Cameron　　　**ECON 132 (Health Economics): FINAL EXAM (A)**　　　**Fall 2019**

Answer all questions in the space provided on the exam.
Total of 60 points (and worth 45% of final grade).
Read each question carefully, so that you answer the question.

Short Answer (6 points each question)

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

(a) True   False　　Over 20% of the population is covered under Obamacare policies.

(b) True   False　　Payment of hospitals by diagnosis related group encourages over-servicing

(c) True   False　　Negotiated payment per patient bed day is an example of capitation.

(d) True   False　　It is possible to be simultaneously covered by Medicare and by Medicaid.

(e) True   False　　Life expectancy in 2018 is a forecast of average life expectancy for
　　　　　　　　someone born in 2018 using 2018 death rates at each age.

(f)   True   False　　For public health policy purposes a good measure of the value of a life
　　　　　　　　saved is the present discounted value of future earnings.

2.(a) You are given the following diagram for someone facing either X = 20 with probability 0.5 or X = 100 with probability 0.5.
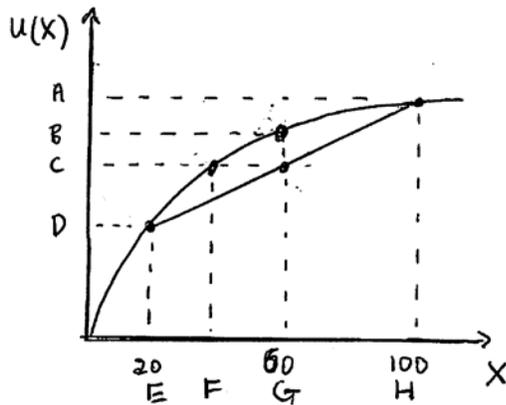
(i) The utility obtained from full insurance at the actuarially fair premium is given by which point (**circle one**): A B C D E F or G.

(ii) As drawn the individual is which one of the following (**circle one**):
risk-averse, risk-neutral, risk-prefer or there is insufficient information to answer the question.

(b)(i) Suppose an insurance company sells insurance to 400 people each of whom has independent and uncertain health expenses, with common mean $20,000 and standard deviation $10,000. What interval will the average claim per individual insured person lie in with probability 0.95?

(ii) Consider the market for used cars and let X = value of the car.
Sellers know the value of the car they sell and their utility is U(X) = X.
Buyers only know that car value is uniformly distributed on (50,150) and their utility is 1.5×X.
Suppose the posted price for used cars is 90. Will consumers buy a car at this price?
Explain your answer.

(c)(i) The Manning et al. paper on the Rand Health Insurance experiment in Table 2 found that adjusted total expenses were $550 under the 95% plan (which has an effective coinsurance rate of 30 percent and were $750 under the free plan. Calculate the arc price elasticity of health care demand.

(ii) What category of health service -- inpatient or outpatient -- was found to be most price responsive in the Rand health insurance experiment?

3.(a) On an appropriate diagram show **consumer choice between consumption of non-health goods and the level of health**. Now suppose the person, previously uninsured, receives a health insurance policy from the government at no cost.
(i) On the same diagram, show the effect on consumer choice between consumption of non-health goods and level of health.

(ii) State, with explanation, whether or not out-of-pocket expenditure on medical goods consumption has increased **for your diagram.**

(b) Consider the following screening test for cancer applied to 100,000 people of whom 1,000 have cancer. Each test costs $10, picks up 90% of cancer cases, and additionally 10% of the time falsely diagnoses cancer. Detection of cancer (rightly or wrongly) leads to a further exact diagnostic test that costs $100. Correct early detection of cancer by the test is valued at $10,000. Is the first test worthwhile? Explain your answer.

(c) Consider the following diagram.
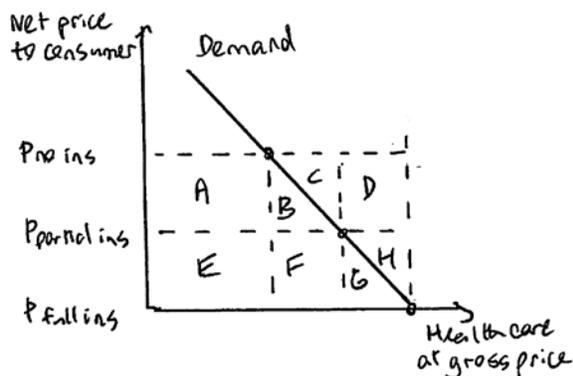
(i) Give the combinations of A, B, …, H that show change in society's health expenditures in going from partial insurance to complete insurance.

