

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous) Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	COMPILER DESIGN
Course Code	:	AIT004
Program	:	B.Tech
Semester	:	V
Branch	:	Computer Science and Engineering
Section	:	A,B,C,D
Academic Year	:	2019 - 2020
Course Faculty	:	Dr. K Srinivasa Reddy, Professor Y Harika Devi, Assistant Professor

COURSE OBJECTIVES:

The	course shou <mark>ld enable the students</mark> to:
Ι	Apply the principles in the theory of computation to the various stages in the design of compilers.
II	Demonstrate the phases of the compilation process and able to describe the purpose and operation of each phase.
III	Analyze problems related to the stages in the translation process.
IV	Exercise and reinforce prior programming knowledge with a non-trivial programming project to construct a compiler.

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		UNIT-I				
1	Define Compiler	Compiler is a computer program that translates computer code written in one programming language (the source language) into another programming language (the target language).	Remember	CO 1	CLO 1	AIT004.01
2	Define interpreter	An interpreter is a computer program that is used to directly execute program instructions written using one of the many high-level programming languages.	Remember	CO 1	CLO 1	AIT004.01
3	Define Translator	A translator is a program that takes as input a program written in one language and produces as output a program in another language.	Remember	CO 1	CLO 1	AIT004.01
4	What are the types of translators	There are three types a) Interpreter b)Compiler	Remember	CO 1	CLO 1	AIT004.01

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		c)preprocessor				
5	What is a Token	Token is a sequence of characters that can be treated as a single logical entity.	Remember	CO 1	CLO 1	AIT004.01
6	Define Pattern	A set of strings in the input for which the same token is produced as output. This set of strings is described by a rule called a pattern associated with the token.	Remember	CO 1	CLO 3	AIT004.03
7	List Some Compilers	 a)Ada compilers b)ALGOL compilers c) BASIC compilers d)C# compilers e) C compilers f) C++ compilers g) COBOL compilers h) Java compilers 	Remember	CO 1	CLO 1	AIT004.01
8	Define Lexeme	A lexeme is a sequence of characters in the source program that is matched by the pattern for a token.	Remember	CO 1	CLO 1	AIT004.01
9	Define Left Recursion	Left recursion is a special case of recursion where a string is recognized as part of a language by the fact that it decomposes into a string from that same language (on the left) and a suffix (on the right).	Understand	CO 1	CLO 4	AIT004.04
10	What are specifications of tokens	There are 3 specifications of tokens: a) Strings b)Language	Understand	CO 1	CLO 1	AIT004.01
11	Define Language	c) Regular expression A language is a set of strings, chosen form some Σ^* or A language is a subset of Σ^* . A language which can be formed over ' Σ 'can be Finite or Infinite. Language that contains strings over $\Sigma = \{a, b\}$ are $\{\varepsilon, a, b, aa, ab\}$	Remember	CO 1	CLO 3	AIT004.03
12	What is a regular expression	Regular expression is an Algebraic way to represent a language.	Understand	CO 1	CLO 3	AIT004.03
13	Define Automata	Automation is defined as a system where information is transmitted and used for performing some functions without direct participation of man.	Understand	CO 1	CLO 2	AIT004.02
15	What is the difference between compiler and interpreter	A compiler converts the high level instruction into machine language while an interpreter converts the high level instruction into an intermediate form.	Remember	CO 1	CLO 1	AIT004.01
16	What are the functions of parser	a)It checks if the tokens from lexical analyzer, occur in pattern that are permitted by the	Understand	CO 1	CLO 4	AIT004.04

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
0.110	QUESTION	specification for the source	Dioonis Lever	00	CLU	CLO COUC
		language.				
		b)It also imposes on tokens a				
		tree-like structure that is used by				
		the sub-sequent phases of the				
17	Define Lexical	compiler. Lexical analyzer (the "lexer")	Remember	CO 1	CLO 3	AIT004.03
17	Analyzer	parses individual symbols from	Remember	001		111001.05
	·	the source code file into tokens.				
18	Define Phase	A phase is a logically	Remember	CO 1	CLO 4	AIT004.04
		interrelated operation that takes				
		source program in one representation and produces				
		output in another representation.	-	-		
19	What is a Loader	A loader is a program that	Understand	CO 1	CLO 1	AIT004.01
		places programs into memory		\sim		
		and prepares them for execution.				
20	Identify the	Subset, superset, infinite union	Remember	CO 1	CLO 3	AIT004.03
	properties under which regular	and infinite intersection.				
	languages are not					
	closed					
21	Identify Regular	Regular expression for all	Understand	CO 1	CLO 3	AIT004.03
	expression for	strings which may begin with				
	strings without two consecutive	either 0 or 1 and without				
	one's 11?	consecutive one's $(1+ \in)(0+01)^*$				
22	What is an	Identifiers are the set or string of	Remember	CO 1	CLO 1	AIT004.01
	Identifier	letters and digits beginning with				
		a letter.				
23	Explain Recursive Decent	Recursive descent is a top-down	Understand	CO 1	CLO 5	AIT004.05
	Parsing	parsing technique that constructs the parse tree from the top and				
	T urbing	the input is read from left to		-		
	0	right.			C	
24	Define	A grammar is said to be	Remember	CO 1	CLO 2	AIT004.02
	ambiguous	ambiguous if it has more than				
	grammar	one derivation trees for a sentence or in other words if it				
		has more than one leftmost				
		derivation or more than one		Q		
	D. 6	rightmost derivation	D. I	0.0	ar a i	
25	Define pass	The transversal of a compiler	Remember	CO 1	CLO 1	AIT004.01
		through the entire program is known as a Pass.				
26	What is Left	Left factoring is a grammar	Remember	CO 1	CLO 4	AIT004.04
	factoring	transformation technique used				
		for removing the common left				
		factor that appears in two				
		productions of the same non-terminal.				
27	What is LL	LL parser is a top down parser	Understand	CO 1	CLO 5	AIT004.05
	parser	which parses the input from Left				
		to right, performing Leftmost				
	XX71	derivation of the sentence	Den 1	CO 1		A ITCO 4 0.5
28	What is the role of Top-down	In Top down parser parsing starts with the starting symbol S.	Remember	CO 1	CLO 5	AIT004.05
	Parser	and moves down from root node				
		to leaf nodes using productions				
			•			·

