Assignment 1

The due date for submitting this assignment has passed. As per our records, you have not submitted this assignment.

Due on 2020-02-12, 23:59 IST.

1. Consider a language $L = \{a^n | n \text{ is prime}\} \subseteq \{a\}^*$ for some symbol $a$. Which of the following options is true for $L$?
   - $L$ is regular but not context-free language.
   - $L$ is context-free but not regular.
   - $L$ is neither regular nor context-free but accepted by a Turing machine.
   - None of the above.

   No, the answer is incorrect. Score: 0

Accepted Answers: $L$ is neither regular nor context-free but accepted by a Turing machine.

2. Consider a $3 \times 3$ matrix $A$ such that for all $i, j \in [3]$, $A_{i,j} = 3$ i.e., all the 9 elements of matrix $A$ are 3. Then what will be permanent of matrix $A$?
   - 0
   - 6
   - 162
   - 0

   No, the answer is incorrect. Score: 0

Accepted Answers: 162

3. Define $g = 2^2x_1x_2x_3 \cdots x_n$. Which of the following statements is true?
   - $g$ has poly(n) size circuit and is in VP.
   - $g$ has poly(n) size circuit but is not in VP.
   - $g$ does not have a poly(n) size circuit and hence is not in VP.
   - None of the above.

   No, the answer is incorrect. Score: 0

Accepted Answers: $g$ has poly(n) size circuit but is not in VP.

4. Consider a $3 \times 3$ matrix $A$ such that for all $i, j \in [3]$, $A_{i,j} = i + j$.
   - Then what will be determinant of matrix $A$?
     - 0
     - 3
     - 6
     - 9

   No, the answer is incorrect. Score: 0

Accepted Answers: 6

5. Identify the circuits and formulas from the following representations.

   - C1
     - $C_1$ is a circuit but $C_1$ and $C_3$ are formulas.
     - $C_1$ is a circuit but $C_2$ and $C_3$ are formulas.
     - $C_2$ is a formula but $C_2$ and $C_3$ are circuits.

   - C2
     - $C_2$ is a formula but $C_1$ and $C_3$ are circuits.

   - C3
     - $C_3$ is a circuit but $C_2$ and $C_3$ are formulas.
     - $C_2$ is a circuit but $C_1$ and $C_3$ are circuits.