ECONOMICS 100
TERM TEST #1
Monday November 10, 2008

SOLUTIONS

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1. Duration of Test: 90 minutes

2. There are 6 questions of unequal value:

1.	Yes or No / Explaining Concepts	22
2.	In the News	23
3.	The Obama Plan	11
4.	Work-Leisure Choices	20
5.	The Party After This Test!	14
6.	Multiple Choice	10
	TOTAL	100

1. Yes or No and Explaining ECO 100 Concepts (22marks)

1.1 Yes or No

(12) Here is an easy way to start this test … just circle either **Yes** or **No** for the following statements to indicate whether you agree ("Yes") or disagree ("No") with each of them. Thank your kindly prof for not including a penalty for a wrong answer!
(Assume positively-sloped Supply and negatively-sloped Demand as appropriate).

a)	In an economy that produces two goods, a reduction in the unemployment of labour will shift the Production Possibility Curve outwards. Max production does not change, so PPC does not shift; economy moves "closer" to PPC	**No**
b)	The demand schedule for a good is given by this equation: P = 100-2Q. For this demand schedule, the price elasticity of demand at Q = 25 has a value of 1. Ed = -[Δq/Δp]*[p/q] = -[-100/50]*[50/25] = 1	**Yes**
c)	An effective price floor will cause excess demand. No, it creates an excess supply.	**No**
d)	The less elastic the demand schedule, the greater the burden of an excise tax that will be borne by consumers. The less elastic the D schedule, the higher the price will rise for a given tax increase → the greater the burden on consumers.	**Yes**
e)	There is no difference between these two equilibrium equations in ECO 100 Consumer Theory, as one equation can be transformed mathematically into the other: a) MUx / MUy = Px / Py b) MUx / Px = MUy / Py There is a difference! First line above refers to Indifference Theory that does not require measureable utility; there are no units of measurement on the LHS or RHS of the equation. Second line refers to Utility Theory which does require measurement of satisfaction.	**No**
f)	According to indifference theory, if the Marginal Rate of Substitution between pizza (X axis) and colas (Y axis) is 4 and the price ratio is 2, the consumer should buy more pizza and fewer colas to maximize satisfaction. MRS = 4 and Pp/Pc = 2. Need MRS to be equal to price ratio for eq'm. Buy more pizza and less colas and MRS will fall.	**Yes**

1.2 Explaining ECO 100 Concepts

(10) In your own words, without diagrams or equations, explain the ECO 100 concepts shown below. The answer needs to demonstrate that you understand the meaning of each term. Your response cannot just be a recitation of an equation or a geometric term "spelled out" in words. [For instance, in answer to part a) Opportunity Cost, stating that "it is related to the slope of the Production Possibility Curve" may be true, but it won't get you any marks!]
There are various ways to demonstrate understanding; below shows some ways.

a) Opportunity Cost

The benefit given up when choosing to do something; or
The next most valuable choice; or
The value of the next best alternative; or
What is sacrificed when something is selected.

b) Consumer Surplus

The difference between the total value a consumer places on all the units consumed and what the consumer actually pays for those units.

[Not acceptable: Area under the Demand Curve above the price – this does not provide evidence that the underlying ECO meaning is understood]

c) Marginal Rate of Substitution

The rate at which a consumer can trade one good for another, along an indifference curve, while holding satisfaction constant.

[Not acceptable: MRS = MUx/MUy; this is merely a formula]

d) Substitution Effect of a Price Change

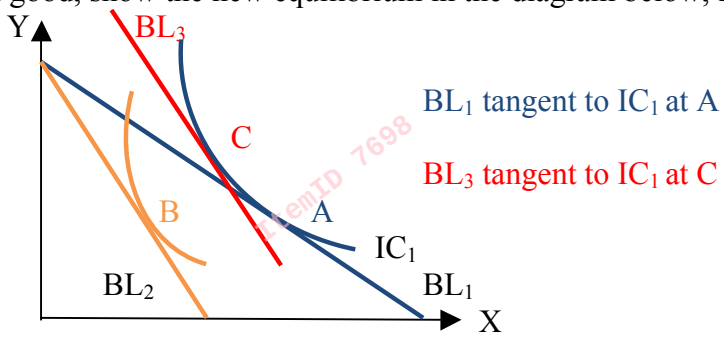
The change in the quantity demanded of a commodity when its price changes, while holding real income constant (or while holding satisfaction constant).

