Bangladesh Army University of Engineering and Technology (BAUET) Department of Computer Science and Engineering (CSE) (CSE9th Batch) Compiler Assignment List

SI .	Student ID	Assignment Question
1	19104001	 Find out First and Follow set from the following grammar X → XSb / Sa / b S → Sb / Xa / a ii. S → Aa / b
		 iii. + → +BC/+fhjhesk/+jckfhgiu/thgiurshg C → +nkdsgnk/Cdiovjdioj/unhguid
2	19104003	Give 5 example for each optimization technique. a. Dead code elimination b. Variable elimination c. Code motion d. Reduction in strength
3	19104004	1. Write a code to find out X is a perfect number or not. For that code find out leader, design basic block and control flow graph. Here X = your id.
4	19104005	1. Consider the following program code: Prod=0; I=1; Do{ Prod=prod+a[i]*b[i]; I=i+1; } while (i<=10); a. Partition in into blocks b. Construct the flow graph 2. What is code optimization? Explain machine dependent and independent code optimization.
5	19104006	1. Write a short note with example to optimize the code: a. Dead code elimination b. Variable elimination c. Code motion d. Reduction in strength 2. What is control and data flow analysis? Explain with example.
6	19104007	 Develop a DAG and three address code for the expression. x = ((a + b) / (b-c)) - (a + b) * (b-c) + f. Create DAG and three – address code for the following C program. i = 1; s = 0; while (i <= 10) { s = s + a[i] [i]; i = i + 1; }
7	19104008	1. Write a code to find out X is a perfect number or not. For that code design a symbol table and write down token. Here X = your id.
8	19104010	1. Write a code to find out X is a perfect number or not. For that code design three address code, triples. Here X = your id.
9	19104011	1. For the statement given, write three address statements and construct DAG. a. a+a*(b-c)+(b-c)*d+g(g+h) b. s{d+g}/g+f(t+g)+g_g+g*h
10	19104012	1. Write a code to find out X is a perfect number or not. For that code design a symbol table and write down token. Here $X = your$ id.
11	19104013	1. Show the following grammar is LR(1) but not LALR(1).

		S->Aa bAc Bc bBa
		A->d
		B->d 2. Write the comparison among SLR Parser, LALR parser and Canonical LR Parser
		When does dangling references occur
12	19104014	2. Mention the two rules for type checking.
		3. Mention and explain the applications of DAGs. List the advantages of DAG.
13	19104015	1. Write a code to find out X is an Armstrong number or not. For that code find
13	1310-013	out leader, design basic block and control flow graph. Here X = your id.
14	19104016	1. What are the various phases of a compiler? Explain each phase in
		detail by using the input "a=(b+c)*(b+c)*2
15	19104018	 Write the algorithm for FIRST and FOLLOW in parser. What is dangling reference? Explain.
		 Solve the following grammar is ambiguous: S→aSbS / bSaS /ε
16	19104019	2. Explain Top- Down parsing and Bottom up Parsing.
		Eliminate Left recursion in the following grammar
		i. $X \rightarrow XSb / Sa / b$
		$S \rightarrow Sb / Xa / a$
		ii. $S \rightarrow Aa/b$
1.7	1010100	
17	19104020	$A \rightarrow Ac / Sd / \in$
		iii I DO/ theib a a le/ tial fla air the air tag la
		iii. + → +BC/+fhjhesk/+jckfhgiu/thgiurshg C → +nkdsgnk/Cdiovjdioj/unhguid
		C → Tikusgiik/Culovjuloj/uliligulu
18	19104022	1. Write a code to find out X is a perfect number or not. For that code design a
10	19104022	symbol table and write down token. Here $X = your id$.
		1. Write about the Error handling in different phases. (OR) Explain various Error
19	19104023	encountered in different phases of compiler.
		 Explain language processing system with neat diagram. Eliminate Left recursion in the following grammar
		i. $K \rightarrow kldgdg/Kd)/()ghK/K=\&/c$
		G → Ghjl/Kjjhsj/Gjdvb/llk
20	19104024	ii. $D \rightarrow CA/H$
20	13104024	$C \rightarrow Ca / sd / \in$
		iii. & \rightarrow jhfdhjk/jsfha/elirhe/eorhjif
		$Kha \rightarrow fehnnf / jfbaj /)(*)$
		Do Left factoring in the following grammar
		i. $S \rightarrow aAd / aB$
		$A \rightarrow a / ab$
		B → ccd / ddc
21	19104025	ii. $S \rightarrow SaS'$
		$S' \rightarrow b / bc / bcd / \in$
		iii. S $ ightarrow$ aSSbS / aSaSb / abb / assssssbghr / asasdff / asabdgf/ b
	4010-55-5	
22	19104026	 Do Left factoring in the following grammar S →S aAd / aB
		A \rightarrow A+ a / +abb / +(),: / +scd / +scdhdfggfhd / +scd()nv / A+scd B \rightarrow ccd / ddc
		$B \rightarrow CCd / ddC$ ii. $S \rightarrow SaS^2/adfe/adf/adfgre/adfeg/adhtej$
		11. 5 · Sub radioradiradigioradiogradinoj

