

**Econ 132 Fall 2016 SAMPLE SECOND MIDTERM EXAM: SOLUTIONS Cameron**

**1.(a)** MB:  $.02 \text{ lower probability of heart attack} \times 4 \text{ QALY} \times \$100,000 = 0.8 \times 100,000 = \$8,000$ .  
 MC:  $\$10,000 \text{ per year}$ . No it does not favor PCSK9 inhibitors as  $MB < MC$ .

**(b)(i)** PCSK9 inhibitors stop  $0.04 - 0.02 = 0.02$  heart attacks per year.  
 PCSK9 inhibitors cost  $\$10,000$  per year.

Cost per heart attack avoided =  $10,000 / 0.02 = \$500,000$ .

**(ii)** Heart attack saved gives 4 Qalys so Cost per QALY =  $\$500,000 / 4 = \$125,000$ .

**(c)** Cost of first test =  $\$20 \times 100,000 + \$100 \times 0.6 \times 500 + \$100 \times 0.1 \times 100,000 = \$3,030,000$ .

Benefit of first test =  $\$20,000 \times 0.6 \times 500 = \$6,000,000$ .

Test is worthwhile as  $MB > MC$ .

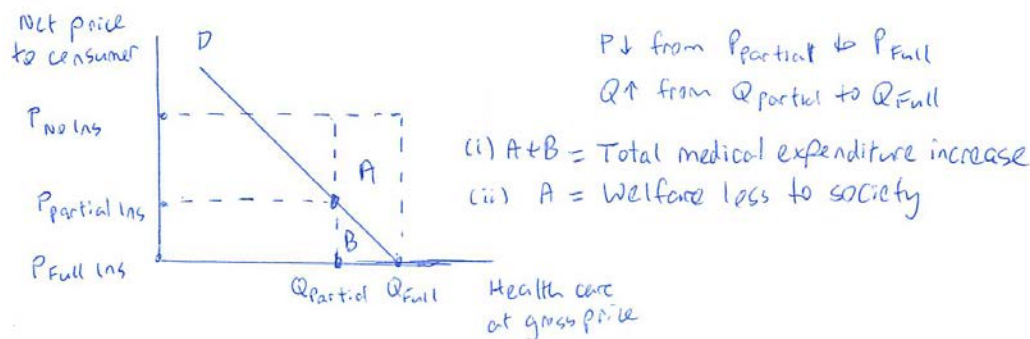
[Note: An alternative calculation uses lower number of false negatives and also gets full credit.

Cost of 1st test =  $\$20 \times 100,000 + \$100 \times 0.6 \times 500 + \$100 \times 0.1 \times (100,000 - 500) = \$3,025,000$ .]

**2.(a)(i)** D (corner solution) is society's optimum in the absence of moral hazard.

**(ii)** H (tangency with curve) is society's optimum in the presence of moral hazard.

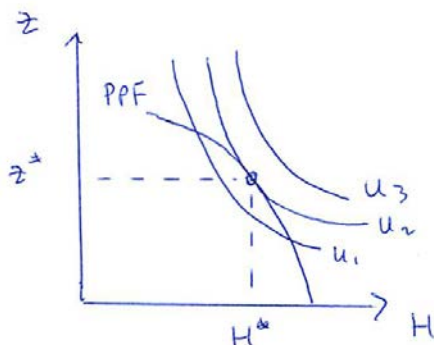
**(b)** Moving from partial health insurance to complete health insurance.



**(c)**  $E[X] = 70$  as uniform on  $(50, 90)$  (where 90 is the posted price) has mean 70.

$E[U(X)] = 1.5 \times E[X] = 1.5 \times 70 = 105$ . Since this is greater than the price of 90, do buy.

**3.(a)(i)** Tradeoff between health capital (H) and other goods (Z)



**(ii)** Higher educated person most likely has better ability to produce health as better educated.

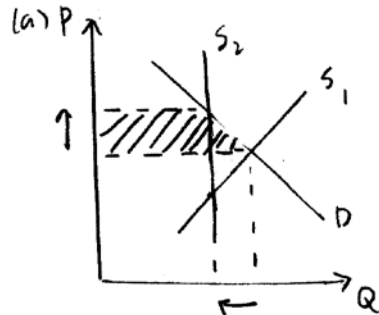
This pushes out the PPF curve for the higher educated. Indifference map is unchanged.

(Will reach higher indifference curve, most likely with higher  $H^*$  and higher  $Z^*$ ).

- (b)**  $U = U(H, Z)$  Utility is a function of Health capital and consumption of other goods  
 $H = H(M)$  Health capital is produced by medical goods and services M  
 $I = p_z Z + p_m M$  Budget constraint Income = other goods spending + health spending

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3.(c) Impact of licensure on price and quantity of medical services



(ii) shaded area is  
loss in consumer surplus

- 4.(a) **False** The Rand experiment was unable to find lowered mortality.  
 (b) **False** By law Medicare is prevented from doing this.  
 (c) **False** PDV of future earnings are used in individual liability suits, not for health policy.  
 (d) **False** This extension is done in the text and course notes. .  
 (e) **True** The original impetus of licensing of doctors was to improve doctor quality.  
 (f) **True** Negotiated payment per patient bed day is an example of capitation.

5.(i) **sum waz if high==1 & year==93 or sum waz if high==1 & year==93**  
**or regress waz if high==1 & year==93**

(ii) From 1993 to 1998 mean waz for high treatment increases by  $0.32 - (-0.54) = 0.86$ .

(iv) In 1998 mean waz for high treatment is  $0.32 - (-0.07) = 0.39$  higher than low treatment.

(iv) Change for high is  $0.32 - (-0.54) = 0.86$  and for low is  $-0.07 - (-0.41) = 0.34$ .

Difference in difference estimate is  $0.86 - 0.34 = 0.52$ .

Or Difference (high vs. low) in 1998 is  $0.32 - (-0.07) = 0.39$  and in 1993 is  $-0.54 - (-0.41) = -0.13$ .

Difference in difference estimate is  $0.39 - (-0.13) = 0.52$ .

(v) This is the difference-in-difference estimate. So 0.52.

(vi) This is the difference between waz across treatment groups in 1998:  $0.32 - (-0.07) = 0.39$ .

**Multiple choice**

Question	1	2	3	4	5	6
Answer	d	a	b	b	b	d