Assignment 3

The due date for submitting this assignment has passed.

Due on 2021-02-10, 23:59 IST.

As per our records you have not submitted this assignment.

1) Recall Razborov-Smolensky theorem which says that for primes $p \neq q$, $\mathrm{mod}_p \notin \mathrm{ACC}^0[q]$. Which of the following option is one of the reasons for the requirement of primality? *1 point*

- If q is composite then there exist polynomials in Fq [x1, ... , xn] of degree at most √n that agrees with modp on more than 99% of inputs.
- Approximated polynomial agrees with the circuit on very small fraction of inputs.
- modq gates in given circuit cannot be approximated correctly without Fermat's little theorem which holds only for primes.
- Primality requirement is not needed. It holds for all p,q.

No, the answer is incorrect.
Score: 0

Accepted Answers:
modq gates in given circuit cannot be approximated correctly without Fermat's little theorem which holds only for primes.

2) Consider the following two statements. *1 point*
S1: There exists problems that cannot be solved by any Turing Machine.
S2: There are un-computable problems solvable by a circuit family.
Choose the appropriate option.

- S1 is true, S2 is true.
- S1 is true, S2 is false.
- S1 is false, S2 is true.
- S1 is false, S2 is false.

No, the answer is incorrect.
Score: 0

Accepted Answers:
S1 is true, S2 is true.

3) Assuming EXP $\subseteq$ P/poly we can prove that EXP = Σ_2. Then which of the following relation among complexity classes directly hold true? *1 point*

- $\mathrm{P/poly} \subseteq \mathrm{EXP}$
- $\mathrm{PSPACE} \subseteq \mathrm{P/poly}$
- $\mathrm{PSPACE} = \Sigma_2$
- Both option (b) and (c)

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both option (b) and (c)

4) Consider a 3×3 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? *1 point*

- 8
- 6
- 162
- 0

No, the answer is incorrect.
Score: 0

Accepted Answers:
162

5) Let F be a field of order 2^n where n is a positive integer. Then which of the following is true. *1 point*

- char F = 2^n
- char F = 2^p for some prime p which divides n.
- char F = 0
- char F = 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
char F = 2