		$S' \rightarrow bcfe / bc / bcd / \in$ iii. $S \rightarrow vdeaS'/++kfjn / +=jdnfd /+= vde$
		in. 5 / vacas / + kijii / + juniu / + vac
23	19104027	1. Explain the various Compiler Construction Tools.
-		2. Differentiate NFA and DFA with proper example.
		1. Draw the syntax tree and DAG and also implement value number method for the following expression:
24	19104028	a. $(a*b)+(c+d)-(a+b+c+d)$
		b. (a+(b*c)^d-e/(f+g)
		c. $(a*b)+(c-d)*(a*b)+b$
		1. Eliminate Left recursion in the following grammar
		$\begin{array}{ccc} i. & * \rightarrow * +) & &) \\ & &) \rightarrow) * \{ & & \{ \end{array}$
		$\left\{ \begin{array}{c} \uparrow & \uparrow & \downarrow \\ \uparrow & \uparrow & \downarrow \\ \uparrow & \uparrow & \downarrow \end{array} \right\}$
		ii. temp → std
25	19104029	$ter \rightarrow ter$, d/ter% e/;?/ac
		$L \rightarrow LBc / f / : > ?$
		iii. $= \rightarrow Ba / = a / c$
		$B \rightarrow Bb / A^{"}b / d$
		B / Bo / A o / a
		1. Write short notes
		a) Application of compiler technologyb) Specification of Tokens
26	19104030	c) Define LL(1)
		d) Differences between SLR, CLR, LALR parsers?
		e) Problems in Top Down Parsing?
		1. Write three address quadruples, triples and indirect triples for the expression:
27	19104031	d. $(a*b)+(c+d)-(a+b+c+d)$ e. $(a+(b*c)^d-e/(f+g)$
		f. (a*b)+(c-d)*(a*b)+b
		1. Find out First and Follow list from the following grammar.
		i. $S \rightarrow S \text{ aAd / aB}$
		A \rightarrow A+ a / +abb / +(),: / +scd / +scdhdfggfhd / +scd()nv / A+scd B \rightarrow ccd / ddc
		ii. $* \rightarrow * +) \mid)$
28	19104032)→)*{ (
		$\left\{ \begin{array}{c} (-)(*) \\ (-)(*) \end{array} \right\}$
		iii. $X \rightarrow XSb / Sa / b$ $S \rightarrow Sb / Xa / a$
		5 - 30 / Aa / a
29	19104033	1. Write a code to find out X is an Armstrong number or not. For that code design
		 a symbol table and write down token. Here X = your id. Write a code to find out X is an prime number or not. For that code design each
30	19104034	phase of compiler. Here $X = your id$.
31	19104035	1. Write a code to find out X is an Armstrong number or not. For that code design
32	19104037	each phase of compiler. Here X = your id.
32	13104037	 1. Find out First and Follow list from the following grammar. i. S → aBDh
		$B \to cC$
		$C \rightarrow bC / \in$
		$D \rightarrow EF$
		$E \rightarrow g / \in$
		$F \to f/\in$
		ii. $S \rightarrow A$ $A \rightarrow aB / Ad$
		$A \rightarrow aB/AU$ $B \rightarrow b$
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		iii. $C \rightarrow g$ $E \rightarrow E + T / T$ $T \rightarrow T \times F / F$ $F \rightarrow (E) / id$
33	19104038	 What is the use of First() and Follow() in compiler design. Let G be a Context Free Grammar for which the production Rules are given below: S -> aB bA A -> a aS bAA B -> b bS aBB Drive the string aaabbabbba using the above grammar (using Left Most Derivation and Right most Derivation).
34	19104041	 Distinguish the difference between left factoring and left recursion. What is non determinism? Give 3 example where actually non determinism occur and how can we solve this problem.
35	19104042	 Define Ambiguous grammar. Give 5 example of ambiguous grammar and also prove it.
36	18104061	1. Eliminate Left recursion in the following grammar i. $E \rightarrow E + T \mid T$ $T \rightarrow T^*F \mid F$ $F \rightarrow (E) \mid id$ ii. $S \rightarrow A$ $A \rightarrow Ad \mid Ae \mid aB \mid ac$ $B \rightarrow bBc \mid f$ iii. $A \rightarrow Ba \mid Aa \mid c$ $B \rightarrow Bb \mid Ab \mid d$
37	18204062	 Find out First and Follow set from the following grammar i. E→E+T T
38	17204051	1. Draw DAG for the following basic block and also implement Value number method i. $T_1:=4*I_0$ $T_2:=a[T_1]$ $T_3:=4*I_0$ $T_4:=b[T_3]$ $T_5:=T_2*T_4$ $T_6:=prod+T_5$ $prod:=T_6$ $T_7:=I_0+1$ $I_0:=T_7$ $if I_0 <= 20 goto 1$ ii. $a=b \times c$ $d=b+a$

		$e = d \times c$ $b = e + a$ $f = b + c$ $g = f + d + b$
		 Draw DAG for the following basic block and also implement Value number method i. (a+b)x(a+b+c) ii. (((a+a)+(a+a))+((a+a)+(a+a)))
		iii. B10: $S1 = 4 \times I$ S2 = addr(A) - 4
39	18204014	S3 = S2[S1] $S4 = 4 \times I$ S5 = addr(B) - 4
		S6 = S5[S4] S7 = S3 x S6
		S8 = PROD + S7 PROD = S8 S9 = I + 1
		I = S9 If I <= 20 goto L10