

B.TECH./CSE/EVEN/6th/CS604A/2020-2021

PAPER TYPE: REGULAR(R18)

YEAR: 2021

COMPILER DESIGN

CS604A

TIME ALLOTTED: 3 HOURS

FULL MARKS: 70

*The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable*

GROUP – A
(Multiple Choice Type Questions)

1. Answer any **ten** from the following, choosing the correct alternative of each question: **10×1=10**

SL. NO.	Question	Marks	CO No.
(i)	Which data structure is mainly used during shift-reduce parsing? a) Stack b) Array c) Queue d) Pointer	1	3
(ii)	Output of lexical analysis phase is a) token b) parse tree c) code d) object code	1	2
(iii)	Type checking is done normally during a) Lexical analysis b) Syntax analysis c) Syntax directed translation d) Code generation	1	1
(iv)	a* means? a) {epsilon,a,aa,...} b) {a,aa,...} c) {a,aa,aaa,aaa} d) {a,aa,aaa,aaa,...}	1	1
(v)	Role of preprocessor is to a) Produce output data b) Produce output to compilers c) Produce input to compilers d) None of these	1	4
(vi)	Which of the following is not an intermediate code form? a) Quadruples b) Triples c) Abstract syntax tree d) Indirect triples	1	1
(vii)	A basic block can be analyzed by a a) DAG b) Flow graph c) Graph with cycle d) None of these	1	2
(viii)	A basic block can be analyzed by a) DAG b) A graph which may involve cycles	1	3

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	c) Flow graph		
	d) None of these		
(ix)	If a grammar is LALR(1) it is necessarily	1	4
	a) LL(1)		
	b) SLR(1)		
	c) LR(1)		
	d) None of these		
(x)	A optimized compiler	1	1
	a) Is optimized to take less time for execution		
	b) Optimized the code		
	c) Is optimized to occupy less space		
	d) None of the mentioned		
(xi)	A basic block can be analyzed by	1	3
	a) DAG		
	b) A graph which may involve cycles		
	c) Flow graph		
	d) None of these		
(xii)	The grammar $E \rightarrow E+E E*E a$ is	1	2
	a) Ambiguous		
	b) Unambiguous		
	c) Both a and b		
	d) None of these		

GROUP – B
(Short Answer Type Questions)

Answer any *three* from the following

SL. NO.		Marks	CO No.
2.	Explain inherited attributes and synthesized attributes for syntax directed translation with suitable example.	5	2
3.	(a) What is type checking?	1	3
	(b) Eliminate Left Recursion from the following grammar. $S \rightarrow Aa \mid b$ $A \rightarrow Ac \mid Sd \mid \epsilon$	4	2
4.	$E \rightarrow T \mid E+T$ $T \rightarrow F \mid T*F$ $F \rightarrow V \mid (E)$ $V \rightarrow a \mid b \mid c \mid d$ Generate the parse tree for $a + b * c$	5	1
5.	Draw a Syntax tree and DAG from the following expression $(a+b) + (e+(c-d))$	5	4
6.	What is activation record? Explain clearly the components of activation record.	5	3

GROUP – C
(Long Answer Type Questions)

Answer any *three* from the following

SL. NO.		Marks	CO No.
7.	(a) How the following statement is translated via different phases of compilation? Explain $MOTION = DISTANCE + RATE * DISPLACEMENT + 70$	10	3
	(b) What is an operator precedence parser?	2	2

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	(c)	List the advantages and disadvantages of operator precedence parsing.	3	3
8.	(a)	Consider the following grammar: $E \rightarrow E+T/T$ $T \rightarrow T*F/F$ $F \rightarrow (E)/id$ Obtain the FIRST and FOLLOW sets for the above grammar. Construct the predictive parsing table of the above grammar.	9	2
	(b)	What is the difference between Quadruples, Triples and Indirect Triples?	3	2
	(c)	Generate machine code for the following instruction : $V=a+(b*c)-d$	3	3
9.	(a)	Consider the following grammar : $E \rightarrow E + T$ $E \rightarrow T$ $T \rightarrow T * F$ $T \rightarrow F$ $F \rightarrow (E)$ $F \rightarrow id$ Draw a SLR state transition diagram for the above grammar. Also draw SLR parse table.	10	4
	(b)	Check if the string $id + id * id$ is parsed or not from the above SLR parsing table.	5	3
10.	(a)	Translate the following expression: $a=b* - c+b* -c$ into i) Quadruples ii) Triples iii) Indirect Triples	9	4
	(b)	What is Activation Tree? Give an example.	3	4
	(c)	What do you mean by Handle? $E \rightarrow E+E / E*E / (E) / id$ Find out the Handles for the string $id+id*id$.	3	4
11.		Write short note of any three from the following:		
	(a)	Left Factoring	5	1
	(b)	Symbol Table	5	3
	(c)	Cross compiler	5	2
	(d)	YACC	5	4
	(e)	LEX	5	4