



**Continuous Assessment Test 2 (CAT - 2) – JUNE 2023**

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

**Answer All Questions**

Total Marks: 50

1.	(Done) a)	Construct SLR parsing table for the following grammar (5 marks). Check whether the grammar is a SLR grammar or not Explain your answer with reasons. (5 marks). Parse the grammar with the input string "int id, id;" (5 marks). $D \rightarrow TL; \quad 1$ $T \rightarrow int \quad 2$ $T \rightarrow double \quad 3$ $L \rightarrow L, id \quad 4$ $L \rightarrow id \quad 5$	15
2.	(Done) a)	Consider the Production rule $S \rightarrow AS \{Print (1)\}$ $S \rightarrow AB \{Print (2)\}$ $A \rightarrow a \{Print (3)\}$ $B \rightarrow bC \{Print (4)\}$ $B \rightarrow dB \{Print (5)\}$ $C \rightarrow c \{Print (6)\}$ Create the annotated parse tree for the input "aadbcb" (5 marks)	15
	(Done) b)	Translate the following arithmetic expressions into quadruples, triples and indirect triples i. $y = -(a*b) + (c+d)$ (5 marks) ii. $x = (a+b*c)^{(d*e)} + f*g^h$ (5 marks)	
3.	(Done) a)	i. Give a syntax-directed definition to differentiate expressions formed by applying the arithmetic operators + and * to the variable x and constants; expression: $x * (3 * x + x * x)$ . (5 marks) ii. Describe the process by which names can be looked up in the symbol table. (2 marks) iii. Discuss specification of a simple type checker. (3 marks)	10
4.	(Done) a)	Apply backpatching to generate intermediate code for the input while (a<b or a>c) { if (a==1) { c=c+1; } }	10

		<pre>} else {   b=b+1:   break; } }</pre>	
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# VIT

Vellore Institute of Technology  
Deemed to be University under section 3 of U.G. Act, 1956  
CHENNAI

Reg. Number:

## Continuous Assessment Test(CAT) – II - OCT 2024

Programme	:	B.Tech BCE, AI & ML, CPS, AIR, ECM	Semester	:	Fall Semester 2024-2025
Course Code & Course Title	:	BCSE307L Compiler Design	Class Number	:	CH2024250102280 CH2024250102282
Faculty	:	Dr. P. Mercy Rajaselvi Dr. Leninisha Shanmugam	Slot	:	D1+TD1
Duration	:	90 Minutes	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	Description	Marks
1.	<p>Consider the grammar G with the following productions. The symbols { S, X, Y } are Non-terminals and the symbols { #, 0, 1 } are terminals.</p> <p>Grammar G:</p> $S \rightarrow X \# X$ $X \rightarrow XY$ $X \rightarrow Y$ $Y \rightarrow 0$ $Y \rightarrow 1$ <p>i) Construct the Canonical LR parser with look ahead of one input symbol for given the grammar G. (10 Marks)</p> <p>ii) Show the stack status, input buffer and shift/reduce action for parsing the string "1101#01". (5 Marks)</p>	15
2.	<p>i) Consider the following grammar and its syntax directed translation scheme (SDT).</p> $A \rightarrow B \{ R.inh = B.val \} R \{ A.val = R.syn \}$ $R \rightarrow - B \{ R_1.inh = R.inh - B.val \} R_1 \{ R.syn = R_1.syn \}$ $R \rightarrow \epsilon \{ R.syn = R.inh \}$ $B \rightarrow C \{ S.inh = C.val \} S \{ B.val = S.syn \}$ $S \rightarrow * C \{ S_1.inh = S.inh * C.val \} S_1 \{ S.syn = S_1.syn \}$ $S \rightarrow \epsilon \{ S.syn = S.inh \}$ $C \rightarrow num \{ C.val = num.val \}$ <p>Illustrate the evaluation of the expression "8*7-4*9" using the dependency graph. (8 Marks)</p> <p>ii) Write the grammar and the syntax directed translation scheme to find the sum of the digits. Parse the number "4876" and compute its sum using the SDT. (7 Marks)</p>	15
3/	i) Convert the given string "%a&b^c#a^%b" into three address code based on	10

	<p>the given grammar. (4 Marks)</p> <p>ii) Represent the converted three address code in Quadruples, Triples and syntax tree. (6 Marks)</p> <p>Grammar G:</p> $E \rightarrow E \wedge T \mid T$ $T \rightarrow T \& F \mid F$ $F \rightarrow F \# G \mid G$ $G \rightarrow \% H \mid H$ $H \rightarrow (E) \mid a \mid b \mid c$ <p style="text-align: right;"><i>Handwritten: <math>\% a \&amp; b \wedge c \# a \wedge \% b</math></i></p>	
<p><i>Handwritten: A.</i></p>	<p>Parse the following programming construct using the parse tree (5 Marks) and generate the corresponding intermediate code. (5 Marks)</p> <pre> while (i &lt; 10    a &lt; b) {   if (a &lt; 60) &amp;&amp; (b &gt; i)   {     a = a + i - b * 2;   }   i = i + 1;   b = b - 1; } </pre>	10

