Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER • 2013

Subject code: 1720103 **Date: 31-12-2013**

Subject Name: Advance Compiler Design

Time: 10.30 am – 01.00 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)** Explain the different phases of a compiler, showing the output of each phase, using the example of the following statement position : = initial + rate * 60 **07**

(b) Define the following terms: **07**

1. Parse tree
2. Ambiguity
3. Token
4. Pattern
5. Lexeme
6. Synthesized Attribute
7. Directed Acyclic Graph

Q.2 **(a)** Explain how input buffering helps lexical analyzer in compilation process? Give the difference between postfix operator + and ? **07**

(b) Draw NFA N for (a| b) *abb. Convert it into DFA **07**

OR

(b) What is LEX? Explain, in detail, different sections of LEX program and model of LEX Compiler **07**

Q.3 **(a)** Construct LALR parsing table for the grammar, **07**
S'-> S, S-> CC, C-> cC | d

(b) Construct LL(1) Parsing table for the following grammar, S-> iEtSS' / a **07**
S'->eS / ϵ
E->b

OR

Q.3 **(a)** Construct the operator precedence relations for the string id+id*id and also construct the precedence graph 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) Explain Model of LR parser. Construct canonical LR(0) collection for grammar, **07**
E -> E+T | T, T-> T*F | F, F-> (E) | id

Q.4 **(a)** Explain Type Checking of Expression and Statement and also describe general activation record **07**

(b) Explain parameter passing methods and YACC **07**

OR

Q.4	**(a)**	What do you mean by three address code? Construct Quadruples & Triples of the expression, a:= b * -c + b * -c	**07**
Q.4	**(b)**	Explain Dangling References & Heap storage allocation strategy	**07**
Q.5	**(a)**	Explain different principal sources of optimization technique with suitable examples	**07**
	(b)	Discuss the issues in the design of a code generator	**07**
		OR	
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)	Explain register allocation & assignment	**07**

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