Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. Sem. – II[nd] - Examination – June/July- 2011

Subject code: 1720103

Subject Name: Advance Compiler Design

Date:27/06/2011 **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)**	Answer the following. Write regular definition(Regular Expression) for (i) Set of Strings of 0's and 1's not containing 101 as a substring. (ii) Set of strings of 0's and 1's with an even number of 0's and odd number of 1's.	**14**
	(b)	Define: S-attribute, L-attribute, SDD	
	(c)	Define: Token, Pattern and Lexeme with proper example.	
	(d)	Difference between parse tree and syntax tree.	
Q.2	**(a)**	Define LL(1) grammar. Is following grammar LL(1)? Justify. S → (L) | a L → L , S | S	**07**
	(b)	Show that following grammar is LL (1) but not SLR (1). S → AaAb | BbBa A→ ϵ B→ ϵ	**07**
		OR	
	(b)	Show that following grammar is LALR(1) but not SLR (1). S → Aa | bAc | dc | bda A → d	**07**
Q.3	**(a)**	Find LR(1) items for the following grammar. S → Aa | aAc | Bc | bBa A → d B → d	**07**
	(b)	Answer the following. (i)What is Left factoring grammar? Explain it with example. (ii) How to perform loop optimization? Explain.	**07**
		OR	
Q.3	**(a)**	Construct SLR parse table for following grammar. E → E + T | T T →T F | F F → F *| a | b	**07**
	(b)	Answer the following. (i)Define Left recursion. How to eliminate left recursion? (ii) Explain peephole optimization. Give its characteristics.	**07**

Q.4 Answer the following. **14**

(a) Discuss the different issues in the design of Code Generator.

(b) What is 3-address code? Explain types of 3-address statements.

(c) Construct DFA from NFA by subset construction method and Optimized DFA

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

OR

Q.4 Answer the following. **14**

(a) What is intermediate code? Explain Intermediate Code Generation.

(b) Give importance and structure of Symbol Table. How is the symbol tale manipulated at various phases of compilation?

(c) Construct DFA from Regular expression and Optimized DFA

(0 / 1)*10*10*

Q.5 **(a)** Add semantic rules in following Grammar **06**

E → E + T | T

T → num . num | num

(b) Write short notes on following. **08**

(i)Liveness Analysis.

(ii)Register Allocation with graph coloring.

OR

Q.5 **(a)** Is the following grammar ambiguous? Give reason. **03**

S → aS | aSbS | c

(b) Which factors influences the number of passes in compiler? **03**

(c) Write short notes on following. **08**

(i)Structure preserving transformation in Basic blocks.

(ii)Lexical Analysis using “lex”.

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