902. Issues in Economic Systems and Institutions
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Practice Problems.

ESSAY TYPE QUESTIONS

1. "If decision makers must rely on interested experts (whose objectives differ from the decision maker's) for critical information relevant to the decision, incentive problems will guarantee that only coarse information will be conveyed." Evaluate this statement critically.

2. Explain how the theory of cheap talk provides broad support for the idea of decentralization in organizations, as well as rules that promote transparency (e.g. mandatory disclosure of accounts, technical evaluations, consumer feedback, etc.)

3. Consider a typical buyer-seller problem where the quality of the good is private information to the seller. Competition among buyers make sure that the price paid is an increasing function of perceived quality. Discuss how outcomes may differ depending on whether the seller can convey quality information through (a) cheap talk (claims are unverifiable) (b) hard evidence (claims are voluntary but verifiable) (c) commitments (e.g. commitment to disclose all information before they become available).

4. Explain how Condorcet's jury theorems provide a *pragmatic* rationale for democratic decision making. Discuss some conditions under which one or more of the conclusions of the jury theorems may not hold.

5. Increasing the number of votes needed to get a conviction in a jury trial may *increase* the chance of convicting innocent defendants. Explain how this paradoxical outcome may arise as a result of strategic interaction among jurors.

6. Examine the idea of "wisdom of crowds", i.e. the notion that large masses of people make accurate decisions on average. Discuss situations you have studied where this sort of conclusion may be justified, and others where it may fail in a spectacular way.

7. Discuss how racial or gender discrimination can arise in hiring even if different races or sexes have the same statistical distribution of capabilities, and employers do not have a taste for discrimination. What is the role for government inervention in such scenarios?

PROBLEM SOLVING QUESTIONS

8. Consider the uniform-quadratic version of the Crawford Sobel model of cheap talk.

   (a) Find all equilibria when the sender's bias $b = \frac{1}{20}$.
   (b) What is the lowest value of b (in the sense of infimum) that will permit the existence of an equilibrium with four intervals?
   (c) Characterize partition equilibria when the sender's payoff takes the following form:

$$U_S = -(a - b - c\theta)^2$$

   where $b, c > 0$.

9. Consider a cheap talk game with one sender and two receivers, R_1 and R_2. The state-of-the-world is θ, receivers will take actions a_1 and a_2 respectively, and preferences are given by

$$
\begin{aligned}
U_{R_i} &= -|a_i - \theta| \\
U_S &= -|a_1 - b_1 - \theta| - |a_2 - b_2 - \theta|
\end{aligned}
$$

where b_i is the sender's bias vis-a-vis receiver i's action. Consider two variants: (i) the private message game, where the sender sends separate private messages to the two receivers (ii) the public message game, where the sender sends a single message which is heard by both receivers. Analyze the equilibria of the two games, and compare their most informative equilibria. When does public speech induce more honesty than private speech?

10. Consider the Chinese Whispers game, which goes as follows. There are two senders, 1 and 2, and one receiver. Only sender 1 knows the state θ. Sender 1 can only send a message to sender 2, who in turn can send a message to the receiver, who in turn chooses the action. Sender 1 has zero bias, but sender 2 has some positive bias $b > 0$.

   (a) Analyze partition equilibria of this game, assuming the usual uniform distribution and quadratic preferences. Is there any equilibrium where sender 1's message strategy is fully revealing?

   (b) How does the most informative equilibrium of this game compare with the one where sender 2 is fully informed about θ?

11. Take the Feddersen-Pesendorfer model of strategic voting with n voters (odd number), prior of $\frac{1}{2}$, symmetric, binary signals with accuracy p, and threshold of doubt q.

   (a) If $q = \frac{1}{2}$, what is the optimum voting rule?

   (b) Suppose $n = 3$, $q = \frac{1}{2}$ and $p = \frac{2}{3}$. Unanimity is needed for conviction. Find the symmetric equilibrium in mixed strategies and calculate the probability of convicting the innocent.

   (c) Suppose $n = 5$ and $p = \frac{2}{3}$. What is the lowest value of q for which unanimity requirement for conviction is the optimum voting rule?

   (d) Suppose $p = \frac{2}{3}$ and $q = 0.9$. What is the highest value of n for which unanimity requirement for conviction is the optimum voting rule?

12. Change the payoffs slightly in the Bikhchandani-Hirschleifer-Welch model of information cascades. The asset yields a net return of $+1$ in the good state and -2 in the bad state. The prior on the state being good is $\frac{1}{2}$ and the accuracy of the signal is $p = \frac{3}{5}$. After what kind of histories will an information cascade start? Calculate the probability of right and wrong cascades assuming an infinite sequence of investors.

13. The following simple model is meant to illustrate the idea that statistical discrimination could lead to division of labour between men and women (men work mostly for paid work through the market, women work mostly for unpaid housework) even though the two populations are fundamentally similar..

   An economy has several households, each consisting of a man and a woman. A worker of either sex produces output of value 1 every period, but only after the employer incurs an initial lump sum training cost of c. There is Bertrand competition among firms when they compete to hire new workers. Once a worker is hired by a firm at some wage, s/he cannot be rehired by another firm or the wage cannot be renegotiated. However, the worker can leave the job at any time.

   Each family may receive a shock (e.g. childbirth) which makes it necessary for one of its members to withdraw from paid employment and work in the household. A man receives 0 utility from working in the household, while a woman receives an utility v (in monetary erms) which is a random draw from a distribution $f(v)$ with zero mean. Thus, women on average, find household work no more pleasant (or unpleasant) than men. A household with two working members may receive the shock in any given period with probability q, and must then decide who should quit his/her job. Every household cooperatively maximizes the sum of members' labour market earnings and utility from household work.

   Demonstrate the possibility of multiple equilibria in this model, including one where men disproportionately work for pay, and women disproportionately work at home.