Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II (Old course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 1720103 **Date:14/05/2015**

Subject Name: Advance Compiler Design

Time: 02:30 pm to 5:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Define: Compiler, Interpreter, Source program, Target program, Assembler, Linker, Loader. **07**

(b) Construct DFA without constructing NFA for following regular expression: **07**

(a | b) * (b | c) * a*#

Q.2 **(a)** Construct the operator precedence relations for the string id+id*id using the following precedence functions. **07**

	+	-	*	/	^	(	)	id	$
f	2	2	4	4	4	0	6	6	0
g	1	1	3	3	5	5	0	5	0

(b) Give example of 3 lexical errors in a C program. **03**

Give example of 3 syntax errors in a C program. **03**

Give example of 1 semantic error in a C program. **01**

OR

(b) Construct DFA from NFA by subset construction method. **07**

(a | b)* | (ab)*b

Q.3 **(a)** 1. Write regular expression that describe following language. **03**

(i) All strings over {a,b} that are even in length.

(ii) All words that contain exactly three b's in total.

(iii)Only those words that have an even number of letters total.

2. Define: token, pattern, lexeme, sentinel. **04**

(b) Write Yacc specifications to check the balanced parenthesis in string of alphabets. **07**

OR

Q.3 **(a)** Write Lex specifications to perform following actions on some program file/fragment. **07**

1. Count the number of comment lines.
2. Replace all non-null sequences of white spaces by a single blank character.
3. Replace all integer numbers by hexadecimal numbers.

(b) Write a short note on Loop Optimization. **07**

Q.4 **(a)** Define LL(1) grammar. Is following grammar LL(1)? Justify. **07**

S Ÿ (L) | a

L Ÿ L , S | S

(b) Construct SLR parsing table for following grammar. **07**

S Ÿ 0 S 0 | 1 S 1

S Ÿ 1 0

OR

Q.4 **(a)** Write unambiguous production rules for arithmetic expression consisting of following operators: +, - (binary), - (unary), ( ), *, /, ^ (exponent). **07**

Draw parse tree for following : id * id + (id ^ id ^ id) * id * id

(b) Write a short note: global data flow analysis. **07**

Q.5	**(a)**	What is short circuit code? Write down syntax directed definition for the following flow of control statements S-> if E then S1 | if E then S1 else S2 | while E do S1	**07**
	(b)	What is DAG? How does it differ from syntax tree? Draw syntax tree and DAG for the following expression a + a ∗ (b ï c) + (b ï c) ∗ d	**07**

OR

Q.5	**(a)**	Write short notes on Structure preserving transformation in Basic blocks.	**07**
	(b)	Construct syntax tree and DAG for following: a = b * c + b * c * d ï c * d Write three address codes for the same.	**07**

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