2. In the News (23 marks)

2.1 Tax and Subsidy Plan

In the recent federal election, one party proposed a tax on carbon to reduce the consumption of certain goods that contribute to global warming and an "offsetting" income subsidy to households. Let's analyze a version of this plan, using indifference theory (with convex indifference curves).

a) (3) Harper has a fixed income and is buying some of both Good X and Good Y (at given fixed prices). Show Harper's initial equilibrium in the diagram below, labelled as Point A. The government imposes an excise tax on Good X which raises its price (the "carbon tax"). If X is a normal good, show the new equilibrium in the diagram below, labelled point B.



b) (3) Point B must have a certain relationship to Point A in terms of its "location" in the diagram. What is that relationship? Briefly explain why this relationship holds.

It must be to the left of Point A i.e., less X. Because X is a normal good (and SE>IE), the demand for X is negatively-sloped. So as P rises, quantity demanded falls.

c) (3) Now consider an income subsidy to Harper from the government – its size is just enough to permit her to reach her original level of satisfaction. Show this equilibrium on the diagram above, labelled Point C. Add BL_3 parallel to BL_2 tangent to IC_1 to left of Point A and to right of Point C (since X is normal good)

Answer the following questions about this "tax and subsidy scheme":

d) (3) Does the scheme cause Harper to reduce her consumption of Good X?
(Yes / No / Cannot determine this)

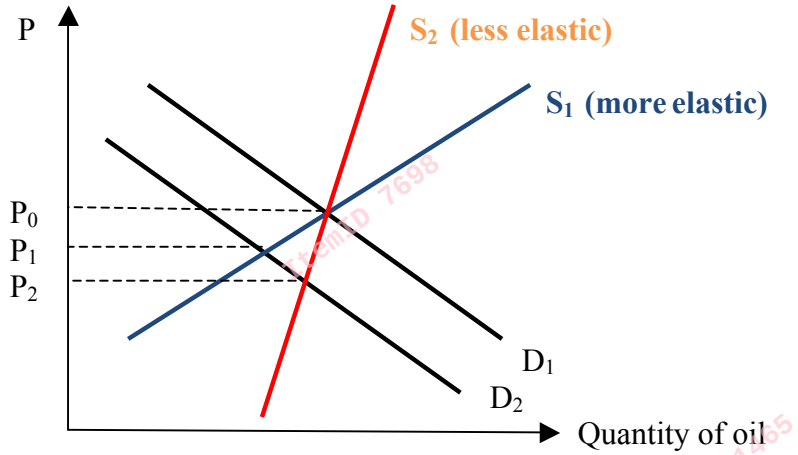
Can Harper buy the same quantity of both X and Y that she did in the original equilibrium?
(Yes / No / Cannot determine this)

e) (2) What does the move from Point A to Point C represent?
(Income Effect / Substitution Effect / Giffen Good Effect / Price Consumption Curve / X is a normal good) [circle all that apply]

2.2 Fluctuating Commodity Prices in World Markets

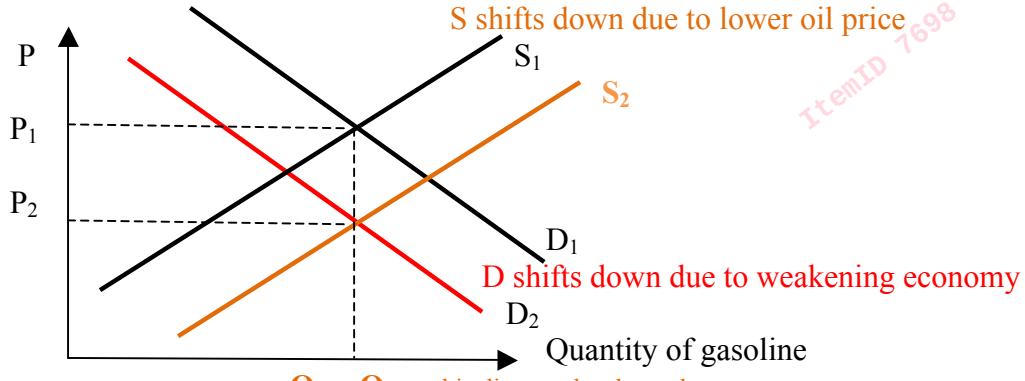
Most of you are well aware of the recent substantial swings in commodity prices e.g. oil. Here is a quote from the Economist newsmagazine (October 17, 2008): *"One of the reasons for the price swings is that the supply cannot change quickly in the short term. It takes years to develop a new oil field. So any surprise on the demand side can translate into big price changes."*

