VIT

Vellore Institute of Technology

Reg: 21BCE1771

Continuous Assessment Test 1(CAT - 1) - MAY 2023

Programme	:	B.Tech. CSE	Semester	:	**Fallintersem 2022-23**
Course Code	:	**BCSE307L**	Slot	:	**F2+TF2**
Course Title:	:	**Compiler Design**		:	
Faculty(s)	:	Dr. SURESHKUMAR, Dr. VENKATRAMAN S., Dr. MERCY RAJASELVI BEAULAH P. Dr. SUGANYA R., Dr. ASHOKA RAJAN, Dr. SRISAKTHI	Class Nos:	:	CH2022232500868 CH2022232500869 CH2022232500872 CH2022232500873 CH2022232500874 CH2022232501178
Time	:	90 Minutes	Max. Marks	:	**50**

Answer All the Questions

Q No	Question Text	Marks
1.	Provide a detailed explanation of the compilation process using the given example to demonstrate the output of each phase of compilation for the input: **d = b *(e + f) * (f+ e) * 55**	10
2.	Construct Deterministic Finite Automata for the given Regular Expression by direct DFA method. (10 Marks) **(a + b + c) (bca+ab)* (ac)* (b+ca) d*** Simulate the DFA with examples. (5 Marks)	15
3.	Develop an LL(1) parsing table for the given grammar, which consists of four non-terminals and eight terminals. The parser table will allow us to parse input strings using the LL(1) parsing technique, which involves reading input symbols from left to right, and using the parser table to decide which production rule to apply at each step. (6 Marks) **G={E -> TX, X -> +E | ε, T -> (E) | int Y, Y -> *T | ε }** Show whether the following expression will be accepted or not: **(int + int * int) + (int * int)** (4 Marks)	10
4.	Construct predictive parsing table for the grammar **{ i. S -> CMD,** **ii. CMD -> CREATE_ACCOUNT | DEPOSITLIST | WITHDRAW | CHECK_BALANCE,** **iii. CREATE_ACCOUNT -> "create" "account" "for" ID** **iv. DEPOSITLIST -> DEPOSITLIST DEPOSIT | "$$$"** **v. DEPOSIT -> "deposit" AMOUNT "into" ID** **vi. WITHDRAW -> "withdraw" AMOUNT "from" ID** **vii. CHECK_BALANCE -> "check" "balance" "of" ID** **viii. AMOUNT -> [0 – 9]+** **ix. ID -> [a – z 0-9]+ }** (10 Marks) Show whether the following commands will be accepted or not. i) **create account for john** ii) **$$$ deposit 100 into a123** (5 Marks)	15

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Continuous Assessment Test- I – August – 2024

Programme	**B.Tech**	**Semester**	**Fall Semester 2024- 25**
Course	**BCSE307L - Compiler Design**	**Slot(s) :**	**D1+TD1**
Course Faculty	**Dr. P. Mercy Rajaselvi** **Dr. Leninisha Shanmugam**	**Class Nbr**	**CH2024250102280** **CH2024250102282**
Time	**1.30 Hours**	**Max Marks**	**50**

General Instructions: Write only your registration number on the question paper in the box provided and do not write other information

Answer ALL Questions = 50 Marks

1	Demonstrate the different stages involved in the process of compilation (5marks) and display the results generated by each stage for the given input: a =((b+c)*(b+c)*2) / a+c (5marks) Where a, b, c are real numbers	**10**
2	a. Consider the following regular expression R (a|d*) (b|c)*da*(b|c) Construct a deterministic finite automaton using direct conversion method. Find nullable(), firstpos(), lastpos() and followpos() (10 marks) b. Construct €-NFA for the regular expression by using Thompson's algorithm ((a+b)*+abb) + (ab*+a*b) (5 marks)	**15**
3	Construct predictive parsing table for the following grammar G A-> A+ B | B B -> id | id [ ] | id [C] C ->A, A |A a. Eliminate left recursion in G to construct G1 with L(G1) =L(G) (2 marks) b. Perform left factoring for G1 to construct G2 with L(G2) = L(G) (2 marks) c. Compute the FIRST and FOLLOW sets for all non-terminals in G2 (4 marks) d. Build an LL(1) parse table for the grammar G2 (2 marks) e. Parse the string id+id [id+id,id[]]. Show that stack, the input and the action taken at every stage of parsing (3 marks) f. Build the parse tree while you are parsing, show your parse tree (2 marks)	**15**
4	Construct operator precedence for the following grammar: S → b | ↑ | (T) T → T , S / S a. Find Leading and trailing of each non-terminal(2.5 marks) b. Construct precedence table (2.5 marks) c. Show the action of the parser for the input (b,b) (2.5 marks) d. Perform operator precedence function (2.5 marks)	**10**

Faculty signature:

Reg. Number:	

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(Deemed to be University under section 3 of UGC Act, 1956)
CHENNAI

