

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 : **07**
$$\text{id} * \text{id} + \text{id} \wedge \text{id} - \text{id} / \text{id}$$

(b) Construct DFA for following regular expression: **07**
$$(a | b)^* abb (a | b)^* \#$$
- OR**
- (b) Given a grammar, **07**
$$\begin{array}{ll} E \rightarrow TX & X \rightarrow +TX \mid \epsilon \\ T \rightarrow FY & Y \rightarrow *FY \mid \epsilon \end{array} \quad F \rightarrow \text{id} \mid (E)$$

Develop LL(1) parsing table and parse a string $(\text{id} + \text{id}) * \text{id}$
- 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**
