

Department of Computer Science & IT
The Islamia University of Bahawalpur

Mid-Term Exam

BSCS - 7th semester (CSIT – 01702)

Course Instructor: Dr. Nadeem Akhtar

Date: 21 Nov. 2017

Subject: Compiler Construction

Time: 1 hour 15 min.

Q1. a) Define Symbol table. Write its role. Give an example.

b) Draw a labelled diagram of the Java Language Processing System.

(2.5 + 2.5 = 5)

Q2. a) Name the phases of the structure of a Compiler. Describe the role of each phase.

b) Differentiate between a Regular Expression and Regular Definition.

Note: Both are used for the definition of lexeme patterns.

(4 + 1 = 5)

Q3. Consider the following source code statement:

*force = mass * acceleration - 55*

where *force*, *mass* and *acceleration* are floats, and 55 is integer

Construct the lexemes, tokens, Syntax tree, Semantic tree, Intermediate code, Code optimization, Assembly language code.

(5)

Q4. Let $\Sigma = \{0, 1\}$.

Describe precisely the languages generated by the following Regular Expressions

(i) $1^+(00)^*1$

(ii) $010(0 | 1)^*$

(5)

Q5. Consider the regular expression: $01(0 | 1)^*0$ where $\Sigma = \{0, 1\}$

Draw a Finite Automata recognizing the regular language generated by the above regular expression. Write its transition functions.

(5)

Q6. Write a Context-Free Grammar for the Addition, Subtraction, Multiplication, and Division of digits (0 to 9). A Grammar that enforces precedence of operators, and is left associative.

By using your grammar construct a Syntax Tree of the following expression:

$9 + 2 * (5 - 3)$

(5)