S.No	QUESTION	ANSWER	Blooms Level	СО	CLO	CLO Code
29	List the	a)The root node is always a	Remember	CO 1	CLO 4	AIT004.04
	properties of	node indicating start symbol				
	Derivation tree	b)The derivation is read from				
		left to right c)The leaf nodes always				
		terminals nodes				
		d)The interior nodes are always				
		non terminal nodes				
30	Define sub tree?	A subtree of a derivation tree is	Remember	CO 1	CLO 4	AIT004.04
		a particular vertex of the tree				
		together with all its descendants ,the edges				
		connecting them and their				
		labels. The label of the root may				
		not be the start symbol of the				
		grammar.)		
		UNIT-II				
			D	6 6 1	ar a i	
1	Define Parser.	A parser takes input in the form	Remember	CO 2	CLO 4	AIT004.05
		of sequence of tokens and				
		produces output in the form of parse tree.				
		parse liee.				
2	List the types of	There are two types of parsers	Remember	CO 2	CLO 5	AIT004.05
	parsers.	a) Topdown parsing				
		b) Bottom parsing		~ ~~		
3	What is bottom	In the bottom up parsing, the	Understand	CO 2	CLO 5	AIT004.05
	up parsing?	parsing starts with the input symbol and construct the parse				
		tree up to the start symbol by				
	-	tracing out the rightmost				-
		derivations of string in reverse.			<u> </u>	
4	What is top-down	Top-down parsing constructs parse tree for the input string,	Understand	CO 2	CLO 5	AIT004.05
	parsing?	starting from root node and				
	0	creating the nodes of parse tree			4	
	0	in pre-order.				
		It is done by leftmost derivation			100	
5	What are the	for an input string. a)Helps you to detect all types	Understand	CO 2	CLO 4	AIT004.04
5	What are the tasks performed	of Syntax errors	Understand	02	CLU 4	A11004.04
	by parser.	b)Find the position at which		~		
		error has occurred				
		c)Clear & accurate description				
		of the error. d)Recovery from an error to				
		continue and find further errors				
		in the code.				
		e)The parse must reject invalid				
	XX 71 4 -1	texts by reporting syntax errors		00.0		
6	What are the	Common Errors that occur in	Remember	CO 2	CLO 4	AIT004.04
	common errors occur in parser.	Parsing a)Lexical: Name of an				
	seear in purser.	incorrectly typed identifier				
		b)Syntactical: unbalanced				
		parenthesis or a missing				
		semicolon				
		c)Semantical: incompatible				

value assignment d)Logical: Infinite loop and not reachable code			
reachable code			
7 Define handle. A handle of a string is a Rem	nember CO	2 CLO 5	AIT004.05
substring that matches the right			
side of a production and whose			
reduction to the non-terminal on			
the left side of the production			
represents one step along the reverse of a rightmost			
derivation.			
	nember CO	2 CLO 5	AIT004.05
pruning? reducing β to \hat{A} by the given			
production is called handle			
pruning i.e., removing the			
children of A from the parse			
A rightmost derivation in			
A rightmost derivation in reverse can be obtained by			
handle pruning.			
	nember CO	2 CLO 4	AIT004.04
reduce parser. bottom-up parsing that reduces a			
string w to the start symbol of			
grammar.It scans and parses the			
input text in one forward pass			
without backtracking. 10 What are the A shift-reduce parser can make Rem	nember CO	2 CLO 4	AIT004.04
actions of shift four possible actions			AI1004.04
reduce parser. a) shift			
b) reduce			
c) accept			
d) error.			
	lerstand CO 2	2 CLO 4	AIT004.04
conflicts occursshift-Reduce parser.in shift reducea)Shift-Reduce conflict			
parser b)Reduce-Reduce conflict			1
	lerstand CO	2 CLO 5	AIT004.05
step. the next input symbol by the			
shift step and the next input	/	1000	
symbol is known as shifted		A	
symbol and the symbol is pushed upon stack. The shifted			
symbol is considered as a single	1	6	
node of the parse tree.	100		
13 What is reduce When a complete grammar rule Und	lerstand CO	2 CLO 5	AIT004.05
step. RHS is replaced by LHS it is			
termed as reduce-step. The stack			
performs a pop function which facilitates in popping off the			
handle and replacing with the			
LHS non-terminal symbol.			
	nember CO 2	2 CLO 5	AIT004.05
Parser recursive, shift-reduce, bottom-			
up parser. It uses a wide class of			
context-free grammar which			
makes it the most efficient			
syntax analysis technique. 15 What is LR(K) LR parsers are also known as Rem	nember CO 2	2 CLO 5	AIT004.05
parser. LR(k) parsers, where L stands			11100+.05
for left-to-right scanning of the			

