National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Compiler Construction	Course Code:	
	Program:	BS (CS)	Semester:	Fall 2019
	Duration:	60 Minutes	Total Marks:	30
	Paper Date:	25-Sep-2019	Weight	
	Section:	ALL	Page(s):	3
	Exam Type:	Midterm-1		

Student : Name:_____ Roll No._____
Section:_____

Question 1 (10 marks) Answer the following MCQ's:

i. Compiler provides
   a) Fast execution
   b) Portability (platform independence)
   c) Better debugging
   d) Source code protection
   e) Both (a) and (d)

ii. Interpreter provides
   a) Fast execution
   b) Portability
   c) Better debugging
   d) Source code protection
   e) Both (b) and (c)

iii. Hybrid system provides
   a) Portability
   b) Better debugging
   c) Source code protection
   d) Better execution time
   e) All of above

iv. Following phases populate the symbol table
   a) Lexical analyzer
   b) Syntax analyzer
   c) Semantic Analyzer
   d) Both (a) and (b)
   e) Both (a) and (c)

v. Two different parse trees for a single input means
   a) Ambiguous grammar
   b) Ambiguous tree
   c) Efficiency
   d) Context free language
   e) Left recursion

vi. Lexical analyzer converts
   a) Characters into words
   b) Words into sentences
   c) Tokens into lexemes
   d) Lexemes into tokens
   e) Words into regular expressions

vii. Syntax analyzer converts
   a) Characters into words
   b) Words into sentences
   c) Parse trees into DFA's
   d) CFG into program
   e) PDA into CFG

viii. Type checking is performed by
   a) Lexical analyzer
   b) Syntax analyzer
   c) Semantic analyzer
   d) Intermediate code generator
   e) Virtual machine

ix. Following phase captures syntax errors
   a) Lexical analyzer
   b) Syntax analyzer
   c) Semantic analyzer
   d) Intermediate code generator
   e) Virtual machine

x. A regular expression cannot include
   a) Kleene star
   b) Operator or
   c) Concatenation
   d) Parenthesis
   e) Recursion

Question 2 (5+5 marks)

a) Give regular definition for a date. A date shall consist of two digits, three-letters, and four digits, separated by dashes. For example 23-Sep-2019.

b) Give a DFA accepting the following language over {a, b}: The set of all strings whose fifth symbol from the right end is a "b".

Question 3 (5+5 marks)

a) Rewrite the following grammar to set the precedence of "and" higher than that of "or". The precedence of parenthesis shall be highest.

```
E -> E and E | E or E | ( E ) | true | false
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b) Give an <u>unambiguous</u> CFG to generate all possible pairs of balanced parenthesis. Following are few examples:

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(), ()(), ()(()), ...
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