14CS73 USN 1 NT 15CS140

NITTE MEENAKSHI INSTITUTE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTE AFFILIATED TO VTU, BELAGAVI)

December 2018 7th Semester End Examination B.E. Degree,

Computer Science and Engineering

Compiler Design (14CS73)

Duration: 3 Hrs **Max. Marks:100**

Instructions: 1. Answer one full question from each unit.
2. Any missing Data can be suitably assumed.

UNIT-I

				CO/PO ; BL
1.	a.	Show the syntax analyzer operations with examples.	08 Marks	1/3,5;3
	b.	Draw the transition diagram to recognize any 8 arithmetic operators.	08 Marks	1/3,5;2
	c.	How is Lex tool used in constructing compiler? Show with an example.	04 Marks	1/3,5;2
2.	a.	What are input buffers, used along with lexical analyzer?	05 Marks	1/3,5;2
	b.	Show any 3 different categories of errors in high level language statement. Show the ways in which compiler handles those errors.	05 Marks	1/3,5;4
	c.	Give your own arithmetic expression written in high level language. Demonstrate the compiler phases over your statement.	10 Marks	1/3,5;3

UNIT-II

3.	a.	Find the FIRST and FOLLOW for the grammar given below. E→EAT/T A→+|- T→TMF/F M→* F→ (E)|num	06 Marks	2/1,2,3,5; 5
	b.	Solve the problem of shift reduce parsing for the input string id+id*id with the grammar. E→E+E E→E*E E→(E)|id	04 Marks	2/1,2,3,5; 3
	c.	Construct the LL(1) parsing table for the given grammar. E→TE¹ E¹→+TE¹|ε T→FT¹ T¹→*FT¹|ε F→(E)|id	10 Marks	2/1,2,3,5, 6
4.	a.	Compute the set of LR(1) items and construct the CLR parsing table for the grammar given below. S→AA A→aA|b	10 Marks	2/1,2,3,5; 6
	b.	Write recursive descent parsing for the following grammar S→aAcB A→Ab|b|bc B→d	10 Marks	2/1,2,3,5; 6

UNIT-III

5.	a.	Define inherited & synthesized attributes and justify their uses.	08 Marks	3/2,3;5
	b.	Show translation of array expression and analyze it.	12 Marks	3/2,3;4
6.	a.	Produce the SDT for S→do S1 while(c)	06 Marks	3/2,3;6

	b.	Construct DAG for expression i. a=a+b+a*c+(a+b) ii. a=a+b+(a+b)	06 Marks	3/2,3;5
	c.	Write the three address code and quadruple representation for i. f=fib(n-1,n-2) ii. a=a+b*-c+b*-c	08 Marks	3/2,3;3

UNIT-IV

7.	a.	How is runtime memory arranged in code and data area? Demonstrate with a block diagram.	06 Marks	4/3,7;2
	b.	Discuss the issues in the design of code generator.	06 Marks	4/3,7;2
	c.	Describe all techniques for basic block generation and give an example for each block of them.	08 Marks	4/3,7;1
8.	a.	Provide the design of simple code generator using code generation algorithm and GetReg.	08 Marks	4/3,7;6
	b.	What are basic blocks and flow graphs? Write an algorithm for partitioning three address instructions into basic blocks.	06 Marks	4/3,7;4
	c.	Analyze the working of peephole optimization with specific examples.	06 Marks	4/3,7;4

UNIT-V

9.	a.	Explain the ways through which compiler can improve program without changing function.	10 Marks	5/1,3,5,6; 2
	b.	Discuss an algorithm for region based analysis.	10 Marks	5/1,3,5,6, 7;2
10.	a.	Explain reaching definition, data flow schema with flow graph and examples to illustrate reaching definition.	10 Marks	5/1,3,5;2
	b.	Explain region based analysis with examples.	06 Marks	5/1,3,5;2
	c.	Discuss IN and OUT sets and state their purpose.	04 Marks	5/1,3,5,6, 7;2