S.No	QUESTION	ANSWER	Blooms Level	СО	CLO	CLO Code
	-	input stream; R stands for the				
		construction of right-most				
		derivation in reverse, and k				
		denotes the number of				
		lookahead symbols to make				
		decisions.				
16	List the different	LR parsing is divided into four	Remember	CO 2	CLO 4	AIT004.04
	types of LR	parts:				
	Parsers.	a)LR (0) parsing,				
		b) SLR parsing,				
		c)CLR parsing				
17		d)LALR parsing.		GO 0		
17	What is LR	The LR algorithm requires	Remember	CO 2	CLO 4	AIT004.04
	algorithm.	stack, input, output and parsing				
		table. In all type of LR parsing,				
		input, output and stack are same but parsing table is different.				
18	What is Input	Input buffer is used to indicate	Remember	CO 2	CLO 4	AIT004.04
10	buffer?	end of input and it contains the	Kemember	002		AII004.04
		string to be parsed followed by a				
		\$ Symbol.				
19	What is parsing	Parsing table is a two	Understand	CO 2	CLO 4	AIT004.04
	table.	dimensional array. It contains	Charlotano	001	020.	
		two parts:				
		a)Action part				
		b)GoTo part.				
20	What is	Augmented grammar G` will be	Understand	CO 2	CLO 5	AIT004.04
	Augmented	generated if we add one more				
	Grammar?	production in the given grammar				
		G. It helps the parser to identify				
		when to stop the parsing and				
		announce the acceptance of the				
		input. for example		_		
		$S \rightarrow S$		_	100	
		$S \rightarrow AA$ $A \rightarrow aA \mid b$				2
21	What is SLR (1)	a) It is Simple LR Parser	Remember	CO 2	CLO 5	AIT004.05
<i>2</i> 1	Parser.	b)It works on smallest class of	Kemeniber	02		ATT004.03
	ranser.	grammar				
		c)Few number of states, hence			100	
		very small table		0		
		c)Simple and fast construction		63		
22	What is LR (1)	a)It is LR Parser	Remember	CO 2	CLO 5	AIT004.05
	Parser.	b)It works on complete set of	1.13	2		
		LR(1) Grammar				
		c)Generates large table and				
		large number of states				
		d)Slow construction				
23	What is LALR	a) It is Look-Ahead LR Parser	Remember	CO 2	CLO 5	AIT004.05
	(1) Parser.	b) Works on intermediate size of				
		grammar				
		c)Number of states are same as				
		in SLR(1)				

S.No	QUESTION	ANSWER	Blooms Level	СО	CLO	CLO Code
24	What are the	LL:	Understand	CO 2	CLO 5	AIT004.05
	differences	a)leftmost derivation is done				
	between LL and	b) Parse tree is built top-down.				
	LR	c) Starts with the root non- terminal on the stack.				
		LR:				
		a) Rightmost derivation is done.				
		b) Parse tree is built bottom-up.				
		c) Ends with the root non-				
		terminal on the stack.				
25	What is CLR(1)	CLR refers to canonical	Remember	CO 2	CLO 5	AIT004.05
	parsing.	lookahead. CLR parsing use the				
		canonical collection of LR (1)		_		
		items to build the CLR (1)				
		parsing table. CLR (1) parsing		\sim		
		table produces the more number				
		of states as compare to the SLR (1) parsing.				
26	What is LR(1)	LR (1) item is a collection of LR	Understand	CO 2	CLO 5	AIT004.05
	item.	(0) items and a look ahead				
		symbol.				
		LR(1) item = $LR(0)$ item +				
		look ahead The look ahead is used to				
		determine that where we place				
		the final item. The look ahead				
		always add \$ symbol for the				
		argument production.				
27	What is YACC	a)YACC stands for Yet Another	Understand	CO 2	CLO 6	AIT004.06
	tool?	Compiler Compiler.				
		b)YACC provides a tool to				
		produce a parser for a given grammar.				100
		c)YACC is a program designed			1.1.1	
	0	to compile a LALR (1)		-	- C	>
	1	grammar.		-		
28	What is panic-	In the case when the parser	Remember	CO 2	CLO 6	AIT004.06
	mode error	encounters an error, this mode				
	recovery?	ignores the rest of the statement and not process input from			100	
		erroneous input to delimiter, like			h	
		a semi-colon. This is a simple		43		
		error recovery method.		\sim		
29	What is phrase-	Compiler corrects the program	Remember	CO 2	CLO 6	AIT004.06
	level error	by inserting or deleting tokens.				
	recovery?	This allows it to proceed to parse from where it was. It				
		performs correction on the				
		remaining input. It can replace a				
		prefix of the remaining input				
		with some string this helps the				
		parser to continue the process.		a a a	GL 0 -	
30	What is	An LR (0) item is a production	Understand	CO 2	CLO 5	AIT004.05
	canonical collection of	G with dot at some position on the right side of the production.				
	LR(0) items.	LR(0) items is useful to indicate				
	21(0) 10110.	that how much of the input has				
		been scanned up to a given point				
		in the process of parsing.				

