1. There may be questions similar to those on PS 4 or 5 (even though not graded).
2. There may be questions similar to those on the review for the first Midterm.
3. There may be questions similar to those on the review for the second midterm.

4. The Newhouse model of nonprofit hospitals has hospitals caring about both quality \( q \) and quantity \( N \) of care provided, and hence \( U(q, N) \).
   i. Ignore all of the complexity of diverse types of treatment and patient severity of illness, and assume that there is only one price \( P \) for a hospital stay, set by the government, and paid uniformly to all hospitals.
   ii. Assume that there are only two hospitals in a given market area, and that both hospitals have identical cost functions. Let \( q^A \) and \( q^B \), the only choice variables for the two hospitals, be the quality choices of hospitals A and B.
   iii. Assume that patients are fully insured, and that patients demand at hospital A, \( N(q^A, q^B) \) responds positively to quality \( q \) offered by that hospital, but not the price.
   iv. Hospital A's cost function \( C(q^A, N(q^A, q^B)) \) can be used to identify the zero profit locus of combinations of \( q \) and \( N \), where \( P = C(q^A, N^A) \), and \( q^A = q^B \). Suppose it is captured by the following curve.

Using the above figure, what combination of quality and quantity would the two nonprofit hospitals collude to provide if they both wanted to
   a. Maximize patient quality?
   b. Maximize number of patients treated?
c. Maximize a weighted average of q and N where both are goods?
d. Optimize quality where quality is a good but treating more patients is viewed as a bad.
(sometimes viewed as the objective of professors…)
e. Maximize profits?

f) Suppose hospital B decides to switch to being a for-profit firm. If hospital A initially holds
quality fixed at q\textsuperscript{A}, what will hospital B do to its quality q\textsuperscript{B}?

5. a) Imagine that there are only two countries in the world, Canada and the US, and that the
demand for drug XYZ prescriptions in each country are as follows

\[ Q^{\text{US}} = 10,000,000 - 1000 P \]
\[ Q^{\text{CAN}} = 1,000,000 - 1000 P \]

Assume that the marginal cost is constant at $100 per prescription.

b) Suppose that you are a profit maximizing drug manufacturer able to choose prices separately
in the US and Canada. What prices \( P^{\text{US}} \) and \( P^{\text{CAN}} \) do you choose in each country if there is no
resale between countries? What profits are earned in each of the two countries?

c) Suppose now that you are told that you must charge the same price in both countries. How
does this change your optimal pricing strategy?

d) Should Canada favor a single price policy? Why or why not?

a) What is the importance of separately modeling factors affecting the probability of being sick
and the probability of seeking treatment when sick?
b) What variables do they use as instruments, which they claim affect the probability of being
sick but not the probability of seeking treatment?
c) Why is modeling the impact of bus/taxi costs on choice of providers useful?

An extract of Ellis and Mwabu Table 4 in that report is shown below. IN each case the first
number is the coefficient from a logit discrete choice model and the second number in
parentheses is the t ratio.
**Table 4 Parameters of Nested Logit Model of Travel Mode Decision**

<table>
<thead>
<tr>
<th>Choice of Travel Mode</th>
<th>( \beta_4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>WALK_TIME</td>
<td>-0.018</td>
</tr>
<tr>
<td></td>
<td>(-4.248)</td>
</tr>
<tr>
<td>BUS_TIME</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(-0.485)</td>
</tr>
<tr>
<td>TRAVEL_COST</td>
<td>-0.008</td>
</tr>
<tr>
<td></td>
<td>(-1.173)</td>
</tr>
</tbody>
</table>

d) Here walk time is measured in minutes, and travel cost is measured in Kenya Shillings. Assume that the travel cost is round trip, and the walk time measures the one way travel time. These beta parameters can be interpreted as utility function weights. Using this information, what increase in travel cost causes the same loss of utility as a one hour increase in two-way walk time?

7. Consider the following figure from the 2002 NEJM on treating osteoarthropathy of the knee.

![Figure 1](image_url)

**Figure 1.** Mean Values (and 95 Percent Confidence Intervals) on the Knee-Specific Pain Scale. Assessments were made before the procedure and 2 weeks, 6 weeks, 3 months, 6 months, 12 months, 18 months, and 24 months after the procedure. Higher scores indicate more severe pain.

a) Which alternative appears to have the greatest reduction in knee pain during the first 12 months following treatment?
b) What explanations can you offer for why the pain measure declined immediately following all three forms of treatment? What do the 95 percent confidence intervals tell us?

8. Ellis and Zhu (2015) examine how various health plans affect total spending differently.

a) What is the difference between Exclusive provider organizations and consumer driven health plans?
b) They model overall spending as the product of four terms. What are their four terms?
c) What does their work suggest about which of these terms is most affected by plan types?
d) Present one criticism of their work and suggest how they might improve on the paper.

9. Be able to draw the four agents and six primary contracting relations diagram for one country other than the US and explain how the choices in that country differ from the US. Explain how financial incentives and regulations are used to reduce or increase selection problems in that other country relative to the US.

10. There could be questions similar to either problem 1 or 3 on the first problem set.

11. There could be questions similar to any of the problems on the second problem set.

12. There could be a question similar to the monopsony problem on problem set 3.


14. An employer facing an upward-sloping labor supply decides to cancel its current offering of health insurance because it argues that it is too expensive. It argues that the insurance costs $5000 per year per employee, but its employees only value it at $3000 per employee per year. Use supply and demand curves to show what will happen to each of the following once insurance is cancelled: market demand, market supply, quantity of labor hired by this firm, average annual income paid per worker.

For the multiple choice or short answer section (30% of the total) know at least the following.

15. How does managed care differ from unmanaged care?

16. Be able to answer the following basic questions about HIV/AIDS (perhaps from reading the Wikipedia site. http://en.wikipedia.org/wiki/HIV) or viewing the slides from the Wenjia Zhu talk.

   - What does the abbreviation HIV stand for?
   - What body fluids can transfer the virus?
   - Untreated, what is the average survival time once infected?
   - In what year was HIV first clinically described?
   - In which country was HIV first recognized as a specific disease?
   - In what continent is HIV believed to have originated?
   - What continent has the highest incidence of HIV/AIDS?
   - Are the majority of the world’s cases of HIV cases in heterosexuals or homosexuals?

17. Which of the following is not an example of employers, plans or providers trying to attract a favorable selection of patients?
18. What definitions of predictability and predictiveness do Ellis and McGuire (2007) use in their development of their health plan selection index?

19. Which of the following is NOT one of the key differences between for-profit and not-for-profit organizations in the US?

20. Using the four-agent framework of Ellis and Fernandez, which of the following is NOT considered one of the four primary classes of agents in all health care markets.

21. Which of the following results is not implied by the Behavioral Economics exercise on anchoring done in class?

22. Which of the following is not a key result of Brill (2013) “The Bitter Pill” from Time Magazine.

This question or something similar will definitely be on the final exam.

a) Carefully describe one original hypothesis of the effects of F on a health or other outcome of possible interest. State clearly your hypothesis.

b) Describe the specification for the estimating equation(s) you would use to test this hypothesis.

c) Describe the analytic model (if any) that you would use to motivate it, or if not, discuss how it relates to at least one other paper or model.

d) Describe any data you would use to estimate your equation. Be sure to describe any controls you would use.

e) Describe a weakness of this approach that will be highlighted by the pro fluoride lobby, or by an econometrician, to you approach.

f) What justification can you give for why your estimation results, if they support F effects, will be indisputable evidence?