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reviewer2@nptel.iitm.ac.in ▼

Courses » Strategy: An Introduction to Game Theory

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## Unit 6 - Week 5

### Course outline

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- Bayesian Games
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- Yield vs Fight
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- Bayesian Games with mixed strategies
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### Assignment- 5

The due date for submitting this assignment has passed. **Due on 2017-02-28, 23:55 IST**  
As per our records you have not submitted this assignment.

Consider a modified version of the Bayesian Battle of Sexes, with the Boy i.e. Player 1 or the row player of a single type and the Girl i.e. Player 2 or the column player of two types Interested ( $I$ ), Uninterested ( $U$ ) with  $P(I) = 2/3$  and  $P(U) = 1/3$ . The game tables for both types of the Girl player are shown below. Answer the questions that follow based on this game

1.1) What is the payoff to the boy for choosing the pure strategy  $C$ , when the girl is choosing  $(C, H)$  i.e. girl of type  $I$  is choosing  $C$  and girl of type  $U$  is choosing  $H$  **1 point**

- 5/2
- 3
- 7/2
- 4

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
4

2) What is the payoff to the boy for choosing the pure strategy  $H$ , when the girl is choosing  $(H, C)$  i.e. the girl of type  $I$  is choosing  $H$  and girl of type  $U$  is choosing  $C$ . **1 point**

- 5/2
- 3
- 7/2
- 4

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
3

1.3) Which of the following are the best responses of the boy to the strategies  $(C, H)$  and  $(H, H)$  of the girl respectively **1 point**

- C, C

- C, H
- H, C
- H, H

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

C, C

14) Which of the following is a Bayesian Nash equilibrium for the above game

1 point 

- (C,(C,C))
- (H,(C,C))
- (C,(H,H))
- None of the above



**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

None of the above

5) Which of the following is a Bayesian Nash equilibrium of the above game

1 point

- (C,(C,H))
- (H,(H,C))
- Both of the above
- None of the above

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

Both of the above

There are two firms deciding whether or not to enter a market. If they both enter, they become duopolists and make low (or negative) profits, while if only a single firm enters, it becomes a profitable monopolist. If both firms fail to enter, they get payoffs of zero. However, their costs of enter can be private information. The payoffs for the game are given by the strategy form below, where E is "Enter", D is "Don't Enter",  $e_r = 1.5$  is the entry cost of the row player i.e. Firm 1, and  $e_c$  is the privately known entry cost of the column player i.e. Firm 2. It is a low value  $e_c = 3/4$  with probability  $P(L) = 2/3$  and a high value  $e_c = 3/2$  with probability  $P(H) = 1/3$

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6) What are the payoffs to Firm 1 for choosing the pure strategies E, D respectively when Firm 2 is choosing (E, D) i.e. Firm 2 of type L is choosing E and Firm 2 of type H is choosing D

- $-\frac{2}{3}, -\frac{1}{2}$
- $-\frac{1}{2}, 0$
- $-\frac{1}{6}, 0$
- $0, \frac{1}{6}$

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

$$-\frac{1}{6}, 0$$

1.7) Which of the following are the best responses of Firm 1 to the strategies  $(E,E)$ ,  $1\text{ point}$   
 $(D,D)$  respectively of Firm 2

- E,E
- E,D
- D,E
- D,D

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*D,E*

1.8) Is there any strategy of Firm 2 of any type which is a strictly dominated strategy  $1\text{ point}$   
 and therefore cannot be part of the Nash equilibrium? Remember, action  $a_i$  of player  
 strictly dominated by another action  $b_i$ , if  $b_i$  yields a strictly higher payoff in comparison  
 to  $a_i$ , for every possible action  $a_{-i}$  of the other player.

- E of Firm 2 of type H
- D of Firm 2 of type H
- D of Firm 2 of type L
- None of the above

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*D of Firm 2 of type L*

1.9) Which of the following is a Bayesian Nash equilibrium of the above game  $1\text{ point}$

- ( E, (D, E))
- ( D, (E, D))
- ( E, (D, D))
- None of the above

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*None of the above*

1.10) Which of the following is a Bayesian Nash equilibrium of the above game  $1\text{ point}$

- (D,(E,E))
- (D,(D,E))
- (E,(E,D))
- None of the above

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(D,(E,E))*

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