

Multiple-choice questions. Choose the best answer.

- 1) A Prisoners' Dilemma is a game with all the following characteristics except one. Which one is not present in a Prisoners' Dilemma?
 - A) ***Only one player has a strictly dominant strategy while the other player does not have a strictly dominant strategy.***
 - B) The Nash equilibrium strategy for each player is to defect (or cheat).
 - C) Both players would be better off if neither choose their strictly dominant strategy.
 - D) There is a unique pure-strategy Nash equilibrium.

- 2) Which of the following is not a zero-sum game?
 - A) Matching Pennies
 - B) Competition among two firms when market share is the payoff
 - C) ***Prisoners' Dilemma***
 - D) All of the other three alternatives

- 3) How many Nash equilibria are there in a Battle-of-the-Sexes game?
 - A) 1
 - B) 2
 - C) ***3***
 - D) None of the other three alternatives

Consider the following game of Stag-Hunt to answer questions 4 and 5.

	Stag	Hare
Stag	200,200	0,100
Hare	100,0	100,100

- 4) What is the strictly dominant strategy of the column player?
 - A) Stag
 - B) Hare
 - C) Both Stag and Hare are strictly dominant strategies
 - D) ***None of the other three alternatives***

- 5) What is the risk-dominant Nash equilibrium in this game?
 - A) ***(Hare, Hare)***
 - B) (Stag, Stag)
 - C) Both (Hare, Hare) and (Stag, Stag) are risk-dominant.
 - D) None of the other three alternatives

- 6) Firm A and firm B work closely together and must decide whether to buy Windows or Mac computers. If they both buy Windows computers, they coordinate well together, and firm A earns 300 while firm B earns 400. On the other hand, if they both buy Mac computers, firm A gets 400 and firm B gets 300. If they buy different platforms (that is, one firm buys Windows and the other buys Mac), they have trouble coordinating,

and get a payoff of 100 each. There are two pure-strategy Nash equilibria in this game. There is also one mixed strategy Nash equilibrium. If the probability that firm A chooses Windows is denoted by p and the probability that firm B chooses Windows is denoted by q , in the mixed strategy Nash equilibrium, the values of p and q are given by:

- A) $p = 0.5, q = 0.5$
- B) $p = 0.4, q = 0.6$**
- C) $p = 0.4, q = 0.5$
- D) $p = 0.4, q = 0.4$

Consider the following game to answer questions 7 and 8.

	Left	Middle	Right
Up	2,9	6,5	7,4
Straight	5,6	8,2	3,8
Down	9,1	4,7	7,3

- 7) What is the security strategy of the row player?
 - A) Up
 - B) Straight
 - C) *Down***
 - D) All of the other three alternatives
- 8) What is the security strategy of the column player?
 - A) Left
 - B) Middle
 - C) *Right***
 - D) All of the other three alternatives

Consider the following game to answer questions 9 and 10.

	L	R
U	240, 0	0, 120
M	200, 40	80, 40
D	180, 60	120, 0

- 9) What are the rationalizable strategies for the row player?
 - A) {U, M}
 - B) *{U, M, D}***
 - C) {M, D}
 - D) {U, D}
- 10) How many pure-strategy Nash equilibria are there in this game?
 - A) *0***
 - B) 1

- C) 2
D) 3

Consider the following game to answer questions 11-15.

	W	X	Y	Z
A	0,1	0,3	0,1	3,0
B	0,2	3,0	1,1	2,4
C	3,2	2,4	10,1	1,2
D	5,3	0,5	0,10	1,2

- 11) Which of the following mixed strategies between the actions X and Z strictly dominates W for the column player?
- A) 0.2 probability on X and 0.8 probability on Z
B) 0.8 probability on X and 0.2 probability on Z
C) 0.4 probability on X and 0.6 probability on Z
D) None of the other three alternatives
- 12) Which of the following mixed strategies between the actions W and Z strictly dominates X for the column player?
- A) 0.2 probability on W and 0.8 probability on Z
B) 0.8 probability on W and 0.2 probability on Z
C) 0.4 probability on W and 0.6 probability on Z
D) None of the other three alternatives
- 13) What are the rationalizable strategies for the row player?
- A) {A, C, D}
B) {A, B}
C) {C}
D) None of the other three alternatives
- 14) What are the rationalizable strategies for the column player?
- A) {W, Y, Z}
B) {X, Y}
C) {Y, Z}
D) None of the other three alternatives
- 15) What is the mixed strategy Nash equilibrium of the game?
- A) $((\frac{4}{7}, \frac{3}{7}, 0, 0), (0, \frac{1}{4}, 0, \frac{3}{4}))$
B) $((\frac{3}{4}, 0, 0, \frac{1}{4}), (0, \frac{1}{4}, 0, \frac{3}{4}))$
C) $((0, 0, \frac{2}{3}, \frac{1}{3}), (\frac{1}{4}, 0, 0, \frac{3}{4}))$
D) $((\frac{1}{3}, 0, 0, \frac{2}{3}), (\frac{2}{7}, \frac{5}{7}, 0, 0))$

Consider the following pricing game to answer questions 16-18. There are two firms A and B. Firm A has a constant per-unit/marginal cost of 43 dollars, whereas firm B has a constant marginal cost of 46 dollars. There are 500 total customers in the market and they will buy from the firm which charges a lower price. If both firms charge the same price, then they split the

total demand with each getting 250 customers. Assume that each firm maximizes its profit by choosing a price to set in the market. That is, the two firms are involved in a simultaneous-price setting game, with firm A choosing P_A and firm B choosing P_B . Furthermore, each firm is restricted to choose a price that is an integral number of dollars, that is, 0, 1, 2, 3,, 43, 44, 45, 46, 47,

- 16) Which one of the following is a pure-strategy Nash equilibrium of the game?
- A) $P_A = 43, P_B = 43$
 B) $P_A = 44, P_B = 44$
 C) Both $P_A = 43, P_B = 43$ and $P_A = 44, P_B = 44$ are Nash equilibria
D) None of the other three alternatives
- 17) Which one of the following is a pure-strategy Nash equilibrium of the game?
- A) $P_A = 46, P_B = 46$
 B) $P_A = 47, P_B = 47$
 C) $P_A = 48, P_B = 48$
D) None of the other three alternatives
- 18) Which one of the following is a pure-strategy Nash equilibrium of the game?
- A) $P_A = 46, P_B = 45$
B) $P_A = 45, P_B = 46$
 C) $P_A = 45, P_B = 45$
 D) None of the other three alternatives

Consider the following game to answer questions 19-20.

	L	R
U	200, 0	0, 0
M	50, 20	-10, 20
D	100, -100	100, 200

- 19) The row player will choose M as his best response strategy if
- A) the row believes that the column will play L for sure.
 B) the row believes that the column will play L with 2/3 probability and R with 1/3 probability.
 C) the row believes that the column will play L with 1/2 probability and R with 1/2 probability.
D) None of the other three alternatives
- 20) How many Nash equilibria are there in this game?
- A) **Infinitely many**
 B) 3
 C) 5
 D) None of the other three alternatives

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