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		UNIT-III				
1	Define Syntax Directed Translation	Syntax Directed Translations are augmented rules to the grammar that facilitate semantic analysis.	Remember	CO 3	CLO 7	AIT004.07
2	Define Syntax tree	A Syntax tree is a graphical depiction of a string derivation.	Remember	CO 3	CLO 7	AIT004.07
3	Define Attribute grammar	Attribute grammar is a special form of context-free grammar where some additional information (attributes) is appended to one or more of its non-terminals in order to provide context-sensitive	Remember	CO 3	CLO 7	AIT004.07
4	Define Synthesized attributes.	information. These attributes get values from the attribute values of their child nodes.	Remember	CO 3	CLO 7	AIT004.07
5	Define Inherited attributes.	Inherited attributes can take values from parent and/or siblings.	Remember	CO 3	CLO 7	AIT004.07
6	List the types of Attribute Grammar.	Synthesized attributes and inherited attributes.	Remember	CO 3	CLO 7	AIT004.07
7	What is S- attributed SDT ?	If an SDT uses only synthesized attributes, it is called as S- attributed SDT.	Remember	CO 3	CLO 8	AIT004.08
8	What is L- attributed SDT?	This form of SDT uses both synthesized and inherited attributes with restriction of not taking values from right siblings.	Remember	CO 3	CLO 8	AIT004.08
9	What is abstract syntax tree?	An abstract syntax tree, or just syntax tree, is a tree representation of the abstract syntactic structure of source code written in a programming language.	Remember	CO 3	CLO 7	AIT004.07
10	What is polish notation?	Prefix notation is also known as Polish Notation. In this operator is prefixed to operands.	Remember	CO 3	CLO 11	AIT004.11
11	What is three address code?	Three address code is a type of intermediate code which is easy to generate and can be easily converted to machine code.It makes use of at most three addresses and one operator to represent an expression and the value computed at each instruction is stored in temporary variable generated by compiler.	Remember	CO 3	CLO 11	AIT004.11
12	List the Intermediate forms of source programs	Abstract syntax tree, polish notation and three address code	Remember	CO 3	CLO 11	AIT004.11
13	List the types of three address codes.	a)Quadruple b)Triples c) Indirect Triples	Remember	CO 3	CLO 11	AIT004.11

QUESTION What is	ANSWER	Blooms Level	CO	CLO	
What is	Each instruction in quadruples	Remember	CO 3	CLO 11	CLO Code AIT004.11
Quadruple	presentation is divided into four				
		Domomhon	CO 2	CLO 11	AIT004.11
	1	Remember	03	CLO II	AI1004.11
	respective sub-expressions are				
	denoted by the position of				
			<u> </u>	GT 0 11	
	1	Remember	CO 3	CLO II	AIT004.11
code?	instead of position to store				
1	results.				
	Postfix notation is also known	Remember	CO 3	CLO 11	AIT004.11
polish notation?					
Write postfix	ab+c*	Understand	CO 3	CLO 11	AIT004.11
notation of					
			00.0	CT O 11	
	abc+*	Understand	03		AIT004.11
Write postfix	ab+cd+*	Understand	CO 3	CLO 11	AIT004.11
notation of		-			
(a+b)*(c+d)		D	00.0	CT O 11	
		Remember	CO 3	CLO 11	AIT004.11
What is High	High-level intermediate code	Remember	CO 3	CLO 9	AIT004.09
Level IR?	representation is very close to				2
0					
<u> </u>					
G					
0	enhance performance.			-	
What is Low	Low-level intermediate code	Remember	CO 3	CLO 9	AIT004.09
Level IR?	1				
	allocation, instruction set		1		
	selection, etc.		2		
Write three	t1 = a*b	Understand	CO 3	CLO 9	AIT004.09
	t2=t1+c				
Write three	t1= a+b	Understand	CO 3	CLO 9	AIT004.09
address code for	t2=t1*c				
-					
	{E.value:=E.value+T.value}	Understand	CO 3	CLO 8	AIT004.08
	[2.value.—2.value 1.value]	Chaelstand	005		1111007.00
statement					
E→E+T					
	{T.value:=T.value*F.value}	Understand	CO 3	CLO 8	AIT004.08
T→T*F					
	What is Reversed polish notation? Write postfix notation of (a+b)*c Write postfix notation of $a^*(b+c)$ Write postfix notation of (a+b)*(c+d) What is Annotated Parse Tree? What is High Level IR? What is Low Level IR? What is Low Level IR? Write three address code for the expression a^*b+c Write three address code for the expression (a+b)*c Write the SDT for following statement $E \rightarrow E+T$ Write the SDT for following statement	address code?result.What is Triples notation of three address code?Each instruction in triples presentation has three fields : op, arg1, and arg2.The results of respective sub-expressions are denoted by the position of expression.What is Indirect Triples notation of three address code?This representation is an enhancement over triples position to store results.What is Reversed polish notation?Postfix notation is also known as Reversed Polish Notation. In as Reversed Polish Notation. In this the operands.Write postfix notation of (a+b)*cab+c*Write postfix notation of (a+b)*cbb+c4Write postfix notation of (a+b)*cbb+c4+*What is I notation of (a+b)*(c+d)A parse tree showing the values of attributes at each node is called an Annotated parse tree.What is Low Level IR?Low-level intermediate code representation is close to the source code and we can easily apply code modifications to enhance performance.What is Low Level IR?Low-level intermediate code representation is close to the source code and we can easily apply code modifications to suitable for register and memory allocation, instruction set selection, etc.Write three address code for the expression (a+b)*ct1= a+b t2=t1+cWrite three tadewestt1= a+b t2=t1+cWrite three tadewestfE.value:=E.value+T.value}for following statementfT.value:=T.value*F.value}	address code?result.result.What is Triples notation of three address code?Each instruction in triples presentation has three fields : op, arg1, and arg2.The results of respective sub-expressions are denoted by the position of expression.RememberWhat is Indirect Triples notation of three address code?This representation is an enhancement over triples representation. It uses pointers instead of position to store results.RememberWhat is Reversed polish notation?Postfix notation is also known as Reversed Polish Notation. In this the operands.Remember as the operands.Write postfix atotation of (a+b)*cab+c*UnderstandWrite postfix notation of a*(b+c)ab+c+*UnderstandWhat is High LevelA parse tree showing the values a fatributes at each node is representation is very close to the source language itself. They can be easily generated from the source code and we can easily apply code modifications to enhance performance.RememberWhat is Low Level IR?Low-level intermediate code representation is close to the suitable for register and memory allocation, instruction set selection, etc.RememberWrite three address code for the expression a*b+c11= a+b t2=t1+cUnderstand t2=t1*cWrite three address code for the expression a*b+c11= a+b t2=t1*cUnderstand t2=t1*cWrite three address code for the expression a*b+c11= a+b t2=t1*cUnderstand t2=t1*cWrite three tatement11= a+b t2=t1*cUnderstand t2=t1*c	address code?result.result.CO 3What is Triples notation of three address code?Each instruction in triples op, arg1, and arg2. The results of respective sub-expressions are denoted by the position of expression.RememberCO 3What is Indirect Triples notation of three address code?This representation has here fields : expression.RememberCO 3What is Indirect Triples notation of three address code?This representation is also known as Reversed Polish Notation. In this the operator is postfixed to the operands.RememberCO 3Write postfix anotation of (a+b)*eab+c*UnderstandCO 3Write postfix notation of (a+b)*eab+c*UnderstandCO 3What is hotation of (a+b)*eA parse tree showing the values of attributes at each node is called an Annotated parse tree.RememberCO 3What is tis High Level IR?High-level intermediate code representation is very close to the source language itself. They can be easily generated from the source code and we can easily apply code modifications to enhance performance.CO 3Write three address code for the expression a*b+cUnderstand t2=t1*cCO 3Write three address code for the expression (a+b)*cUnderstand t2=t1*cCO 3Write three address code for the expression (a+b)*cUnderstand t2=t1*cCO 3Write three address code for the expression (a+b)*cUnderstand t2=t1*cCO 3Write three address code for the expression (a+b	address code?resultresultresultWhat is Triples notation of this Triples address code?Each instruction in triples op, arg1, and arg2. The results of respective sub-expressions are denoted by the position of expression.RememberCO 3CLO 11What is Indirect respective sub-expressions are denoted by the position of expression.RememberCO 3CLO 11What is Indirect resultsrepresentation is an enhancement over triples representation.RememberCO 3CLO 11What is Reversed polish notation?Positix notation is also known as Reversed Polish Notation. this the operator is posifixed to the operands.RememberCO 3CLO 11Write postfix (a+b)*cab+c*UnderstandCO 3CLO 11Write postfix (a+b)*(c+d)ab+c*UnderstandCO 3CLO 11What is I- Annotated Parse called an Annotated parse tree.RememberCO 3CLO 11What is I- what is Low Level IR?High-level intermediate code representation is very close to the source language itself. They can be easily generated from the source code and we can easily apply code modifications to enhance performance.RememberCO 3CLO 9Write three address code for the expression (a+b)*cLow-level intermediate code register and memory allocation, instruction set selection, etc.RememberCO 3CLO 9Write three address code for the expression (a+b)*cLow-level intermediate code register and memory allocation, instruction set selection, etc.Understand<

