ersity of Computer & Emerging Sciences, Karachi
Fall-2025 CS-Department
Quiz 1

Course Code: CS3001	Course Name: Theory of Automata
Instructor Names: Bakhtawar	
Studer	Section No:

QUESTION # 01 – Introduction - Alphabets, Symbols & Languages **CLO1** **[4 points]**

a) Identify & give reasons whether the following symbols are valid or invalid for automata. **[2 points]**

i) $\Sigma = \{A, C, DB, B\}$

ii) $\Gamma = \{\pi, \alpha, \beta, \mu\}$

b) For an alphabet $\Sigma_2 = \{A, BC, CC, D, E\}$, the language L_1 contains all the words of length=3 and L_2 contains all the words having double letters/symbols. Identify from the given below strings that belong to L_1 or L_2 & state from which language does it belong. **[02 points]**

1) CCB

2) BBCCCE

c) Write the reverse strings of the valid words, by considering $\Sigma_2 = \{A, BC, CC, D, E\}$ **[02 points]**

QUESTION # 02 – Regular Expressions **CLO2** **[8 points]**

a) Write the regular expressions of the following languages. **[6 points]**

i) All strings that contains at least two B and |w| is 2 mod 3. [$\Sigma = \{A,B,C\}$]

ii) RE that accept a simple URL like https://example.com

iii) Should contain at least one double letter having alphabet set{a,b}

b) Give descriptions of the languages from the following regular expressions. Also give some(3-4) words these languages. where, $\Sigma = \{a,b\}$ **[2 points]**

$RE_1 = (a+b)^* a(a+b)^* b(a+b)^* + (a+b)^* b(a+b)^* a(a+b)$

QUESTION # 03 – AUTOMATA Construction **CLO3** **[2*4 p**

Design a DFA which accepts set of string such that every string containg '00' as a substring but not '000' substring.

Design DFA which accepts strings in which every '00' is followed immediately by '1'

Design a DFA for language, contain strings in which left most symbol differ from right most symbol.

Design a machine which checks whether a given decimal number is "Even" having alphabet set{0,1,2,

Best of Luck....!