Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE – SEMESTER – VI EXAMINATION – WINTER 2015**

**Subject Code:160706 Date:11/12/ 2015**

**Subject Name: System Programming**

**Time:2:30pm to 5:00pm 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)** | List out all phases of a language processor. Explain first three phases of it. | **07** |
| | **(b)** | Explain Left recursion and Left factoring by stating its general production rules & suitable grammar examples. | **07** |
| **Q.2** | **(a)** | Write unambiguous production rules to produce arithmetic expression consisting of +, - , *, / and ^ (exponent). Construct parse tree and abstract syntax tree for : id * id + id ^ id - id / id | **07** |
| | **(b)** | Construct DFA for following regular expression: (a \| b)* abb (a \| b)* # | **07** |
| | | **OR** | |
| | **(b)** | Given a grammar, E → TX X → +TX \| ε T → FY Y → *FY \| ε F → id \| (E) Develop LL(1) parsing table and parse a string (id + id) * id | **07** |
| **Q.3** | **(a)** | Explain working of operator precedence parser by giving suitable example. | **07** |
| | **(b)** | Explain analysis and synthesis phases of an assembler in detail. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Discuss various intermediate code representations for an assembler. | **07** |
| | **(b)** | Explain various data structures (tables) needed in PASS I of the assembler with their fields. Also explain various data structures used for symbol table. | **07** |
| **Q.4** | **(a)** | Illustrate nested calls for any two macros of your choice with its corresponding expansion. | **07** |
| | **(b)** | Explain advanced macro facilities using appropriate example. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain absolute loader in detail. | **07** |
| | **(b)** | Explain design of a linker with its issues of relocation and linking. | **07** |
| **Q.5** | **(a)** | Explain and differentiate one pass and two pass compilers. | **07** |
| | **(b)** | Explain various optimizing transformations of a compiler using appropriate examples. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | What is an overlay? Explain overlay structured program and its execution. | **07** |
| | **(b)** | Discuss parameters for activation records. | **07** |

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