

Answer all questions in the space provided on the exam.

Total of 60 points (and worth 44.5% of final grade).

Read each question carefully, so that you answer the question.

**Multiple Choice (1 points each question)**

**CIRCLE ONE**

1. a b c d e

2. a b c d e

3. a b c d e

4. a b c d e

5. a b c d e

6. a b c d e

7. a b c d e

8. a b c d e

9. a b c d e

10. a b c d e

11. a b c d e

12. a b c d e

13. a b c d e

14. a b c d e

15. a b c d e

16. a b c d e

17. a b c d e

18. a b c d e

**Short Answer (6 points each question)**

1.(a) On an appropriate diagram show the welfare loss due to moral hazard of moving from health insurance that has an effective coinsurance rate of 50 percent to free health care.

(b) On an appropriate diagram show that a risk-averse consumer will prefer insurance (purchased at the actuarially fair price) to no insurance.

(c) Consider the following data from the Manning et al. paper.

TABLE 2—SAMPLE MEANS FOR ANNUAL USE OF MEDICAL SERVICES PER CAPITA

Plan	Face-to-Face Visits	Outpatient Expenses (1984 \$)	Admissions	Inpatient Dollars (1984 \$)	Prob. Any Medical (%)	Prob. Any Inpatient (%)	Total Expenses (1984 \$)	Adjusted Total Expenses (1984 \$) <sup>a</sup>
Free	4.55 (.168)	340 (10.9)	.128 (.0070)	409 (32.0)	86.8 (.817)	10.3 (.45)	749 (39)	750 (39)
25 Percent	3.33 (.190)	260 (14.70)	.105 (.0090)	373 (43.1)	78.8 (1.38)	8.4 (0.61)	634 (53)	617 (49)
50 Percent	3.03 (.221)	224 (16.8)	.092 (.0116)	450 (139)	77.2 (2.26)	7.2 (0.77)	674 (144)	573 (100)

Figures in parentheses are standard deviation of  $\bar{X}$ .

Are adjusted total expenses in the 50 percent plan statistically significantly different (at significance level 0.05) from those in the free plan?

[Note:  $T = [m_1 - m_2] / s$  where  $m_1$  and  $m_2$  are sample means and  $s$  equals the square root of  $(s_1^2 + s_2^2)$ . The critical value for a two-sided test is 1.96.]

**2.(a)(i)** What was the fundamental contribution to health policy research of the article by Neuhauser and Lewicki, “What Do We Gain from the Sixth Stool Guaiac?”?

**(ii)** What did this article conclude for the particular example it considered?

**(b)** Suppose that a person with terminal cancer has the following options:

- Do nothing: spend nothing and live two more years with each year worth 0.4 of a year in perfect health.
- Passive treatment: spend \$40,000, live four more years with each year worth 0.5 of a year in perfect health.
- Aggressive treatment: spend \$200,000, live ten more years with each year worth 0.6 of a year in perfect health.

With adjustment for quality of life, which treatment – passive or aggressive – is preferred on cost-benefit grounds? For simplicity there is no need to discount.

**(c) (i)** Explain the key features of managed care.

**(ii)** Explain the impact of managed care on the quality and cost of medical care in the U.S.

**3.(a)** On an appropriate diagram show the effect of physician-induced demand on the amount of health care provided and its price.

**(b)** A hospital is reimbursed under a prospective payment system with a casemix adjustment. Explain what this means and what incentive(s) it provides to the hospital.

**(c)** On an appropriate diagram show the optimal price and quantity sold of a patented drug that is produced by a drug company that acts as a monopolist in a single market.

4. Circle True or False to each of the following statements [One point each.]

- (a) **True** **False** In the U.S. children are less likely to have health insurance than the elderly.
- (b) **True** **False** Managed competition is an essential component of managed care.
- (c) **True** **False** The great rise in hospital expenditures since 1950 is due to a great rise in annual per capita patient bed days in hospital.
- (d) **True** **False** An important component of Medicare Part D is that it permits Medicare to negotiate with providers for lower pharmaceutical drug prices.
- (e) **True** **False** The Chou et al. study included time trends, in addition to including variables that changed over time such as restaurant food prices.
- (f) **True** **False** The infant mortality rate is the number of deaths in the first year per 1,000 live births.