S.No	QUESTION	ANSWER	Blooms Level	СО	CLO	CLO Code
28	What are the	a)mknode(op,left,right)	Remember	CO 3	CLO 8	AIT004.08
	functions used	b)mkleaf(id,entry)				
	for constructing	c)mkleaf(num,val)				
	syntax trees.					
29	Write the SDT	{F.value:=digit.lexicalvalue}	Understand	CO 3	CLO 8	AIT004.08
	for following					
	statement					
20	F→digit		TT 1 / 1	00.1	CLO 0	
30	Write the SDT	{T.value:=T.value/F.value}	Understand	CO 3	CLO 8	AIT004.08
	for following statement					
	T→T/F					
	1 / 1/1					
		UNIT-IV				
1	Define Type	Type checking is simply testing	Remember	CO4	CLO 13	AIT004.13
-	Checking?	for type errors in given program,	1000000	001	010 10	11100.110
	0	either by the compiler or during				
		program execution.				
2	What is Static	Static checking includes the	Remember	CO4	CLO 14	AIT004.14
	checking?	syntax checks performed by the				
		parser and semantic checks such				
		as type checks, flow-of- control				
		checks, uniqueness checks, and				
		name-related checks.				
3	What is Dynamic	Dynamic type checking is the	Remember	CO 4	CLO 14	AIT004.14
	checking?	process of verifying the type				
		safety of a program at runtime. Common dynamically-typed				
		Common dynamically-typed languages include Groovy,				
		JavaScript, Lisp, Objective-C,				
		PHP, Prolog, Python, Ruby,				
		Small talk .				100
4	Explain Type	Type expressions are built from	Understand	CO 4	CLO 13	AIT004.13
	Expression?	basic types and constructors, a			- C	>
		natural concept of equivalence		_		
		between two type expressions is		1	4	
		structural equivalence. i.e., two				
		expressions are either the same			100	
		basic type or formed by		0		
		applying the same constructor to structurally equivalent types.		27		
5	Define Function	Function overloading or method	Remember	CO 4	CLO 13	AIT004.13
5	Overloading?	overloading is the ability to	Remember	0.04	CLU 15	/11/007.13
	g.	create multiple functions of the	1 1			
		same name with different	-			
		implementations.				
6	Explain	Type expression are built from	Understand	CO 4	CLO 13	AIT004.13
	structural	basic types and constructors ,a				
	equivalence of	natural concept of equivalence				
	type expression?	between two type expressions is				
		structural equivalence i.e two				
		expressions are either the same				
		basic type or formed by				
		applying the same constructor to				
7	Explain any two	same equivalent type.	Understand	CO 4	CLO 15	AIT004.15
/	Explain any two uses of type	Depending on Language Type checker can prevent	Understand	004	CLU 15	ATT004.15
	checking?	1)Application of a function to				
	checking:	wrong number of arguments				
		wrong number of arguments				

