

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 $A \rightarrow Ac \mid Aad \mid bd \mid \epsilon$	03
(b) Consider a grammar $S \rightarrow aa \mid aSa$, How a top down backtracking parser can generate six occurrences of a?	04
(c) Construct an LL(1) parsing table for the following grammar. $S \rightarrow aBDh$ $B \rightarrow cC$ $C \rightarrow bC \mid \epsilon$ $D \rightarrow EF$ $E \rightarrow g \mid \epsilon$ $F \rightarrow f \mid \epsilon$	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'	07
(i) Explain LTORG directive.	

	(ii)	Explain the entries in mnemonic opcodes table as per above code fragment.	
	(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 $E \rightarrow EAE \mid (E) \mid -E \mid id$ $A \rightarrow + \mid - \mid * \mid / \mid ^$ where ^ represents exponent. Generate operator precedence relation matrix and show how $id * id ^ id$ will be parsed?	07
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