a) (5) Using the diagram below, with negatively-sloped D and positively-sloped S, analyze the above statement, for a decrease in demand. In particular, show how the price elasticity of supply affects the change in the price of oil. No explanation needed, if your diagram is clear and well-labelled.



The less elastic the supply curve, the greater the change in price from a change in demand.

b) (4) Let's look now at the price of gasoline at the pumps. As this test was being developed, the price of gasoline was at a two-year low. Use the diagram below to show why the price of gasoline, a normal good, has been falling recently. Consider both the supply side of the market (and a lower price of oil, an input to gasoline) and the demand side of the market (reflecting drivers' changed habits as the economy weakens). No explanation needed … just a well-labelled diagram showing S_1, D_1, P_1, Q_1, etc. (You need only shift curves once to show the direction of a change.)

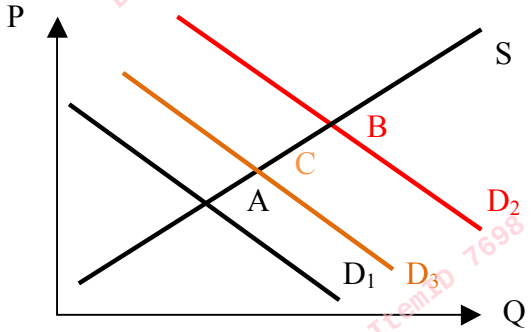


$Q_1 = Q_2$ as this diagram has been drawn
(Q2 could be higher or lower)

3. The Obama Plan (11 marks)

U.S. President-elect Obama wishes to encourage greater participation in post-secondary education (PSE). In the recent campaign, he announced a plan to give every student[1] a grant of $5,000 towards PSE. Imagine that there is a "traditional" market for PSE in which there is negatively-sloped Demand and positively-sloped Supply and that the price of PSE is determined solely by market forces. (Ok, you need a lot of imagination!)

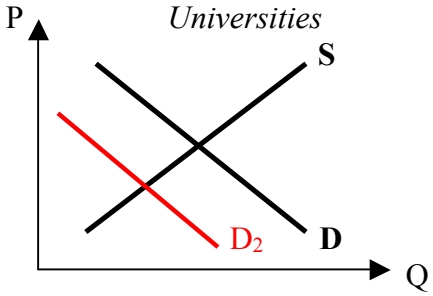
a) (2) In the space below, show the initial equilibrium (Point A) and a new equilibrium (Point B) after the $5,000 grant plan is put in place. Assume PSE is a normal good.

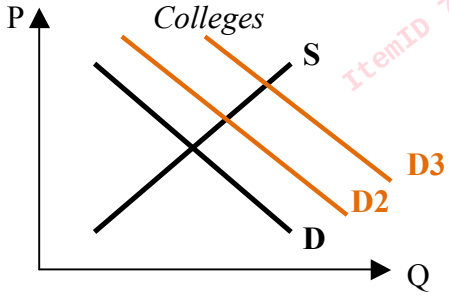


b) (3) Now suppose that the plan is altered so that the $5,000 amount is a loan, not a grant, and therefore must be paid back over a few years after graduation (no interest charged; everybody graduates!). Show this equilibrium as Point C above. Briefly explain your answer in this case, compared to the grant case above:

The value the loan is lower (an interest subsidy only) or there is a burden of debt to be repaid. This causes fewer students to take up the offer, so D does not increase as much.

c) (3) Go back to the $5,000 grant. Now consider two types of post-secondary education: universities and colleges. Suppose that the grant applies only to colleges. The two diagrams below show an initial equilibrium in each case; now show what happens in each of the "sub-markets" after this version of the grant program is introduced.[2]





[1] Every student who performs 100 hours of community service – this is not relevant for our question.
[2] Keep in mind the protocols developed in class for inter-related markets i.e., "one round" only from a shock in a market.

d) (3) Briefly explain your answer at the bottom, of the previous page; i.e., what are the effect(s) in each of the "sub-markets" and why?

