Feedback — Quiz 8: Sections 17-18

You submitted this quiz on **Sat 17 Nov 2012 7:40 PM PST**. You got a score of **10.00** out of **10.00**.

Section 17 covers the Prisoners' Dilemma game and Collective Action. You should be prepared to recognize examples of the Prisoners' Dilemma game, to remember our 7 ways to cooperation, and to distinguish between collective action problems and common pool resource problems.

Section 18 concerns Mechanism Design. Be ready to recognize aspects of different types of auctions, and to use the "pivot mechanism" to determine the viability of public projects.

There is a small amount of math on this quiz, but it's mostly conceptual.

Good luck!

Question 1

Which of the following are Prisoners' Dilemma games? More than one correct answer is possible.

Your Answer		Score	Explanation
☑ Two neighboring countries decide whether to build up armies.	✔	0.33	
☑ Two politicians decide whether to use negative advertisements against one another.	✔	0.33	
☐ Two people decide whether to shake or bow.	✔	0.33	
Total		1.00 / 1.00	

Question Explanation

The incorrect option - two people deciding whether to shake or bow - is an example of a coordination game. The rules for coordination games are less stringent than those of a prisoners' dilemma game.

The other two options are correct. In both cases - governments deciding to build armies and politicians deciding to run negative ads - both parties will do well if they cooperate, but each party has an individual incentive to defect if the other cooperates. The common result is that both parties have incentives to defect, and both must accept lower payoffs than if they had cooperated.

[See 17.2, "The Prisoners' Dilemma Game"]

Question 2

Which method for sustaining cooperation (of the seven we discussed) best explains why business partners cooperate with one another?

Your Answer		Score	Explanation
Group Selection	✓	1.00	
Total		1.00 / 1.00	

Question Explanation

Partners who don't cooperate with one another probably get driven out of business, so group selection is the best argument.

In other words, teams that cooperate with one another will outperform teams that fight against one another.

[See 17.3, Seven Ways to Cooperation"]

Question 3

Each of six people must decide whether or not to let their cows graze in a meadow.

The payoff to a person who doesn't let her cow graze equals 0.

The payoff to a person who does let her cow graze equals $4-N$, where N is the number who let their cows graze.

We want the highest possible sum of payoffs to these six people. To achieve this, exactly how many people should be allowed to let their cows graze?

You entered:

2

Your Answer		Score	Explanation
2	✓	1.00	
Total		1.00 / 1.00	

Question Explanation

If N=1, five people get a payoff of 0, and one gets a payoff of 3, for a total of 3.

If N=2, four people get a payoff of 0, and two get a payoff of 2, for a total of 4.

If N=3, three people get a payoff of 0, and three get a payoff of 1, for a total of 3.

So the answer is N=2. To ensure the greatest sum of payoffs, two people should be allowed to let their cows graze.

You can also solve using calculus, and maximizing N(4-N).

[See 17.4, "Collective Action and Common Pool Resource Problems"]

Question 4

Which of the following might be a common pool resource problem? More than one answer is possible.

Your Answer		Score	Explanation
☑ Turkey hunting	✓	0.33	
☐ Shoveling snow off sidewalks	✓	0.33	
☑ Lobster fishing	✓	0.33	
Total		1.00 / 1.00	

Question Explanation

Common pool resource problems must involve a resource that we all draw from -- like lobster or turkeys -- and if we over-harvest, the population cannot regenerate.

Shoveling snow, on the other hand, is a collective action problem. We all may benefit from our neighbors shoveling their walks, but we can't think of snow as a shared resource that is unable to regenerate.

[See 17.4, "Collective Action and Common Pool Resource Problems"]

Question 5

A city manager offers ten free tulips to any resident who agrees to plant them.

The cost of planting is one unit of happiness.

The benefit of planting is 1.5N, where N is the number of people who plant.

Given these numbers, what should the city manager do to make sure that people take her up on her offer?

Your Answer		Score	Explanation
Do nothing; it's not a collective action problem.	✓	1.00	
Total		1.00 / 1.00	

Question Explanation

In this case, the benefit to each individual is higher than the cost to each individual.

This is not a collective action problem. The city manager need do nothing.