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



# VIT

Vellore Institute of Technology  
Chennai 600 127  
CHENNAI

Reg. Number:

1138

## Continuous Assessment Test (CAT) – II October 2024

Programme	: B. Tech CSE and specialisation	Semester	: Fall 2024-25
Course Code & Course Title	: BCSE307L - Compiler Design	Slot	: G2+TG2
Faculty	: Dr. SUGANYAR Dr. NAGARAJ S V Dr. SELVAM D Dr. SURESHKUMAR WI	Class Number	: CH2024250101301 CH2024250101295 CH2024250101299 CH2024250101297
Time	: 90 Minutes	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.	Question	Marks
1		Construct the LALR parser for the grammar given below. Show the actions of the parser for a valid and invalid string at the input. $S \rightarrow a   ^   (R)$ $T \rightarrow S, T   S$ $R \rightarrow T$	15
2		Construct the Syntax-Directed Definition (SDD) using semantic rules with controlled side-effect for the following grammar. $S \rightarrow T L$ $T \rightarrow \text{int}$ $T \rightarrow \text{float}$ $T \rightarrow \text{double}$ $L \rightarrow L1, id$ $L \rightarrow id$ Give an annotated parse tree for the expressions of 1) int a, b, c    2) float x, y, z	10
3	a	Translate the following arithmetic expression into quadruple, triple, and indirect triple representations. (9 marks) $Y = a + b * c + d * c + d * - e + d * - e + d * - e$	15



	b	<p>Translate the following program into three-address intermediate code. (6 marks)</p> <pre> prod = 0; i = 1; do {     prod = prod + a[i] * b[i];     i = i + 1; } while (i &lt;= 10); </pre>	
4.		<p>Generate the Directed Acyclic Graph (DAG) for the following expressions.</p> <ol style="list-style-type: none"> <li><math>((a + b) - ((a + b) * (a - b))) + ((a + b) * (a - b))</math></li> <li><math>x + x + (x + x + x + (x + x + x + x))</math></li> <li><math>(x + x * (y - x)) * ((y - x) + z) + ((y - x) * z)</math></li> <li><math>(a + b) + ((a - b) * (a * b)) + ((a + b) * (a + b))</math></li> </ol>	10
*****All the best *****			



**Continuous Assessment Test (CAT) – II APRIL 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:**

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**Answer all questions**

Q. No	Sub Sec.	Description	Marks
1 (Done)		Construct SLR(1) parsing table for the following grammar: <i>follow(s) =</i> $S \rightarrow aBCa$ $B \rightarrow d B d   a$ $C \rightarrow e C e   a$	7
2		Construct CLR(1) parsing table for the following grammar: $S \rightarrow X$ $X \rightarrow Y b   a a$ $Y \rightarrow a   b Y a$	8
3 (Done)		Consider the given grammar of syntax directed translation scheme and answer the following. $S \rightarrow S / T$ $S \rightarrow T$ $T \rightarrow R - T$ $T \rightarrow R$ $R \rightarrow \text{num}$ <i>but Sval = Tval</i> $Sval = Tval$ $Tval = Rval - Tval$ $Tval = Rval$ $Rval \rightarrow \text{num value}$	15

	<p>a)</p> <p>b)</p> <p>c)</p>	<p>Write down the semantic rules of the above grammar productions. (5 Marks)</p> <p>Draw the annotated parse tree for "<u>128 / 4 / 10 - 2 / 5 - 3 - 2</u>" and print the result. (5 Marks)</p> <p>Also draw the dependency graph (5 Marks)</p>	
<p>4.</p> <p>(Done)</p>	<p>a)</p> <p>b)</p>	<p>Consider the following arithmetic expression</p> <p><math>x = a - b - c * d + e - (f + g * h - 5)</math></p> <p>Generate the three address intermediate code representation for the given expression (4 Marks)</p> <p>Construct the quadruple, triple and indirect triple intermediate code representations for the given expression (2+2+2 Marks)</p>	<p>10</p>
<p>5.</p> <p>(Done)</p>		<p>Consider the following Boolean expression</p> <p><math>(A &lt; B \ \&amp;\&amp; \ C &lt; D) \ \ \ (E &lt; F \ \&amp;\&amp; \ C &gt; B) \ \ \ D \neq F</math></p> <p>Apply back patching and construct the parse tree (6 Marks)</p> <p>Generate the three address code from the parse tree (4 Marks)</p>	<p>10</p>

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