# CS701 – Theory of Computation

**Assignment No.2 Solution**

### Maximum Marks: 50

***Due Date: 21 December 2020***

**Instructions**

The purpose of this assignment is to give your hands-on practice. It is expected that students will solve the assignment themselves. The following rules will apply during the evaluation of the assignment.

* Cheating from any source will result in zero marks in the assignment.
* Any student found cheating in any of the two assignments submitted would be awarded "F" grade in the course.
* No assignment after due date will be accepted through email

## Question No. 1 (15+10 = 25 marks)

**Part 1.** Find out the possible match of following domino of Post Correspondence Problem (PCP). Show that the arrangements of domino, if it is matched otherwise prove that if it is not matched.

{ [z/y], [zyz/z], [y/yyz]}

Solution:

No, it is not possible.

If we start with pair3, pair2 will never be used, so with only pair3 and pair1, there is no solution.

Same is the case when we start with pair2.

**Part 2.** Suppose M be Linear bounded automata (LBA) that have 12 states and 6 tape symbols. How many distinct configurations can we have for a tape of length 2?

Let M be an LBA with q states and g tape symbols. There are at most qngn distinct configurations of M for a tape of length n.

The machine can be in any 12 states.

2 Its head can be scanning any tape cell. 6 possibilities.

3

1 Cell 1 can have any symbol (6 possibilities).

2 Cell 2 can have any symbol (6 possibilities).

3 Cell 2 can have any symbol (6 possibilities).

So there are a total of 12 × 2 × 62 distinct configurations.

**Question No. 2 (15+10 = 25 marks)**

Read the research paper entitled **“Fuzzy Turing Machines: Variants and Universality”** and answer the following questions:

* 1. How can you describe tuples of deterministic fuzzy Turing machines (DFTMs) and nondeterministic fuzzy Turing machines (NFTMs)? As discussed in the paper?

As review

* 1. How can differentiate between DFTM and NFTM? Elaborate it critically in your own words.

As review

### Please download above Research paper that has attached with an assignment zip file.

### Note: Plagiarism will be checked for each question. Please answer the questions in your own words and marks will be awarded based on your answer and plagiarism report.

For any query about the assignment, contact at [CS701@vu.edu.pk](mailto:CS701@vu.edu.pk)