INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR
Algorithmic Game Theory 2020-21: Assignment-1

Deadline: 11:55pm, 21st Sept 2020
Full Marks: 20
Subject No: CS60025
Subject: Algorithmic Game Theory
Department/Center/School: COMPUTER SCIENCE AND ENGINEERING

Answer all the questions.

1. **Compute all MSNE of the following two-player game (without using calulator).**

   ▷ **The set of players** $(N) : \{1, 2\}$

   ▷ **The set of strategies:** $S_1 = S_2 = \{A, B, C\}$

   ▷ **Payoff matrix:**

		Player 2		
		A	B	C
Player 1	A	$(1, -1)$	$(-1, 1)$	$(2, -\frac{1}{e})$
	B	$(-1, 1)$	$(1, -1)$	$(3, -\sqrt{\pi})$
	C	$(-0.59, 3)$	$(-\frac{1}{\pi}, 6)$	$(2, 103)$

[10 Marks]

2. **Prove or disprove the following statement.**

   ▷ **Let $A \in \mathbb{R}^{m \times n}$ be a matrix such that the sum of the entries of every row and column is 0. Then the value of the matrix game A is 0.**

[10 Marks]