Your anonymous identification code:

Instructions

- The exam consists of 18 statements, of which some are true (correct) and some are false (wrong). We don't specify how many are true or false.
- The 18 statements are divided into groups, where each group has some background information that is common to all the statements in the group.
- Your exam score is calculated as follows. Correct answers (i.e, true statements marked as true, and false statements marked as false) are awarded 1 point. Wrong answers (i.e., true statements marked as false, and false statements marked as true) give 1 point deduction. Statements that you do not mark never give any points, positive or negative.
- The maximum score is +18 and the minimum is −18. You must be awarded at least +6 points to pass the exam. Your exam score contributes directly to your total course score that is used to calculate your grade on the course (i.e., the exam contributes at most 18 points to your course score).
- You may only use a pen or pencil and an eraser. Specifically, no electronic equipment, no books, and no notes are allowed.
- Feel free to make notes or calculations on the form or on the provided extra paper.

The form will be read by a machine. Please mark clearly with a pen or pencil.
Check: ☒
Uncheck to correct: ■

1001

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1

Consider a two-player simultaneous action game, where player I has actions A and B and player II has actions C and D. The payoffs are given by

	C	D
A	(10, 10)	(8, 11)
B	(11, 8)	(9, 9)

1.1 This is a coordination game.

☐ True ☐ False

1.2 This game has one mixed strategy Nash equilibrium and one pure strategy Nash equilibrium.

☐ True ☐ False

1.3 The pure strategy D is evolutionarily stable (in the strict sense).

☐ True ☐ False

1.4 The pure strategy profile where player I always plays B and player II always plays C is Pareto optimal.

☐ True ☐ False

1.5 The pure strategy profile where player I always plays B and player II always plays D is Pareto optimal.

☐ True ☐ False

1.6 This game can be represented in extensive form.

☐ True ☐ False

1.7 This is a game of imperfect information.

☐ True ☐ False

1.8 The game has infinitely many action profiles.

☐ True ☐ False

2

Consider a two-player simultaneous action game, where player I has actions A and B and player II has actions C and D. The payoffs are given by

	C	D
A	(3, 2)	(0, 0)
B	(0, 0)	(2, 3)

With this matrix as the single-round payoff matrix, consider the infinitely repeated game with average payoffs.

2.1 In the *single-round game*, there is a mixed strategy Nash equilibrium where players I and II, respectively, play the mixed strategies (3/5, 2/5) and (2/5, 3/5).

☐ True ☐ False

2.2 In the *infinitely repeated game*, there is a mixed strategy Nash equilibrium that is formed by the single-round mixed strategy profile (now played in every round) where players I and II, respectively, play the mixed strategies (3/5, 2/5) and (2/5, 3/5).

☐ True ☐ False

2.3 There is a strategy profile for the repeated game that has average payoff profile (1, 1) and is a Nash equilibrium.

☐ True ☐ False

2.4 There is a strategy profile for the repeated game that has average payoff profile (2, 2) and is a Nash equilibrium.

☐ True ☐ False

2.5 There is a strategy profile for the repeated game that has average payoff profile (1.5, 3) and is a Nash equilibrium.

☐ True ☐ False

3

This question concerns the 3-round iterated Prisoner's dilemma with single-round payoff matrix as follows:

$$\begin{bmatrix} 3 & 0 \\ 5 & 1 \end{bmatrix}$$

For this problem we define a set of four strategies, $S = \{s_0, s_1, s_2, s_3\}$. The strategy s_k is to conditionally cooperate for k rounds, i.e., to cooperate the first k rounds unless the opponent has defected in any earlier round.

Assume that both players choose their strategies from the set S or as a mixed strategy based on strategies from the set S.

Then, the payoff profiles of the pure strategy profiles are as follows:

		Player 2			
		s_0	s_1	s_2	s_3
Player 1	s_0	$(3,3)$	$(7,2)$	$(7,2)$	$(7,2)$
	s_1	$(2,7)$	$(5,5)$	$(9,4)$	$(9,4)$
	s_2	$(2,7)$	$(4,9)$	$(7,7)$	$(11,6)$
	s_3	$(2,7)$	$(4,9)$	$(6,11)$	$(9,9)$

3.1 The strategy s_2 is strictly dominated.

☐ True ☐ False

3.2 The strategy s_3 is strictly dominated.

☐ True ☐ False

3.3 There is exactly one pure strategy Nash equilibrium and at least one mixed strategy Nash equilibrium.

☐ True ☐ False

3.4 The strategy profile where both players always play s_0 is a subgame perfect equilibrium.

☐ True ☐ False

3.5 The strategy profile where both players always play s_1 is a subgame perfect equilibrium.

☐ True ☐ False