

Department of Computer Science & IT
The Islamia University of Bahawalpur

Final-Term Exam

Date: 16 Jan. 2018

BSCS - 7th semester (CSIT – 02701)

Subject: Compiler Construction

Course Instructor: Dr. Nadeem Akhtar

Marks: 50

Time: 2 hour.

Q1. Differentiate between the following terms

1. Environment and State.
2. Call by Value and Call by Reference.
3. Static Scope and Dynamic Scope.
4. Static Variable and Dynamic Variable.

(10)

Q2. Define the Syntax Directed Definition.

Write a Syntax Directed Definition (SDD) for infix to postfix translation. By using this SDD create an annotated parse tree of expression: $9 - 5 + 2$

(2 + 5.5 = 7.5)

Q3. Define Syntax Directed Translation Schema.

Write a Syntax Directed Translation Scheme for translating arithmetic expression from infix to postfix notation. Translate the following expression: $10 - 6 + 3$

(2 + 5.5 = 7.5)

Q4. Consider the Context-Free Grammar

$$S \rightarrow SS^+ \mid SS^* \mid a$$

- (a) Show how the string aa^+a^* can be generated by this grammar
- (b) Construct a parse tree for this string

(4 + 3.5 = 7.5)

Q5. Construct Finite Automata (FA) for the following Regular Expressions: where $\Sigma = \{a, b\}$

- (1) $a|abb|a^*b^+$ (2) $(a|b)^+a(a|b)^*$

(4 + 3.5 = 7.5)

Q6. Write a left-associative CFG for the Arithmetic operations (Addition - Subtraction - Multiplication - Division).

Using this CFG create a parse-tree for the expression: $9 / 3 - 30 \times 10$

(10)