[See 17.5, "No Panacea"]

Question 6

A student can either get a good score or a bad score on an exam. The probability of getting a good score on the exam is 0.8 if you study (put in effort e=1) and 0.30 if you don't study (put in effort e=0). The cost of studying = 20.

A school wants to offer a scholarship of value M that will encourage students to study. Students will receive the scholarship if they get a high score on the exam. Students will get nothing if they receive a low score on the exam.

Which of the following values of M will ensure that students study? There may be more than one correct answer.

Your Answer		Score	Explanation
☐ 1	✓	0.20	
☐ 25	✓	0.20	
☐ 30	✓	0.20	
☑ 100	✓	0.20	
☑ 41	✓	0.20	
Total		1.00 / 1.00	

Question Explanation

.8M+.2(0)-20>.3M+.7(0)

Simplify:

.8M-20>.3M

Simplify again:

.5M>20.

One more time:

M>40.

The scholarship must have a value of at least 40 in order to ensure that students study, given the cost of studying.

Therefore, M=41 and M=100 are both correct.

[See 18.2, "Hidden Action and Hidden Information"]

Question 7

If Maria is bidding in a Sealed Bid auction and she knows all of her opponents will bid their value, what should Maria bid?

Assume bids are uniformly distributed in the interval [0,1], as we did in lecture.

Your Answer		Score	Explanation
She should bid half her value (B=\frac{V}{2})	✓	1.00	
Total		1.00 / 1.00	

Question Explanation

This is straight from the lecture.

V-B = Maria's surplus.

B=p(winning), so her expected winnings = surplus * probability = B(V-B).

In order to maximize this function, we take the derivative and set that equal to zero:

V-2B=0.

So B=\frac{V}{2}.

Maria should bid half her value.

[See 18.3, "Auctions"]

Question 8

True or False:

If all bidders are rational, then the bidder with the highest value will win, regardless of the type of auction (Ascending Price, Second Price, or Sealed Bid).

Your Answer		Score	Explanation
True	✓	1.00	
Total		1.00 / 1.00	

Question Explanation

As discussed, rational bidders should not bid more than their true value.

In an Ascending Price auction, you bid until the price is above your value. Therefore, the winner - who is still in after everyone else has stopped bidding - must have the highest value.

In a Second Price auction, you bid your true value (weakly dominant strategy). Therefore the highest bidder will be the person with the highest value, since B=V.

In a Sealed Bid auction, you will never pay over your value. We showed that you would bid half your value. If everyone bids half their value, you still bid half your value (see lecture), so B=V/2. Whoever has the highest value wins again.

[See 18.3, "Auctions"]

Question 9

Which of the following makes the statement true? You may select more than one answer.

In a Second Price auction...

Your Answer		Score	Explanation
☐ the revenue will always be less than the revenue of an ascending bid auction.	✓	0.20	
☐ the winner pays whatever they bid.	✓	0.20	
☐ you should bid half your value.	✓	0.20	
☑ you should bid your true value (assuming all players are rational).	✓	0.20	
☑ the winner pays the second highest price.	✓	0.20	
Total		1.00 / 1.00	

Question Explanation

In a Second Price auction 'the winner pays the second highest price' and 'you should bid your true value (assuming all players are rational)'.

You bid half your value in the Sealed Bid auction (not in Second Price).

By definition, in Second Price, the winner pays the second highest bid, not what they bid.

And by the revenue equivalence theorem, if certain conditions are met, the Second Price auction can have equal revenue to the Ascending and Sealed Bid auctions.

[See 18.3, "Auctions"]

Question 10

A Pivot Mechanism is used to allocate a public project. The cost of the project is 80.

April values the project at 40. Baruk values it at 30 and Cortez values it at 20.

If these are the only three people who have positive value for the project, how much will April have to pay?

You entered:

0

Your Answer		Score	Explanation
0	✓	1.00	
Total		1.00 / 1.00	

Question Explanation

In the Pivot Mechanism, everyone pays the cost of the project minus the sum of the others' values. However, if this process does not yield enough money to pay for the project, everyone pays $0.

So April would pay 80-(20+30)=30;

Baruk would pay 80-(40+20)=20;

And Cortez would pay 80-(40+30)=10.

So they would pay 30+20+10=60

Since $60 isn't enough to buy the $80 project, they'd all pay $0.

[See 18.4, "Public Projects"]