S.No	QUESTION	ANSWER	Blooms Level	СО	CLO	CLO Code
		2)use of undeclared variables in				
-		expressions		<u> </u>	GT 0 15	1 17000 4 4 5
8	What is flow of	Statements that cause flow of	Remember	CO 4	CLO 15	AIT004.15
	control checks?	control to leave a construct must have some place to which to				
		transfer the flow of control.				
9	What are Type	A type system is a set of rules	Remember	CO 4	CLO 14	AIT004.14
	systems?	for assigning type expressions to				
		the syntactic constructs of a				
10	D (1)	program.		<u> </u>	GT 0 1 1	
10	Define strongly	A strongly typed language is	Remember	CO 4	CLO 14	AIT004.14
	typed language?	one in which the compiler can guarantee that the programs it				
		accepts will run without type	_			
		errors				
11	Define Type	Type Inference are rules that	Remember	CO 4	CLO 14	AIT004.14
	Inference?	determine the type of a language				
		construct based on how it is				
12	What is Dynamic	used. A dynamically typed language is	Remember	CO 4	CLO 15	AIT004.15
12	Typed language?	one in which some of the	Remember	04	CLO 15	AI1004.13
	T JP CO IMIGONGO	constructs of a language can				
		only be typed at run time.				
		Perl, Python, and Lisp are				
10		dynamically typed.		00.4	CI 0 12	A 1700 4 1 2
13	Define Operator overloading?	Operator overloading is a technique by which operators	Understand	CO 4	CLO 13	AIT004.13
	overloading :	used in a programming language				
		are implemented in user-defined				
		types with customized logic that				
		is based on the types of				
1.4	D.C. Astinution	arguments passed	Develo	<u> </u>	CL 0 14	A ITTO0 4 1 4
14	Define Activation trees.	A program consist of procedures, a procedure	Remember	CO 4	CLO 14	AIT004.14
	u ces.	definition is a declaration that,			- C	
	~	in its simplest form, associates				
	0	an identifier (procedure name)			1	
	0	with a statement (body of the				
		procedure). Each execution of			Sec. 1	
	- 7	procedure is referred to as an activation of the procedure.				
15	What are the	a)Each node represents an	Understand	CO 4	CLO 14	AIT004.14
	properties of	activation of a procedure.				
	Activation trees?	b)The root shows the activation				
		of the main function.	1			
		c)The node for procedure 'x' is the parent of node for procedure				
		'y' if and only if the control				
		flows from procedure x to				
		procedure y.				
16	What is Control	Control stack or runtime stack is	Understand	CO 4	CLO 14	AIT004.14
	stack?	used to keep track of the live				
		procedure activations i.e the				
		procedures whose execution have not been completed. A				
		procedure name is pushed on to				
		the stack when it is called				
		(activation begins) and it is				
		popped when it returns				
		(activation ends).				

Activation record? a)local variables b)Temporary values c)Machine status d)Access link c)Control link DReturn value a)local variables b)Temporary values c)Machine status d)Access link c)Control link DReturn value a)local variables b)Temporary values c)Machine status d)Access link c)Control link DReturn value 18 List the various strategies. There are three allocation b) Stack Storage Allocation b) Stack Storage Allocation c) Heap Storage Allocation d) Stack Storage allocation allocation? Remember CO 4 CLO 13 AIT004 19 What is Stack storage allocation allocation? Storage is organised as a stack and activation records sar activation records so they are bound to fresh storage in each activation records so they are bound to fresh storage in each activation cacitication and deallocation can be done at any time and at any place depending on the required Memory allocation and deallocation can be done at any time and at any place depending or der to store information about various entities such as variable names, function names, objects, classes, interfaces, etc. CO 4 CLO 15 AIT004 23 List the various implementation of symbol table. Symbol table can be inplementation of symbol table. A symbol table can be inplementation of symbol table. Remember CO 4 CLO 15 AIT004 24 What are the operations in symbol table. A symbol table Remember CO 4 CLO 15 AIT004 24 What are the operations in symbol table. The	S.No	QUESTION	ANSWER	Blooms Level	СО	CLO	CLO Code
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b) if the name is used in the scope.			-				
scope.							
<i>c)</i> ii uie symbol is initialized.			-				
d)if the symbol declared			<i>, , , ,</i>				
multiple times.			multiple times.				

