INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR
Algorithmic Game Theory 2020-21: First Class Test
Set #2

Date of Examination: 12 September 2020
Duration: 1 hour (for writing answers) + 10 minutes (for taking photos, concatenating, and uploading to moodle)
Full Marks: 20
Subject No: CS60025
Subject: Algorithmic Game Theory
Department/Center/School: COMPUTER SCIENCE AND ENGINEERING
Special instruction (if any): You do not need to prove anything that is already proven in the class.

Answer all the questions.

1. Let the last two digits of your roll number be $d_1 d_0$. Let $d = 10d_1 + d_0$. Compute all pure and mixed strategy Nash equilibriums of the following two player game.

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

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

   ▷ Payoff matrix:

		Player 2		
		X	Y	Z
Player 1	A	(d, d)	$(0, 0)$	$(19, -7)$
	B	$(0, 0)$	$(1, 1)$	$(7, -1)$
	C	$(-1, 43)$	$(-0.5, 2)$	$(6, 7)$

[10 Marks]

2. Let the last digit of your roll number be d. Give an example of an infinite game which has exactly d PSNEs.

[5 Marks]

3. Let the last digit of your roll number be d. Give an example of a $(2 + d)$-player finite normal form game which has a weakly dominant strategy equilibrium but does not have a strongly dominant strategy equilibrium.

[5 Marks]