5.(a) On an appropriate diagram show that in a market economy without government intervention too few people will be immunized against an infectious disease, even if people are fully informed about the potential risks of the infection and the costs of the immunization.

(b) For each of the following organizations provide the essential economic reason for their existence. A few words are sufficient.

(i) National Institutes of Health.

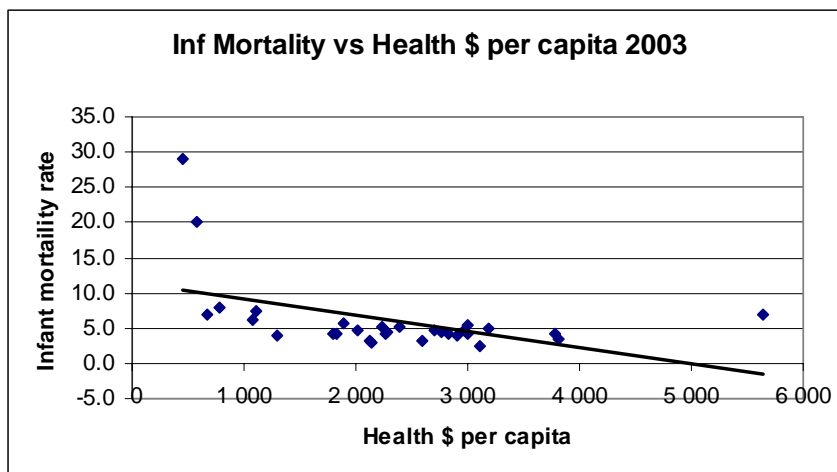
(ii) U.S. Public Health Service.

(c) Provide two fundamental differences between Medicare and Medicaid.

6.(a) The article by Cutler and McClellan “Is Technological Change in Medicine Worth It”, concluded that it was worth it. Provide some detail on their supporting evidence.

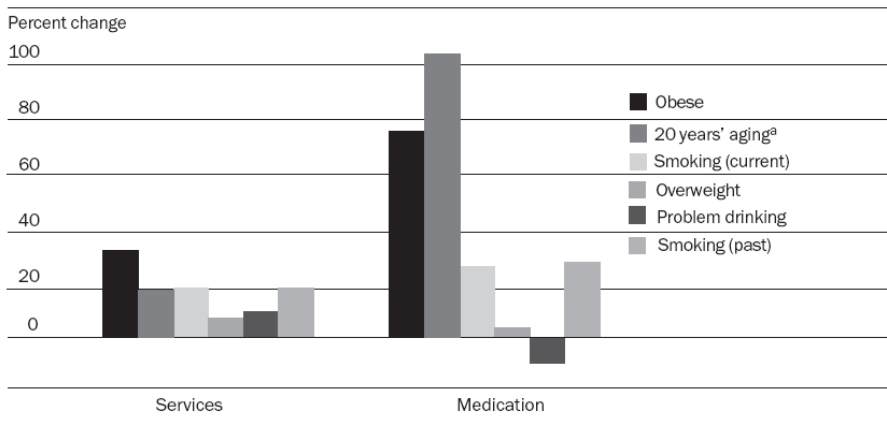
(b) Draw a rough plot of life expectancy as a function of per capita GDP, for per capita GDP ranging from \$1,000 to \$50,000.

(c) Consider the graph below, based on 30 OECD countries in 2003 including the U.S.



What lessons does this graph have regarding health outcomes in the United States?

7.(a) Consider the following from Roland Sturm, “The Effects Of Obesity, Smoking, And Drinking On Medical Problems And Costs”.



What was the key conclusion emphasized by Sturm from the graph above? Explain your answer.

(b) Consider the following table from Chou et al. “An Economic Analysis of Adult Obesity”.

Factor	Body mass index obese observed change = 2.13	Observed change <sup>a</sup> = 12.99
Race/ethnicity	0.08	0.36
Schooling	-0.06	-0.42
Marital status	-0.03	-0.13
Age	0.23	1.14
Household income	-0.08	-0.49
Restaurants	1.40	8.37
Fast-food restaurant price	0.09	0.47
Full-service restaurant price	0.05	0.33
Food at home price	0.14	0.95
Cigarette price	0.48	3.24
Alcohol price	0.01	0.09
Clean indoor air laws	0.09	0.54
Total predicted change	2.38	14.25

<sup>a</sup> In percentage points.

