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

SNS College of Technology, Coimbatore-35.
(Autonomous)
B.E/B.Tech- Internal Assessment -I
Academic Year 2023-2024(ODD)
Fifth Semester
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

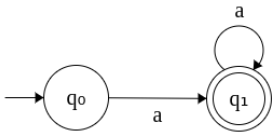
A

19CSB301 – AUTOMATA THEORY AND COMPILER DESIGN

Time: $1^{1/2}$ Hours **Maximum Marks: 50**

Answer All Questions

PART-A (5 x 2 = 10 Marks)

1.	List the types of grammar based on Chomsky Hierarchy Type 0 (unrestricted), Type 1 (context-sensitive), Type 2 (context-free), and Type 3 (regular).	CO1	REM
2.	Differentiate PDA & TM with graphical notation Pushdown Automata is a finite automata with extra memory called stack which helps Pushdown automata to recognize Context Free Languages. A Turing machine is a mathematical model of computation describing an abstract machine that manipulates symbols on a strip of tape according to a table of rules·	CO1	ANA
3.	Construct the Deterministic Finite Automata for set of strings over {a, b} which has atleast 1a 	CO1	APP
4.	Construct the Lexical & Semantic Analysis for Total= Count + Rate*10	CO2	APP
5.	Define Preprocessor A preprocessor, generally considered as a part of compiler, is a tool that produces input for compilers. It deals with macro-processing, augmentation, file inclusion, language extension, etc.	CO2	UND

PART–B (13+13+14 = 40 Marks)

6. (a) Construct the DFA & NFA for the following by their regular language and regular expression over {0,1}/{a,b}:

(i) Set of strings that begins with 0

(ii) Set of strings that begins with 0 and ends with 1

(iii) Set of strings that ends with bb

(iv) Set of strings that has at least 1 a

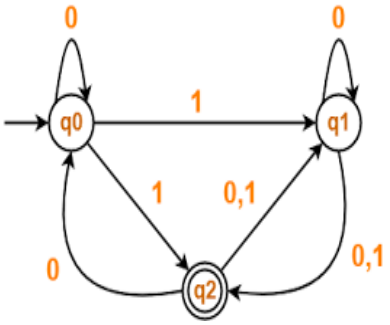
13 CO1 APP

(or)

(b) Construct the minimized DFA for the given transition table 13 CO1 APP

	0	**1**
→q_0	**q_1**	**q_5**
q_1	**q_6**	**q_2**
***q_2**	**q_0**	**q_2**
q_3	**q_2**	**q_6**
q_4	**q_7**	**q_5**
q_5	**q_2**	**q_6**
q_6	**q_6**	**q_4**
q_7	**q_6**	**q_2**

7. (a) Define Finite automata and explain on the types of finite automata and convert the following NFA to DFA

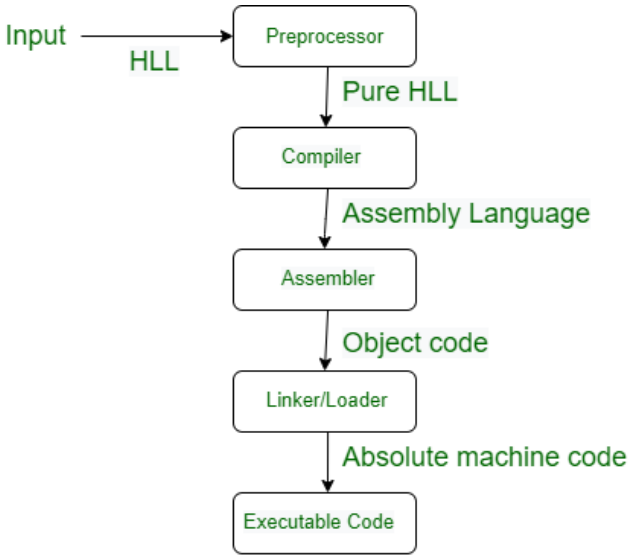


13 CO1 APP

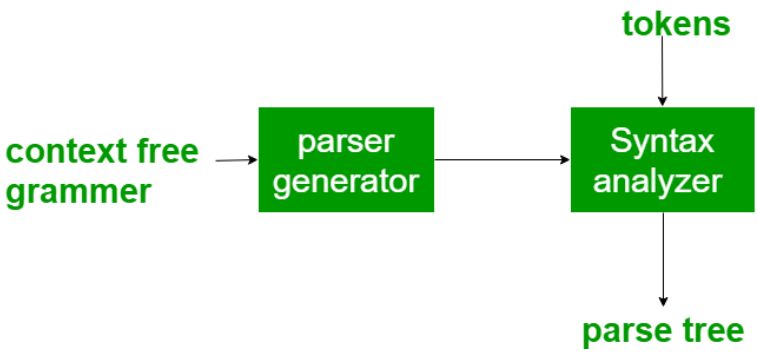
(or)

(b) Outline the following: 13 CO2 UND

(i) Language Processing System



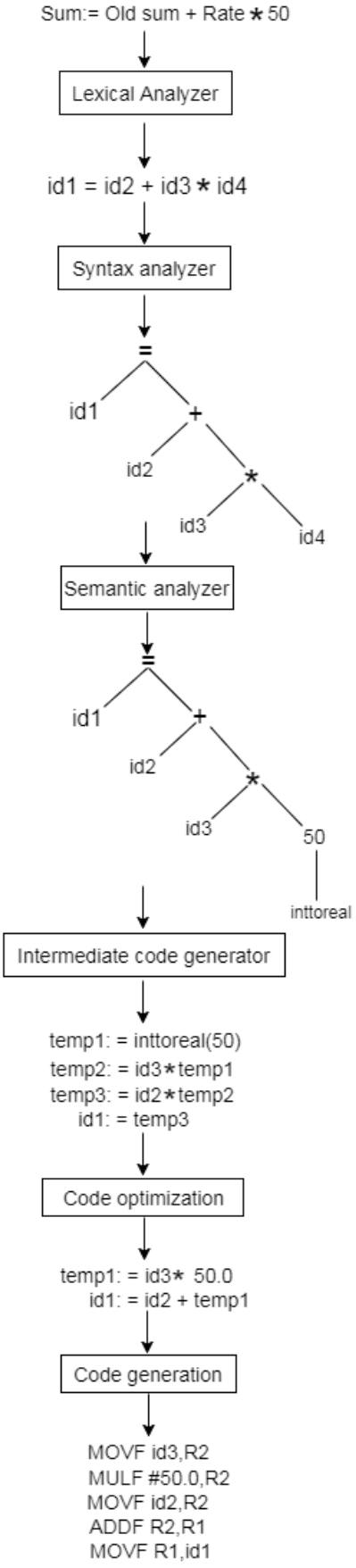
(ii) Compiler Construction Tools



8. (a) Explain how the Turing machine is more powerful than other automata with its formal and graphical representation. Construct the Turing machine for Language 01*0 | 14 | CO1 | APP

(or)

(b) Elaborate on the various phases of compiler and trace it with the program segment (position:=initial + rate * 60) 14 CO2 APP



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(Note: UND-Understand REM-Remember ANA-Analyze APP-Apply CRE-Create)

Prepared By **Verified By** **HoD**