Reg. No. | | | | | | | | | | | | | |

B.E./ B. TECH.DEGREE EXAMINATIONS, MAY 2023

Sixth Semester

IT18602 – AUTOMATA AND COMPILER DESIGN

(Information Technology)

(Regulation2018/2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Examine the various deterministic and non-deterministic machines for a language processing system.	4
CO 2	Formulate the analysis phase of the compiler	6
CO 3	Choose the compiler construction tools for analysis and synthesis phase.	5
CO 4	Examine the various optimization techniques.	4
CO 5	Design code generators for the specified machine	6

PART- A (10x2=20Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Differentiate NFA and DFA with suitable example.	1	4
2.	Construct a NFA that accepts set of all strings that contain a) ‘01’ b)starts with ‘10’	1	4
3.	Write the regular definition and draw the transition diagram for unsigned numbers.	2	2
4.	What are the different parsing conflicts occurs in SLR parsing table?	2	1
5.	Compute the value w=2^3+4 using synthesized attribute.	3	3
6.	Mention the software tools that are used in analyzing the source program.	3	2
7.	List the various steps for partitioning the three address code into basic block.	4	1
8.	Differentiate static and stack allocation.	4	4
9.	Construct a DAG for a=b*-c + b*-c and list out the applications of DAG.	5	4
10.	Write the various characteristics of peephole optimization.	5	2

PART- B (5x 14=70Marks)

		Marks	CO	RBT LEVEL
11. (a)	Convert the regular expression (a/b)* abb (a+b) into DFA using Thompsons construction method.	(14)	1	4
	(OR)			
(b)	Convert the given NFA to its equivalent DFA using subset method.	(14)	1	4

State/Input	0	1
->p	{p,q}	{p}
q	{r}	{r}
r	{s}	θ
s	{s}	{s}

12. (a)		Explain the various phases and trace out the output of every phase of the compiler for the assignment statement a=b + c*15. Assume variables are given float type.	(14)	2	2
		(OR)			
(b)		Explain predictive parser and construct predictive parsing table for the following grammar. Show how the string (a, a) is parsed by the predictive parser? S->a | ^ | (T) T->T,S | S	(14)	2	2
13. (a)		Develop a translation scheme for performing type checking of statements and draw the annotated parse tree for the declaration float a,b,c.	(14)	3	3
		(OR)			
(b)		Develop the SDD and Translate the statement a or b and c<d and d<e into three address statements using back patching.	(14)	3	3

14. (a)	(i)	Construct the three address code for the following programming statement and convert it into basic blocks.
		Begin
		Location=-1;
		i=0;
		while(i<100) do
		begin if (a[i]= =x) then
		location=i;
		i=i+1;
		end;
		end;
			(10)	4	3

	(ii)	Explain the stack allocation strategies in detail.	(4)	4	3
		(OR)			
(b)	(i)	Construct the DAG for the statement a=b[i] and d=a+c[i].	(4)	4	3
	(ii)	Show the various sources of optimization that can be applied to the program segment.	(10)	4	3

15. (a)	**(i)**	Explain and discuss the various issues in code generation.	**(10)**	**5**	**3**
	(ii)	Develop the assembly language for the statements w=(a+b)(a+c)+(a+c).	**(4)**	**5**	**3**

(OR)

(b)	**(i)**	Explain about the peephole optimization.	**(4)**	**5**	**3**
	(ii)	Develop the code generation algorithm and explain getreg function.	**(10)**	**5**	**3**

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

			Marks	CO	RBT LEVEL
16.	**(i)**	Determine the various error recovery strategies across the compiler phases.	**(5)**	**2**	**5**
	(ii)	Determine the various language conventions among C,C++, Fortran and Java	**(5)**	**2**	**5**

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Q. Code:407400