Hall Ticket Number:

Code No.: 16203

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (CSE: 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** questions from **Part-B***

Q. No	Stem of the Question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	What is the difference between lexeme, token and pattern?	2	2	1	1,2
2.	Write the regular expression have all strings of 0's and 1's with no two consecutive 0's.	2	3	1	2
3.	Differentiate between top down and bottom up parsing strategies.	2	2	2	1,2
4.	Check whether the given grammar is ambiguous or not? S -> S+S| S*S| id	2	3	2	1,2
5.	List the types of three address statements.	2	2	3	1
6.	Translate a+-(b+c) into quadruples.	2	3	3	1,2
7.	What are the functions of heap memory manager?	2	2	4	1
8.	Find the starting memory location of int a[3][4] where base address =0 and size of integer=4	2	2	4	1
9.	What is DAG? Write down its advantages.	2	2	5	1,2
10.	What is code motion? Apply code motion for the given code snippet While(i<=limit-2){ //limit value is not changing}	2	3	5	1,2
	Part-B (5 × 10 = 50 Marks)				
11.a)	Explain the phases of compilation with the following example. *Position=initial + rate*60*	6	2	1	1
b)	Construct transition diagram for unsigned numbers.	4	3	1	1,2
12.a)	Consider the following grammar. S ->Xa X ->aXb|a Check whether the given grammar is CLR or not?	4	3	2	1,2
b)	Consider the grammar : S ->aAd | bBd | aBc | bAc Construct LALR(1) parsing table for this grammar.	6	2	2	1,2
13.a)	Write three address code ,triple and indirect triple for the given expression. *(a * b) + (c + d) - (a + b + c + d)*	4	2	3	1
b)	Construct a Syntax-Directed Translation scheme that translates arithmetic expressions from infix notation into postfix notation. You should write the context-free grammar, the semantic attributes for each of the grammar symbols, and corresponding semantic rules. Explain the scheme with the given input "*4*5 + 7*2 - 2*1*".	6	3	3	1,2

Contd... 2

Code No. : 16203

14.a)	Explain the usage activation record in stack allocation strategy. How it is different from heap allocation?	4	2	4	1

b)	For the given code snippet to compute fibonacci numbers recursively:
	int f(int n) {
	int t, n;
	if(n<2) return 1;
	s = f(n-1);
	t = f(n-2);
	return s+t;
	}
	Suppose activation record of 'f' includes (return value, argument n, local s, local t); other variables may possible. If the initial call is f(5).
	i) Show the complete activation record.
	ii) Show the stack and its activation records at the instance when the first f(1) call is about to return.
		6	3	4	1,2

15.a)	What is peephole optimization? Explain peephole optimization techniques with suitable examples.	4	2	5	1
b)	Construct the DAG for the basic block: d:= b * c e:= a + b x:= b * c a:= e - d	6	3	5	1,2
16.a)	Describe different language processors.	4	2	1	1
b)	Explain the rules to remove left recursion. Remove the left recursion in the following grammar. S→ Aa | b A →Ac | Sd |b	6	3	2	1,2
17.	Answer any ***two*** of the following:				
a)	Construct syntax directed definition to build annotated parse tree for the expression (3+4)*(5+6) using expression grammar.	5	3	3	1,2
b)	Find first and follow for the given grammar. E→E+T/T T→T*F/F F→(E)/id	5	2	4	1
c)	Describe machine independent optimization techniques with suitable examples.	5	2	5	1

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)	60
2	Knowledge on application and analysis (Level-3 & 4)	40
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	-