S.No	QUESTION	ANSWER	Blooms Level	СО	CLO	CLO Code
26	What is scope	A compiler maintains two types	Remember	CO 4	CLO 15	AIT004.15
	management?	of symbol tables: a global				
		symbol table which can be				
		accessed by all the procedures				
		and scope symbol tables that are created for each scope in the				
		program.				
27	Difference	Static:	Remember	CO 4	CLO 14	AIT004.14
	between static	a)Memory is allocated before				
	and Dynamic	the execution of the program				
	allocation.	begins.				
		b)Implemented using stacks.				
		c) In this type of allocation Memory cannot be resized after				
		the initial allocation.				
		Dynamic:				
		a)Memory is allocated during				
		the execution of the program.				
		b)Implemented using heap.				
		c)In this type of allocation				
		Memory can be dynamically				
		expanded and shrunk as				
		necessary.				
28	What is control	Control link points to	Understand	CO 4	CLO 17	AIT004.14
	link and access	activation record of the caller.				
	link?	Access Link is used to refer to non-local data held in other				
		activation records.				
		activation records.				
		UNIT-V				
1	Define Code	UNIT-V The code optimization in the	Remember	CO 5	CLO 16	AIT004.16
1	Define Code Optimization.	UNIT-V The code optimization in the synthesis phase is a program	Remember	CO 5	CLO 16	AIT004.16
1		UNIT-V The code optimization in the synthesis phase is a program transformation technique, which	Remember	CO 5	CLO 16	AIT004.16
1		UNIT-V The code optimization in the synthesis phase is a program transformation technique, which tries to improve the intermediate	Remember	CO 5	CLO 16	AIT004.16
1		UNIT-V The code optimization in the synthesis phase is a program transformation technique, which	Remember	CO 5	CLO 16	AIT004.16
1		UNIT-V The code optimization in the synthesis phase is a program transformation technique, which tries to improve the intermediate code by making it consume fewer resources (i.e. CPU, Memory) so that faster-running	Remember	CO 5	CLO 16	AIT004.16
	Optimization.	UNIT-V The code optimization in the synthesis phase is a program transformation technique, which tries to improve the intermediate code by making it consume fewer resources (i.e. CPU, Memory) so that faster-running machine code will result.		7	4710.	5
1	Optimization.	UNIT-V The code optimization in the synthesis phase is a program transformation technique, which tries to improve the intermediate code by making it consume fewer resources (i.e. CPU, Memory) so that faster-running machine code will result. a)The optimization must be	Remember Understand	CO 5	CLO 16 CLO 16	AIT004.16 AIT004.16
	Optimization. What are the main objectives	UNIT-V The code optimization in the synthesis phase is a program transformation technique, which tries to improve the intermediate code by making it consume fewer resources (i.e. CPU, Memory) so that faster-running machine code will result. a)The optimization must be correct, it must not, in any way,		7	4710.	5
	Optimization. What are the main objectives of code	UNIT-V The code optimization in the synthesis phase is a program transformation technique, which tries to improve the intermediate code by making it consume fewer resources (i.e. CPU, Memory) so that faster-running machine code will result. a)The optimization must be		7	4710.	5
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2	Optimization. What are the main objectives of code	UNIT-V The code optimization in the synthesis phase is a program transformation technique, which tries to improve the intermediate code by making it consume fewer resources (i.e. CPU, Memory) so that faster-running machine code will result. a)The optimization must be correct, it must not, in any way, change the meaning of the program. b)Optimization should increase the speed and performance of the program. c)The compilation time must be kept reasonable. d)The optimization process should not delay the overall compiling process. The optimization process can be		7	4710.	5
2	Optimization. What are the main objectives of code optimization?	UNIT-V The code optimization in the synthesis phase is a program transformation technique, which tries to improve the intermediate code by making it consume fewer resources (i.e. CPU, Memory) so that faster-running machine code will result. a)The optimization must be correct, it must not, in any way, change the meaning of the program. b)Optimization should increase the speed and performance of the program. c)The compilation time must be kept reasonable. d)The optimization process should not delay the overall compiling process. The optimization process can be broadly classified into two types	Understand	CO 5	CLO 16	AIT004.16
2	Optimization. What are the main objectives of code optimization? List the types of	UNIT-V The code optimization in the synthesis phase is a program transformation technique, which tries to improve the intermediate code by making it consume fewer resources (i.e. CPU, Memory) so that faster-running machine code will result. a)The optimization must be correct, it must not, in any way, change the meaning of the program. b)Optimization should increase the speed and performance of the program. c)The compilation time must be kept reasonable. d)The optimization process should not delay the overall compiling process. The optimization process can be broadly classified into two types a)Machine-Independent	Understand	CO 5	CLO 16	AIT004.16
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S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
	optimization techniques?	b)Common sub-expression elimination c)Dead Code Elimination Code Movement d)Strength Reduction				
5	Define Machine independent optimization	In this optimization, the compiler takes in the intermediate code and transforms a part of the code that does not involve any CPU registers and/or absolute memory locations.	Understand	CO 5	CLO 17	AIT004.17
6	Define Machine dependent optimization	Machine-dependent optimization is done after the target code has been generated and when the code is transformed according to the target machine architecture. It involves CPU registers and may have absolute memory references rather than relative references.	Remember	CO 5	CLO 20	AIT004.20
7	List the different loop optimization techniques.	There are three techniques: a)Code motion b)Induction-variable elimination c)Reduction in strength	Understand	CO 5	CLO 16	AIT004.16
8	What are function preserving transformations?	The transformations are Sources of Optimization a)Common Subexpression Elimination b)Copy Propagation c)Dead-Code Elimination d) Constant Folding	Understand	CO 5	CLO 17	AIT004.17
9	What is common sub expression elimination?	An occurrence of an expression E is called a common sub expression if E was previously computed, and the values of variables in E have not changed since the previous computation we can avoid recomputing the expression if we can use the previously computed value.	Remember	CO 5	CLO 17	AIT004.17
10	Define copy propagation.	Assignments of the form $f := g$ called copy statements, or copies for short. The idea behind the copy-propagation transformation is to use g for f, whenever possible after the copy statement f: = g. Copy propagation means use of one variable instead of another.	Remember	CO 5	CLO 17	AIT004.17
11	What is Dead code elimination?	A variable is live at a point in a program if its value can be used subsequently; otherwise, it is dead at that point. A related idea is dead or useless code, statements that compute values that never get used.	Remember	CO 5	CLO 17	AIT004.17