In the university market:

- A reduction in demand as some students transfer out to go to college (attracted by the grant)

Two forces at work in the college market:

- The students who transferred from university shift up Demand
- New participants to PSE, induced by the grant to attend, shift up Demand too.

The rest of this page is blank!

Alternate Solution to this Question

This question and the marks allocated to it were based on shifting of demand schedules, as shown above in part a) and part b), on the premise that the grant or loan are income supplements. The hint that this approach was expected is in the information that PSE is a normal good.

However, an alternate argument could be made that the benefit provided (either a grant or a loan) could be analyzed by shifting the supply schedule downwards, thereby making it explicit that there will be a gap between the price paid by students (consumers) and the price received by PS institutions (producers). In other words, this question could be seen as involving an excise subsidy (the opposite of an excise tax). Indeed, an argument could be made that this is the correct approach.

[Aside: an excise subsidy can be demonstrated by shifting the demand schedule, but it would still require differentiating between price paid and price received – this was not required in the solution shown above.]

Answering the question as an excise subsidy would involve considerably more work, beyond the minimal marks assigned. Once again, this might have been a signal not to go down that pathway!

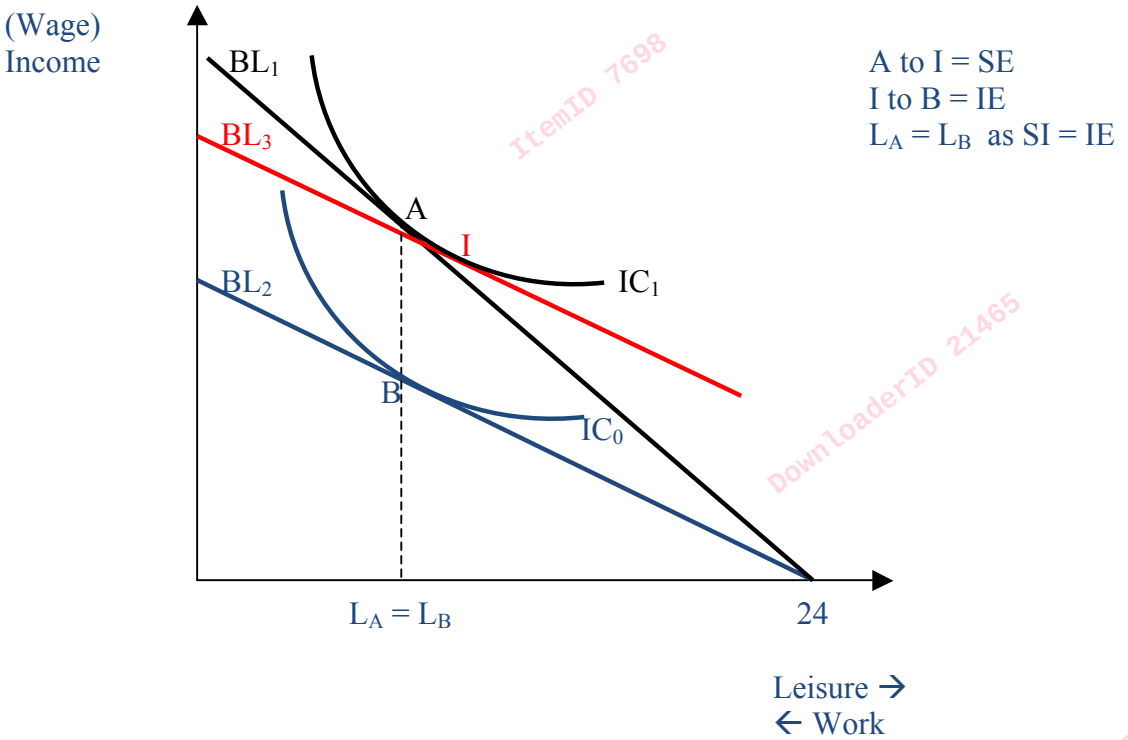
To forestall any excessive pondering on these two options, the question should probably have stated explicitly that you were to take the grant/loan as an income supplement. [Oh, the perils of constructing test questions without gremlins lurking!!]

