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Courses » Strategy: An Introduction to Game Theory

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## Unit 7 - Week 6

### Course outline

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- Auctions
- Sealed Bid First Price Auction
- Expected Revenue
- Bayesian Second Price Auction
- Expected Revenue: Second Price Auction
- All Pay Auction
- Quiz : Assignment -6

Week 7

Week 8

## Assignment -6

The due date for submitting this assignment has passed. **Due on 2017-03-09, 23:59 IST**  
As per our records you have not submitted this assignment.

Consider the Bayesian FIRST price sealed bid auction with 2 bidders, denoted by Player 1 and Player 2. Let their private valuations  $v_1, v_2$  respectively be independent and uniformly distributed in  $[0,1]$ . Answer the questions that follow

1) What is expected value of the sum of the cubes of the valuations of the players **1 point**

- $2/3$
- $1$
- $1/2$
- $3/4$

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

$1/2$

2) If player 2 is bidding  $v_2$ , what is the best response bid  $b_1$  of player 1 **1 point**

- $b_1 = (2/3) v_1$
- 
- $b_1 = 0$
- $b_1 = (1/2) v_1$

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

$b_1 = (1/2) v_1$

3) What are the Bayesian Nash equilibrium bids  $b_1, b_2$  of Players 1, 2 respectively **1 point** for the above auction

- $b_1 = v_1, b_2 = v_2$
- $b_1 = (1/3) v_1, b_2 = (1/3) v_2$
- $b_1 = (1/2) v_1, b_2 = (1/2) v_2$
- $b_1 = 0, b_2 = 0$

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

$$b_1 = (1/2) v_1, b_2 = (1/2) v_2$$

4) What is the revenue to the auctioneer in the Bayesian sealed bid first price auction described above **1 point**

- 
- $0.5 \times \max\{v_1, v_2\}$
- 
- $0.5 \times \min\{v_1, v_2\}$
- $\min\{v_1, v_2\}$
- $\max\{v_1, v_2\}$

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

$$0.5 \times \max\{v_1, v_2\}$$

5) What is the expected value of the revenue of the auctioneer in the auction described above **1 point**

- $1/3$
- $1$
- $1/2$
- $1/4$

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

$$1/3$$

Consider the Bayesian SECOND price sealed bid auction with 2 bidders, denoted by Player 1 and Player 2. Let their private valuations  $v_1, v_2$  respectively be independent and uniformly distributed in  $[0,1]$ . Answer the questions that follow

6) If player 2 is bidding  $\frac{1}{2}v_2$  and  $v_1 > v_2$ , what is the complete set of best response bids  $b_1$  of player 1? **1 point**

- 
- $b_1 = \frac{1}{2}v_1$
- 
- $b_1 = v_1$
- 
- any bid  $b_1 > v_2$
- 
- any bid  $b_1 \geq \frac{1}{2}v_2$

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

$$\text{any bid } b_1 \geq \frac{1}{2}v_2$$

7) What are the Bayesian Nash equilibrium bids  $b_1, b_2$  of Players 1,2 respectively for the above auction **1 point**

- 
- $b_1 = \frac{1}{2}v_1, b_2 = \frac{1}{2}v_2$
- 
- $b_1 = \frac{1}{3}v_1, b_2 = \frac{1}{3}v_2,$





$$b_1 = v_1, b_2 = v_2,$$



$$b_1 = 0, b_2 = 0$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$b_1 = v_1, b_2 = v_2,$$

8) What is the expected value of the revenue of the auctioneer in the auction described above

1 point



1



1/3



1/2



1/4

No, the answer is incorrect.

Score: 0

Accepted Answers:

1/3

9) The principle governing revenues in Bayesian auctions is termed as

1 point



Revenue sharing principle



Gross revenue principle



Revenue maximization principle



Revenue equivalence principle

No, the answer is incorrect.

Score: 0

Accepted Answers:

Revenue equivalence principle

Consider the Bayesian ALL-PAY auction with 2 bidders, denoted by Player 1 and Player 2. Let their private valuations  $v_1, v_2$  respectively be independent and uniformly distributed in  $[0,1]$ . Answer the questions that follow

10) Consider bid  $b_2 = \frac{1}{4}v_2$  of player 2. What is the best response bid  $b$  of player 1? 1 point



$$b = \frac{1}{4} \text{ if } v_1 > \frac{1}{4}, b = 0 \text{ if } v_1 < \frac{1}{4}, \text{ any } 0 \leq b \leq \frac{1}{4} \text{ if } v_1 = \frac{1}{4}$$



$$v_1^2$$



$$b = 0 \text{ if } v_1 > \frac{1}{2}, b = 1 \text{ if } v_1 < \frac{1}{2}, \text{ any } 0 \leq b \leq 1 \text{ if } v_1 = \frac{1}{2}$$



$$\frac{1}{2}\sqrt{v_1}$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$b = \frac{1}{4} \text{ if } v_1 > \frac{1}{4}, b = 0 \text{ if } v_1 < \frac{1}{4}, \text{ any } 0 \leq b \leq \frac{1}{4} \text{ if } v_1 = \frac{1}{4}$$



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