Continuous Assessment Test (CAT) – I FEB 2024

Programme	:	B. Tech CSE and specialization	Semester	:	Winter 2023-24
Course Code & Course Title	:	BCSE307L - Compiler Design	Slot	:	B2+TB2
Faculty	:	Dr. S. Aravindkumar Dr. R. Ashoka Rajan Dr. T. Benil Dr. B. Indira Dr. G. Manju Dr. S. V. Nagaraj Dr. T. Nathezhtha Dr. D. Selvam Dr. Srisakthi Saravanan Dr. R. Suganya Dr. WI. Sureshkumar Dr. S. Venkatraman	Class Number	:	CH2023240501795 CH2023240501796 CH2023240501804 CH2023240501443 CH2023240503468 CH2023240501801 CH2023240501807 CH2023240501784 CH2023240501798 CH2023240501805 CH2023240501803 CH2023240501800
Duration	:	1½ Hours	Max. Mark		50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.
- Use statistical tables supplied from the exam cell as necessary
- Use graph sheets supplied from the exam cell as necessary
- Only non-programmable calculator without storage is permitted

Answer all questions

Q. No	Sub Sec.	Description	Marks
1		Using phases of compiler translate the given assignment statement: **a = ((b+c)*(b+c)*2) / a + c** Where a, b, c are real numbers. **[10 Marks]**	**10**
2	a) b)	Construct NFA (with ε edges) by using Thompson's algorithm: **a(a+b)*(b+a)(b+a)*a [5Marks]** Construct a DFA for the regular expression **(a|b)*ab (a|b) (a|b)*** using direct method. ***Note***: using **nullable ( ), firstpos ( ), lastpos ( )** and **followpos ( ).** **[10 Marks]**	**15**
3		Consider the following grammar G: **S → S + T | T** **T → id | id [ ] | id |F]**	

	a)	**F → S , S | S** i. Eliminate left recursion in **G** to construct $\mathbf{G_1}$ with $L(\mathbf{G_1})=L(\mathbf{G})$. **[2 Marks]** ii. Perform left factoring for $\mathbf{G_1}$ to construct $\mathbf{G_2}$ with $L(\mathbf{G_2})=L(\mathbf{G_1})$. **[2 Marks]** iii. Compute the FIRST and FOLLOW sets for all non-terminals in $\mathbf{G_2}$. **[4 Marks]**	**15**
	b)	i. Build an LL(1) parse table for the grammar $\mathbf{G_2}$. **[3 Marks]** ii. Parse the string **id + id [id + id , id[ ]]**. Show the stack, the input, and the action taken at every stage of parsing. **[2 Marks]** iii. Build the parse tree while you are parsing. Show your parse tree. **[2 Marks]**	
4.		Perform operator precedence parsing for the following grammar. **S → (L) | a** **L → L , S | S** i. Find leading and trailing of each non-terminal. **[2 Marks]** ii. Construct precedence table. **[2 Marks]** iii. Show the actions of the parser for the input **(a, ((a, a), (a, a)))** **[3 Marks]** iv. Construct operator precedence function. **[3 Marks]**	**10**

**********All the best **********

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Continuous Assessment Test 1– May 2023

Programme	:	B. Tech CSE and specialization	**Semester**	:	Fall Inter 2022-23
Course	:	Compiler Design	**Code**	:	BCSE307L
			Slot(s)	:	F1+TF1
Faculty	:	Dr. S. Venkatraman Dr. P. Sivakumar Dr. WI. Suresh Kumar Dr. R. Suganya Dr. R. Ashoka Rajan Dr. Mercy Rajaselvi Beaulah P Dr. S. Srisakthi	**Class Nbr**	:	CH2022232500856 CH2022232500858 CH2022232500860 CH2022232500861 CH2022232500864 CH2022232500865 CH2022232501177
Time	:	1½ Hours	**Max. Marks**	:	50

Answer ALL the Questions

1	i. Construct €-NFA for the regular expression **((a+b)*a)+ ((a+b)*ab)** (5 Marks) ii. Give the regular expression for the set of strings over **{a, b, c}** containing even number of **a's** (2.5 Marks) iii. Give the regular expression for the set of strings over **{a, b, c}** that contains exactly one **b** (2.5 Marks)	10 Marks
2	Elucidate the different stages in the process of compilation specifying the content of symbol table at each stage for the following input: **p = q * 210.22 / (r % 4 + 5) - s * 2 ^ 3,** where ^ is exponentiation operation and **%** is modulo operation	10 Marks
3	Construct DFA for the following regular expression **(a | b)*abab** using the direct method.	10 Marks
4	Construct predictive parsing table for the following grammar. (7 Marks) **S-> A** **A-> aB | Ad** **B-> bBC | f** **C→ g** Show the actions of the parser for the input string **"afd"** (3 Marks)	10 Marks
5	Perform operator precedence parsing for the following grammar. **S-> (L) | a** **L -> L , S | S** a) Find Leading(S) and trailing of (S) (2.5 Marks) b) Construct precedence table (2.5 Marks) c) Show the actions of the parser for the input **(a, (a, a))** (2.5 Marks) d) Perform operator precedence function (2.5 Marks)	10 Marks

******* END *******