4. Work-Leisure Choices (20 marks)

This is a two-part question about work-leisure choices. Use a fully labelled indifference diagram in each case that includes the Substitution Effect (SE) and the Income Effect (IE) as needed in order to analyze the situation. As in class, assume a 24-hour day and a worker freely able to vary the hours worked. Also assume that Leisure is a normal good. The worker's preference map has convex indifference curves that do not change.

4.1 (13) In class, we did a poll of what you would do if your wage rate was reduced. Some of you said work more, some said work less and some said work the same amount. In the diagram below, show the case for Sari, a student who said she would work the same number of hours, even though the wage rate had fallen. (Assume Sari does work some hours). Be sure to clearly indicate SE and IE as needed.

Note: BL_1 is tangent to IC_1 at Point A; BL_3 is tangent to IC_1 at Point I



In this situation:

a) The opportunity cost of leisure has **(risen / fallen / stayed the same).**

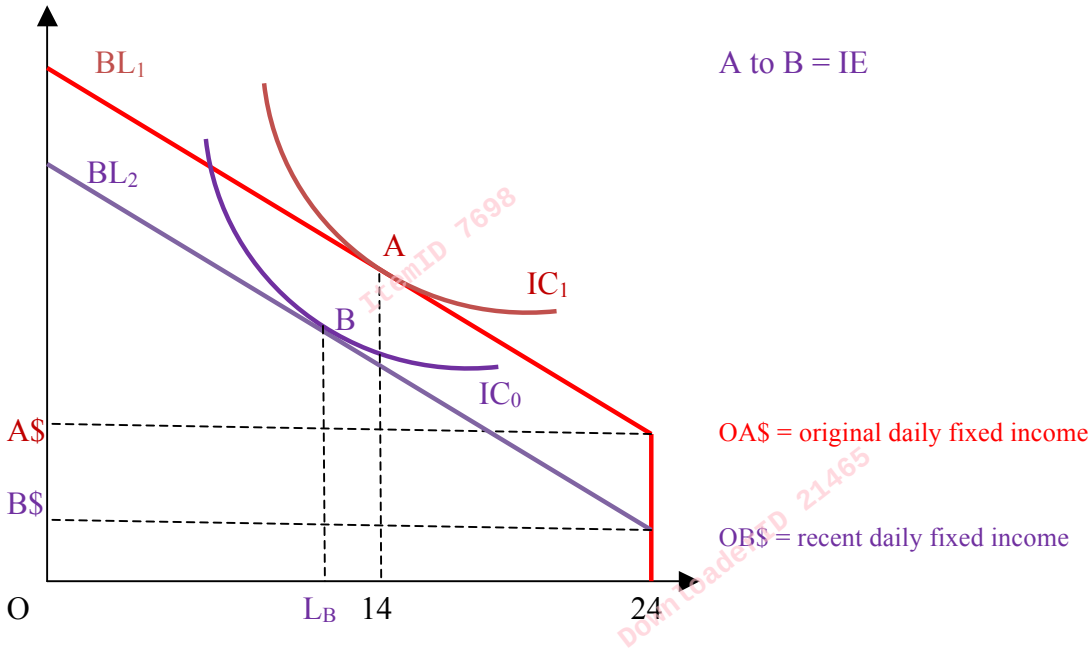
b) The Substitution Effect (SE) causes Sari to work **(more / less / same)** number of hours.

c) The Income Effect (IE) causes Sari to choose **(more / less / same)** hours of leisure.

4.2 (7) Consider another worker, Wally, who has a certain fixed daily income from his investments. He has been working 10 hours per day at his job. [Note: this question avoids the use of specific numbers for the wage rate and for the level of investment income per day; you can still draw a diagram!]

a) Show his initial equilibrium in the indifference diagram below. Label this initial equilibrium as Point A.

Axes as in 4.1



b) Oops, the recent financial market meltdown means that Wally is now receiving a smaller amount per day of investment income. On that basis, show a possible point of equilibrium for Wally in the diagram above, labeled Point B. Be sure to clearly indicate SE and IE as needed.

c) The analysis of this question requires the application of

(SE only / IE only / both SE and IE / neither one).

