Hall Ticket Number:

Code No. : 16602

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD B.E. (IT: CBCS) VI-Semester Main & Backlog Examinations, May-2019

Compiler Construction

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Q.No.	Stem of the question	Μ	L	СО	PO
	Part-A (10 × 2 = 20 Marks)		1.		
1.	Describe various lexical errors? Explain with example?	2	1	1	1
2.	What is the difference between Compiler and Interpreter?	2	1	1	2
3.	Define Context Free Grammar? Give an example	2	1	2	1
4.	What is the relationship among SLR, CLR and LALR with respect to the number of states in the transition diagram?	2	3	2	1
5.	Define S-attributed Definition with an example.	2	1	3	1
6.	What is the use of Syntax Directed Definition?	2	3	3	1
7.	Describe various principal sources of optimization?	2	2	4	1
8.	List the contents of an activation record? Give an example	2	2	4	1
9.	How to calculate the cost of an instruction? Give one example	2	3	5	1
10.	Classify the characteristics of peephole optimization?	2	2	5	1
	Part-B $(5 \times 10 = 50 \text{ Marks})$				
11.a)	Give the structure of LEX program? What is the input and output to a LEX program explain with an example	5	2	1	2
b)	Discuss the phases of the compiler with neat diagram and show the representation of each phase output by considering an example	5	2	1	2
12.a)	Give the Recursive Descent parser for the grammar: $E \rightarrow TE'$ $E' \rightarrow +TE' \mid \varepsilon$	4	3	2	2
	$T \rightarrow FT'$				
	$T \to FT' \varepsilon$				
	$F \to (E) id$	Ē			
b)	Show that the following grammar is LALR(1) but not SLR(1). $S \rightarrow Aa \mid bAc \mid dc \mid bda$	6	3	2	1
	$A \rightarrow d$				
13.a)	$E \rightarrow E + T \mid T$	6	3	3	2
	$T \rightarrow T * F F$ F \rightarrow (E) digit				
	By using SDD construct an annotated tree for the expression $(4*7+1)*2$				
b)	Translate the following assignment statements into quadruples, triples and indirect triples $a[i]=b*c-b*d$	4	4	3	2

14.a)	Distinguish garbage and Dangling pointer reference? Explain about garbage collection	4	2	2	4	2
b)	Translate the following statement to intermediate code and apply code optimization for that code. A[I,J]=B[I,J]+C[A[K,L]]+D[I+J]	6	3	3	4	2
15.a)	Give the algorithm for code generation and generate the code for the following C statements by assuming three registers. x=1 x=a+b*c/d x=a/b-d*(e+f+h)	6	2	2	5	1
b)	Discuss various issues in the design of a code generation.	4	1	2	5	1
16.a)	What is the use of Input buffering in Lexical Analysis? Explain.	4		1	1	1
b)	Consider the following grammar and construct the predictive parsing table for it. $E \rightarrow E + T \mid T$ $T \rightarrow TF \mid F$	6		3	2	2
	$F \rightarrow F^* a b$					
17.	Answer any two of the following:	lu-da				
a)	What is 3-address code? Give 3-address code for different language constructs.	5		2	3	1
b)	Explain about machine independent optimization.	5		1	4	1
c)	What is DAG? Construct syntax tree and DAG for the following expressions $((x+y)-((x+y)*(x-y)))+((x+y)*(x-y))$	5		3	5	2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	58
2	Knowledge on application and analysis (Level-3 & 4)	. 42
3	*Critical thinking and ability to design (Level-5 & 6)	
	(*wherever applicable)	1000

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