(ii) Give the combinations of A, B, …, H that show the change in society's well-being in going from partial insurance to complete insurance.

4.(a) On appropriate diagrams show why a profit-maximizing firm holding a patent for a drug that has constant marginal costs of production and delivery will nonetheless charge different prices for the drug in different countries.

(b) Suppose many physicians also own MRI facilities. On an appropriate diagram show the likely impact on market price and quantity of MRI's.

(c) (i) On an appropriate diagram show the impact of licensure on price and quantity of medical services (assuming licensing of doctors does not change people's preferences to see doctors). **(ii)** On the same diagram show the welfare loss or welfare gain due to licensure.

5.(a) Consider two individuals with different demand curves for a good that is a pure public good. The two consumers are the only people demanding the public good. On an appropriate diagram show the optimal amount of the public good by drawing demand curves for each individual and any additional curves needed.

(b) Consider vaccination against a contagious disease. If a person is vaccinated there is a direct benefit to the person (they are less likely to get the disease), as well as an indirect benefit to others (someone vaccinated is less likely to pass the disease the disease on to others. Vaccination costs $20. **Show on an appropriate diagram** that a competitive market will lead to too few people having vaccinations. On the same diagram **show the welfare loss to society.**

(c) In assignment 5 we analyzed drug prices (price), life years gained (lyg) and drug prices per life year (plyg) gained.

(i) Provide a clear policy relevant interpretation of the slope coefficient in this output.

```
. regress lnprice lnlyg, vce(robust)
```

		Robust				
lnprice	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnlyg	.9865702	.1678911	5.88	0.000	.6501088	1.323032
_cons	4.600351	.1952273	23.56	0.000	4.209107	4.991596

(ii) Provide a clear policy relevant interpretation of the slope coefficient in this output.

```
. regress lnplyg year, vce(robust)
```

		Robust				
lnplyg	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
year	.0976528	.0255998	3.81	0.000	.0463702	.1489353
_cons	-191.3058	51.43277	-3.72	0.000	-294.3381	-88.27363

6.(a) Provide a plot of life expectancy (across countries) against income per capita, paying attention to the slope and curvature of the plot.
On the same diagram show where the U.S. lies in relation to the curve.

(b) Consider the paper by Cutler and McClellan "Is Technological Change in Medicine Worth It"

(i) Did the paper rely on cost-benefit analysis or on cost-effectiveness analysis?

(ii) What was the conclusion of the paper?

(c) Consider a policy that came into being in 1995. We have data for 1990 and 2000. The policy affected one group but not the other. We have the following table for the average of the outcome Y in various groups at various points in time.

	Affected by policy	Not affected by policy
Year = 1990	4	2
Year = 2000	10	7

Give the difference in differences estimate of the effect of the policy. **Show computations.**

(ii) Suppose we had individual-level data for the preceding policy example.
Let T = 0 in 1990 and T = 1 in 2000. And let P = 1 if affected by policy & P = 0 otherwise.
We run the following regression $Y = a + b\,T + c\,S + d\,T \times S + \text{error}$.
Which coefficient will give the difference in differences estimate of the effect of the policy:
Circle one of the following: **a   b   c   d   none of these**

7. In assignment 4 we obtained the following Stata output for outpatient spending.

```
. regress out_infl coins25 coins50 coins95 coinsindiv, vce(robust)

Linear regression                               Number of obs   =      3,362
                                                F(4, 3357)      =       9.11
                                                Prob > F        =     0.0000
                                                R-squared       =     0.0110
                                                Root MSE        =     1850.2

               |               Robust
      out_infl |     Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------+----------------------------------------------------------------
          plan |
     25% Coins |  -378.8534   82.80691    -4.58   0.000    -541.2105   -216.4963
     50% Coins |  -434.6874    156.058    -2.79   0.005    -740.6658   -128.7089
 95%/100% Coins|  -437.6573    91.6754    -4.77   0.000    -617.4026    -257.912
   Indv Deduct |  -409.0339   92.28165    -4.43   0.000    -589.9678   -228.0999
         _cons |   1313.562   56.18443    23.38   0.000     1203.403    1423.721
```

(i) Which insurance category was omitted?