S.No	QUESTION	ANSWER	Blooms Level	СО	CLO	CLO Code
12	What is constant	Deducing at compile time that	Remember	CO 5	CLO 17	AIT004.17
	folding?	the value of an expression is a				
		constant and using the constant instead is known as constant				
		folding.				
13	What is loop	In loops, especially in the inner	Remember	CO 5	CLO 16	AIT004.16
	optimization?	loops, programs tend to spend				
		the bulk of their time. The				
		running time of a program may be improved if the number of				
		instructions in an inner loop is				
		decreased, even if we increase				
		the amount of code outside that				
1.4		loop.	D I	005		
14	Define code motion.	Code motion is used to decrease the amount of code in loop. This	Remember	CO 5	CLO 16	AIT004.16
	motion.	transformation takes a statement				
		or expression which can be				
		moved outside the loop body				
		without affecting the semantics of the program				
15	Define	Strength reduction is used to	Remember	CO 5	CLO 16	AIT004.16
	Reduction in	replace the expensive operation				
	strength.	by the cheaper once on the				
		target machine. Addition of a constant is				
		Addition of a constant is cheaper than a multiplication.				
		So we can replace multiplication				
		with an addition within the loop.				
16	What is Basic Block?	A number of sequences are	Understand	CO 5	CLO 17	AIT004.17
	DIOCK ?	included in the source codes, which are executed in sequence				
		and are termed as the basic				
		blocks of the code. When the			1.1	
	0	first instruction is executed, all the instructions of the same			C	>
		basic block are executed in the				
		sequence of appearance by not			~	
	C	losing the program flow control.			-	
17	What are the	a) They do not contain any kind	Remember	CO 5	CLO 17	AIT004.16
	characteristics of basic block?	of jump statements in them. b) There is no possibility of				
	Subie block:	branching or getting halt in the		~		
		middle.				
		c) All the statements execute in				
		the same order they appear.d) They do not lose the flow				
		control of the program.				
18	Define Flow	A flow graph is a directed graph	Remember	CO 5	CLO 17	AIT004.17
	graph.	with flow control information				
19	How to	added to the basic blocks. a)All the statements that follow	Understand	CO 5	CLO 17	AIT004.16
17	determine basic	the leader (including the leader)	Chucistanu	005		/11/007.10
	block.	till the next leader appears form				
		one basic block.				
		b)The first statement of the code called as the first leader.				
		c)The block containing the first				
		leader is called as Initial block.				

S.No	QUESTION	ANSWER	Blooms Level	СО	CLO	CLO Code
20	How to	a)First statement of the code.	Understand	CO 5	CLO 17	AIT004.17
	determine leader	b)Statement that is a target of				
	statement in	the conditional or unconditional				
	basic block.	goto statement.				
		c) Statement that appears				
		immediately after a goto				
		statement.				
21	Define Induction	A variable x is an Induction	Remember	CO 5	CLO 20	AIT004.20
	variable.	Variable of a loop if every time				
		the variable x changes values, it				
		is incremented or decremented				
		by some constant				
22	List the types of	There are two type of basic	Remember	CO 5	CLO 17	AIT004.17
	basic block	block optimization.				
	optimization.	a)Structure-Preserving				
		Transformations	Second Second		1	
		b)Algebraic Transformations		~~ ~	GT 0 1	
23	List the	a)Common sub-expression	Understand	CO 5	CLO 17	AIT004.17
	Structure-	elimination				
	Preserving Transformation	b)Dead code elimination				
		c)Renaming of temporary				
	on basic blocks.	variables				
		d)Interchange of two independent adjacent statements				
24	What are	In the algebraic transformation,	Remember	CO 5	CLO 20	AIT004.20
24	Algebraic	we can change the set of	Keinenider	05	CLO 20	A11004.20
	transformations?	expression into an algebraically				
	transformations:	equivalent set. Thus the				
		expression $x = x + 0$ or $x = x * 1$				
		can be eliminated from a basic				
		block without changing the set				
		of expression.				
25	What is Directed	Directed Acyclic Graph (DAG)	Remember	CO 5	CLO 20	AIT004.20
	Acyclic graph?	is a tool that depicts the				
		structure of basic blocks, helps			- C	
		to see the flow of values flowing				
		among the basic blocks, and			1	
		offers optimization too. DAG				
		provides easy transformation on			Sec. 1	
		basic blocks.				
26	What is code	This is the final phase of	Remember	CO 5	CLO 18	AIT004.18
	generation	compilation. which takes input				
		as a optimized code and convert	100	~		
		in to machine/assembly				
27	T : 1 ·	language.		<u> </u>		
27	List the code	There are two descriptors:	Remember	CO 5	CLO 18	AIT004.18
	generator	a)Register descriptor				
20	descriptors.	b)Address descriptor	Understand	CO 5	CLO 18	A ITO0 / 10
28	What is peephole	This optimization technique	Understand	005	CLU 18	AIT004.18
	optimization?	works locally on the source code				
		to transform it into an optimized code. By locally, we mean a				
		small portion of the code block				
		at hand. These methods can be				
		applied on intermediate codes as				
		well as on target codes.				
29	What is	Unreachable code is a part of the	Remember	CO 5	CLO 18	AIT004.18
29	Unreachable	program code that is never	Remember	005		111007.10
	code?	accessed because of				
		programming constructs.				
L		Programming constructs.			1	

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		Programmers may have				
		accidently written a piece of				
		code that can never be reached				
30	What is register	Selecting the set of variables	Understand	CO 5	CLO 20	AIT004.20
	allocation and	that will reside in registers at				
	assignment?	each point in the program				
		Picking the specific register that				
		a variable will reside in it.				

Signature of the Faculty

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