Seat	No.	
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Enrolment No.

## **GUJARAT TECHNOLOGICAL UNIVERSITY**

BE - SEMESTER-VII (NEW) - EXAMINATION - SUMMER 2017

Subject Code: 2170701 Date: 29/04/2017

**Subject Name: Complier Design** 

Time: 02.30 PM to 05.00 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 Semantic analysis and Syntax analysis phases of compiler with suitable example. Also explain the errors generated by these two phases.
  - (b) Construct the NFA using thompson's notation for following regular expression and then convert it to DFA.

(a / b)\* ab#

Q.2 (a) Check following grammar is LL (1) or not?

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S -> aB | €

B -> bC | €

- C -> cS | €
- **(b)** What is left factoring and left recursion? Explain it with suitable example.

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OR

**(b)** Construct CLR parsing table for following grammar.

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- $S -\!\!> aSA \mid \! \in$
- $A \rightarrow bS \mid c$
- **Q.3** (a) Show that following grammar is not a SLR (1) grammar.

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S -> AaBa | BbBa

- A ->€
- B ->€
- **(b)** Develop a syntax directed definition for following grammar.

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E -> TE'

- E' -> +TE' | €
- $T \rightarrow (E)$
- $T \rightarrow id$

OR

- Q.3 (a) Write a grammar to declare variables with data type int or float or char. Also develop a syntax directed definition for that. Draw the dependency graph for same
  - 1 0=
  - **(b)** Define operator precedence grammar. Construct precedence matrix and precedence graph for arithmetic grammar as shown below:

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- $E -> E + T \mid T$
- $T \rightarrow T * F | F$
- $F -> (E) \mid id$
- **Q.4** (a) Explain Activation record and Activation tree in brief.

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(b) Explain Quadruple, triple, and indirect triple with suitable example.

OR

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Q.4 (a) Write a note on peephole optimization.(b) Write a short note on symbol table management.

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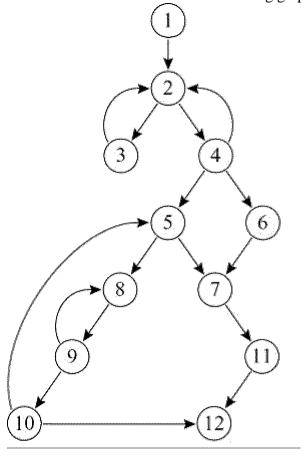
Q.5 (a) Define a following: Basic block, Constant folding, Natural loop, Handle

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(b) Construct DAG for a + a \* (b-c) + (b-c) \* d. also generate three address code for same.

OR

- Q.5 (a) Discuss the issues in the design of code generation.
  - (b) Define dominators. Construct dominator tree for following graph. 07



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