(ii) Provide an interpretation of the coefficient for the 50% plan.

(iii) What was the difference in average spending across the 25% and 50% plans?

(iv) Are the different insurance plans jointly statistically significant at level 0.05? Explain your answer.

(v) Suppose we instead give the Stata command
```
regress out_infl coins0 coins25 coins50 coins95, vce(robust)
```
Will the result of the test in part (iv) be unchanged? A simple **yes** or **no** will do.

(vi) Suppose we want to get a 95% confidence interval for level of outpatient spending under the 0% coinsurance plan. Give a Stata command that will directly give this.

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

1. The three major uses of health funds in the U.S., ordered from largest to smallest, are

a. physicians, hospitals, pharmaceuticals

b. hospitals, pharmaceuticals, physicians

c. pharmaceuticals, hospitals, physicians

d. none of the above.

2. Suppose the price elasticity of demand for health care is zero. Then

a. the welfare loss due to moral hazard is high

b. the welfare loss due to moral hazard is low to moderate

c. there is no welfare loss due to moral hazard

d. any of the above are possible.

3. John obtains a major medical and hospital policy that covers all costs, aside from a $1,000 annual deductible and a 20% coinsurance rate. If John actually incurs annual health charges of $4,000, by how much will his health insurance company reimburse him?

a. less than $1,000

b. between $1,000 and $1,999

c. between $2,000 and $2,999

d. more than $3,000**.**

4. Studies revealed that

a. HMO's on balance provide a lower quality of care than traditional FFS insurance

b. HMO's on balance provide similar quality of care to traditional FFS insurance

c. HMO's on balance provide a higher quality of care than traditional FFS insurance

5. Suppose a risk-averse person's expected health expenses equals the actuarially fair premium for the policy. Then

a. they will definitely buy the insurance policy

b. they will definitely not buy the insurance policy

c. they are indifferent between buying and not buying the policy

d. it's unclear given the information - they may either buy or not buy the policy.

6. The article by Neuhauser and Lewicki, "What Do We Gain from the Sixth Stool Guaiac?"? presented in the coursepack and discussed in class found that

a. that it is best to have less than six Guaiac tests

b. it is better to have no Guaiac test than to have six tests

c. neither a. nor b.

d. both a. and b.

7. The California website for "Obamacare" health insurance is called

a. California Cares

b. Covered California

c. Insured California

d. none of the above

8. Suppose treatment A costs $20,000 and leads to one more year of life while treatment B costs $50,000 and leads to two more years of life. Then for gaining a year of life the incremental cost-effectiveness ratio of treatment A compared to treatment B is

a. $20,000

b. $30,000

c. $40,000

d. $50,000

9. Doctor's pay in the U.S. is high due to

a. high return on training

b. high training costs

c. neither a. nor b.

d. both a. and b.

10. The main reason for the dramatic increase in the real cost of a hospital patient bed day over the past fifty years is

a. increased price of medical equipment

b. increased quantity of medical equipment

c. increased wages and salaries

d. increased use of labor

11. The economic rationale for patent protection for prescription drugs is

a. internalization of a positive externality

b. privatization of a public good to make it excludable

c. redistribution of income to wealthy corporations

d. creation of a monopoly that will maximize consumer surplus

12. The economic rationale for Medicare is

a. avoid failure of the market for health insurance for elderly

b. avoid negative externalities from disease transmission

c. avoid private monopoly in the market for health insurance for elderly

13. Medicare sets reimbursement rates for providers of

a. outpatient physician services

b. outpatient pharmaceutical drugs

c. neither a. nor b.

d. both a. and b.

14. Medicaid

a. is insurance for the poor

b. is jointly funded by state government and federal government

c. neither a. nor b.

d. both a. and b.

15. The marked increase in average life expectancy in the world really began

a. 10,000 years ago

b. 2,000 years ago

c. 1,500 years ago

d. 200 years ago.

16. Very large variation from region to region in the U.S. of the use of C-sections (rather than vaginal delivery) for child birth is viewed as a sign of

a. overuse of medical technology

b. underuse of medical technology

c. neither of the above.

17. Cross-country comparisons reveal that

a. health care is an inferior good

b. health care is a normal good but not a superior good

c. health care is a superior good

d. none of the above.

18. Compared to other highly developed countries the U.S. has

a. High rates of health insurance coverage

b. low infant mortality rate

c. neither a. nor b.

d. both a. and b.