5. The Party After This Test (14 marks)

Sandy decides to celebrate after this ECO 100 test by consuming cans of beer (B) and bags of potato chips (C). The price of one can of beer is $6 and one bag of chips is $3. His party budget is $54. With Beer on the Y-axis, his Marginal Rate of Substitution (MRS) between the two goods is given by this equation: MRS = B/2C. For example, if he consumes 2 cans of beer and 1 bag of chips, his MRS is equal to 1.

a) (1) If Sandy decides to buy only beers, how many cans of beers can he buy?

$I/P_B = \$54/\$6 = 9$

Max B = __**9**_____

b) (2) What is the slope of his Budget Line (BL)?

Slope = $- P_C/P_B = - \$3/\$6 = -1/2$

Slope of BL = ____ **-1/2**_____

c) (6) What combination of C and B maximizes Sandy's satisfaction? Show your work.

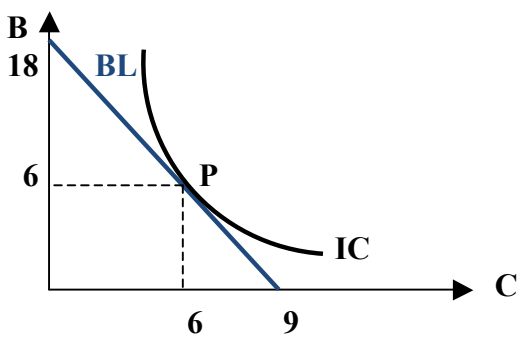
Solve these two equations (i.e., 2 equations in 2 unknowns):
Eq'n 1: Budget Line: 3C + 6B = 54
Eq'n 2: Tangency Point: MRS = P_C/P_B i.e. B/2C = 1/2

Units of B = _____**6**_____ Units of C = ____**6**_____

d) (2) What is the value of the MRS at the equilibrium?

MRS = _____**1/2**_____ (i.e., **MRS = P_C/P_B**)

e) (3) In the space below, draw an indifference diagram that shows Sandy's equilibrium position, labeled P for party! Show values of the intercepts and values for the equilibrium.



6. Multiple Choice (10 marks)

Provide the best answer to the following multiple choice questions by circling your response directly on the question paper. A correct answer is worth 2 marks; no penalty for a wrong answer. Read questions fully before answering!

6.1 Suppose that in an hour, you can read 10 pages of your History text or 5 pages of your Sociology text. What is the opportunity cost of reading 1 page of your Sociology text?

a) A lower grade in your upcoming Sociology test
b) A higher grade in your upcoming History test
c) Reading ½ page of your History text
d) Reading 2 pages of your History text
e) Zero, as reading a textbook without considering the concepts is worthless.

6.2 *(From Web Quiz)* The price of apples at a local market rises from $2.95 to $3.05 per kilo, and as a result the quantity of apples that households purchase decreases from 5100 to 4900 kilos/week while the quantity of oranges that households purchase increases from 3950 to 4050 kilos/week. The cross-price elasticity is

a) -1.33 b) 1.33
c) 0.75 d) -0.75
e) None of the above.

6.3 *(From Web Quiz)* If per capita income decreases by 5 percent and household expenditures on fur coats decrease by 10 percent, one can conclude that the price elasticity of demand for fur coats is

a) elastic
b) inelastic
c) unity
d) positive
e) not determinable from the information given.

6.4 Suppose that the Royal Ontario Museum (ROM) decides to increase admission fees in order to generate more revenues for museum programs. ROM is implicitly assuming that:

a) the price elasticity of supply of museum programs is positive
b) the price elasticity of demand for museum visits is more than 1
c) the price elasticity of demand for museum visits is less than 1
d) the cross price elasticity of demand with the Art Gallery is 0

6.5 The paradox in the "paradox of value" (water-diamonds) arose from the

a) confusion between total utility and marginal utility
b) belief that goods with high total utility should command high prices
c) belief that goods with low total utility should command low prices
d) belief that a life-sustaining good should have a higher price than a decorative item
e) all but one of the above explanations
f) all of the explanations i.e., a) through d) above.