

C BYREGOWDA INSTITUTE OF TECHNOLOGY

Department: Computer Science and Engineering

Model Question paper 2

System Software & Compiler Design (15CS63)

Duration: 03 hrs

Max Marks: 80

Note: Answer five full questions, choosing one full question from each module

Question number	Module-1	Marks
1	a) Explain the SIC/XE machine architecture in detail.	8
	b) Explain the following: SYMTABLE, LOCCTR, OPTAB	4
	c) Give the format of the following: header, text, end and modification record	4
	[OR]	
2	a) Define MACRO Briefly explain the various data structures used in the design of MACRO PROCESSOR	10
	b) Write a SIC/XE program to copy array A of 100 words to array of B of same size	6
3	Module-2	
	a) With source code, explain the working of boot-strap loader	8
	b) Explain various data structures used for a linking loader.	8
[OR]		
4	a) With the help of an example show how relocation and linking operations are performed.	8
	b) Explain briefly the design options of loaders	8
Module-3		
5	a) Write the look ahead code with sentinels for input buffering used in lexical analysis	6
	b) Construct a transition diagram for recognizing relational operators. Sketch the program segment to implement it showing the first and one final state	10
[OR]		
6	a) What is token, pattern and lexeme? Give example for each	3
	b) Write a regular definitions for i) identifier ii) unsigned number	5
	c) Explain input buffering strategy used in lexical analysis phase	8
Module-4		
7	a) Give rules for constructing FIRST and FOLLOW sets. Find FIRST and FOLLOW for the grammar $E \rightarrow E + E T$ $T \rightarrow T * F F$ $F \rightarrow (E) id$	10
	b) What is recursive decent parser? Trace and explain working of the recursive descent parser for the input "bcd" and grammar: $A \rightarrow bCd$ $C \rightarrow ce e$	6
[OR]		
8	a) Construct SLR(1) parsing table for the following grammar. $S \rightarrow CC$ $C \rightarrow cC d$ And also show the sequence of moves made by the parser on the input ccdd	8

	<p>b) Show that following grammar $S \rightarrow Aa \mid bAc \mid dc \mid bda$ $A \rightarrow d$ is LALR(1) but not SLR(1)</p>	8
Module-5		
9	a) List and explain the different common three address instruction forms	6
	b) Explain the following with example i) quadruples ii) triples iii) indirect triples iv) Static single assignment form	5
	c) What is SDD and SDT give examples	5
[OR]		
10	<p>a) Generate intermediate code for the following statements and identify the basic blocks (given $w=8$ bytes)</p> <pre> for i from 0 to 10 do for j from 0 to 10 do result = c[i,j] * d[i,j]; for i from 0 to 9 do a[i,i] = 1.0 </pre>	10
	b) Write an algorithm to partition three address instruction into basic blocks	6