using extended stack model. **07**

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