What was the key conclusion emphasized by Chou et al. from this table? Explain your answer.

(c) For the data used in the Chou et al. paper, the average BMI was 26, the average real fast-food restaurant price was \$2.90, and for the regression model for BMI the coefficient of fast-food price was -1.2 and the coefficient of fast-food price squared was 0.14.

Compute the implied elasticity of BMI with respect to real fast-food restaurant price.

**Multiple Choice (1 points each)      Note: You should spend 30% of time on these!**

1. U.S. health spending per capita in 2007 was
  - a. less than \$2,000
  - b. between \$2,000 and \$4,000
  - c. between \$4,000 and \$6,000
  - d. more than \$6,000.
  
2. The major uses of health care funds in the U.S. are in order of largest to smallest
  - a. physicians, hospitals, drugs
  - b. physicians, drugs, hospitals
  - c. hospitals, physicians, drugs
  - d. hospitals, drugs, physicians
  
3. If a company insures 100 identical consumers who each have expected health expenses of \$5,000 with a standard deviation of \$5,000, then an insurance company will expect that with probability 0.95 that the average of claims of the 100 insured will be
  - a. between \$0 and \$10,000
  - b. between \$4,000 and \$6,000
  - c. between \$4,900 and \$5,100
  - d. none of the above.
  
4. The article by Pauly “The Economics of Moral Hazard”
  - a. showed that health insurance led to welfare loss due to moral hazard
  - b. proposed the use of deductibles, coinsurance and copayments to reduce this moral hazard
  - c. both a. and b.
  - d. neither a. nor b
  
5. Health care organization in order of increasing management is
  - a. FFS, POS, HMO
  - b. FFS, HMO, POS
  - c. POS, FFS, HMO
  - d. none of the above.
  
6. In the Grossman model utility is a function of
  - a. expenditure on medical goods and expenditure on nonmedical goods
  - b. expenditure on medical goods and the level of health capital
  - c. expenditure on nonmedical goods and the level of health capital
  - d. none of the above.

7. Allowing for training time and costs physician income is
  - a. high and similar for general practitioners (GP's) and specialists
  - b. high for general practitioners (GP's) and even higher for specialists
  - c. not unusually high once one controls for the training time and costs
  - d. none of the above
  
8. As a consequence of the shift to managed care for hospitals
  - a. cost-shifting has increased
  - b. cost-shifting is unchanged
  - c. cost-shifting has decreased
  
9. Most pharmaceutical drug discoveries fail to lead to a marketable drug due to
  - a. abandonment before reaching Phase III trials
  - b. abandonment due to failure during Phase III trials
  - c. abandonment for economic reasons despite success during Phase III trials.
  
10. A pure public good may be underprovided without government intervention because
  - a. people are ill-informed
  - b. people are not rational even if they are well informed
  - c. it is difficult to get people to reveal how much the public good is worth to them
  - d. none of the above.
  
11. Medicare and Medicaid combined have expenditures of approximately
  - a. \$20 billion
  - b. \$80 billion
  - c. \$200 billion
  - d. \$800 billion
  
12. Medicare is expected to become insolvent in the next ten years because
  - a. state governments are finding it increasingly difficult to balance their budgets
  - b. health care costs are forecast to continue to increase well above the rate of inflation
  - c. both of the above
  - d. neither of the above.

13. The marked increase in average life expectancy in the world really began
- 2,000 years ago
  - 1,000 years ago
  - 200 years ago
  - 100 years ago.
14. The article by Cutler and McClellan
- placed a value of \$50,000 on a LY
  - placed a value of \$50,000 on a QALY
  - placed a value of \$100,000 on a LY
  - placed a value of \$100,000 on a QALY
15. The recent rise in obesity in the U.S. is felt to be due in part to
- increased inactivity
  - increased consumption of food
  - neither of the above
  - both of the above
16. In the U.S.
- roughly one-third of adults are obese and an additional one-third are overweight
  - obesity rates have increased appreciably since 1980
  - both a. and b.
  - neither a. nor b.
17. Cross-country comparisons reveal that
- health care is an inferior good
  - health care is a normal good
  - health care is a superior good
  - none of the above.
18. Health care is primarily paid for
- by government in wealthy countries
  - out of pocket in poor countries
  - both a. and b.
  - neither a. nor b.