ECON 310 - MIDTERM 1

Version A

Circle correct answer in the multiple choice section. For the long-form questions write a short answer and use graphs to support your argument. Use notation used in class and be sure to label everything when using graphs. Total points possible: 100

1 Multiple Choice Part (16 Points - 2 per question)

1. A person who is currently actively looking for a job, but has a job that pays for 5 hours a week only is classified by the BLS as:

   (a) employed.

   (b) unemployed.

   (c) not in the labor force.

   (d) under 16.

2. If the labor force is 250,000 and the total population 16 years of age or older is 300,000, the labor-force participation rate is:

   (a) 83.3%.

   (b) 45.4%.

   (c) 79.5%.

   (d) 80.9%.

3. Use Figure 1 as reference.

	Year 1	
Good	**Quantity**	**Price**
Bread	30	$10
Computers	10	$50

	Year 2	
Good	**Quantity**	**Price**
Bread	40	$15
Computers	30	$60

Figure 1:

If Year 1 is the base year, the growth of real GDP is approximately

(a) 100%.

(b) 137.5%.

(c) 109.5%.

(d) 148%

4. Suppose we know the following about a lawn repair business: wages $15,000, profits $4,000, tax $ 3,000, parts $ 9,000. What is the contribution to GDP of this business using the product approach?

   (a) $22,000.

   (b) $31,000.

   (c) $26,000.

   (d) $27,000.

5. Which of the following is not a correct characterization of the U.S. business cycle?

   (a) Wages are pro-cyclical.

   (b) Employment is pro-cyclical.

   (c) Average labor productivity is counter-cyclical.

   (d) Money is pro-cyclical.

6. Discouraged workers are

   (a) those who quit working because they are dissatisfied with their jobs.

   (b) those unmotivated workers who bring down a country's productivity.

   (c) those who would like to find a second job to supplement their income, but have not yet found one.

   (d) those who have given up looking for work, even though they would like to be employed.

7. Real investment tends to be

   (a) procyclical and more variable than real GDP.

   (b) countercyclical and more variable than real GDP.

   (c) procyclical and less variable than real GDP.

   (d) countercyclical and less variable than real GDP.

8. GDP may inaccurately measure the value of aggregate output because it may not properly account for

   (a) the depreciation of consumer durables and production in the underground economy.

   (b) production in the underground economy and the true value of government production.

   (c) the true value of government production and the proper value of purchases and sales of used goods.

   (d) the proper value of purchases and sales of used goods and depreciation of consumer durables.

2 GDP (24 Points)

The Bakery uses $500 worth of wheat to make bread. The Restaurant uses $500 worth of wheat to make food and $1,000 worth of baked goods. Consumers directly consume the remaining $1,000 worth of baked goods.

	Wheat Farmer	Bakery	Restaurant	Lawyer's Office
Revenue	$ 1,000.00	$ 2,000.00	$ 3,000.00	$ 2,500.00
Intermediate good				
Wages	$ 300.00	$ 600.00	$ 800.00	$ 1,500.00
Interest	$ 50.00	$ 100.00	$ 50.00	$ 100.00
Taxes	$ 50.00	$ 50.00	$ 40.00	$ 400.00

Figure 2:

a) Refer to Figure 2. Calculate GDP 3 times using the separate approaches we discussed in class. (**12 Points**).

b) Refer to Figure 2. Assume in addition that $700 of wheat gets imported. Out of these $300 is used by the Bakery as intermediate good and the rest is used by households to make bread at home. Also a government appears that taxes households $200 and uses it to pay unemployment benefits to laid-off workers. Calculate GDP again using the 3 approaches. (**12 Points**).

3 Consumer Problem I (30 Points)

Consider a consumer who is assumed to have h units of time available, which can be allocated between leisure time, l, and time spent working, N^s. The time constraint for the consumer is $l + N^s = h$. The consumer derives utility from consumption C and leisure l, where $C > 0$ and $h \geq l \geq 0$. The preferences over consumption and leisure are defined by $U(C, l)$, which satisfies all three properties specified in the textbook. The consumer's budget constraint is given by

$$C = w(h - l) + \pi - T,$$

where π is dividend income and T is lump-sum taxes. Consider a consumer's utility maximization problem in which the consumer chooses consumption and leisure to maximize utility, taking market wage rate w, dividend incomes π, and tax payments T as given.

a) Draw the consumer's budget constraint in (C, l) space for the case in which taxes are less than dividend income, $(\pi - T) > 0$. **(10 points)**

b) Show that there is an optimal bundle of consumption and leisure that maximizes the consumer's utility given the budget constraint. Draw that bundle into the graph and write down the optimality condition that needs to hold at that point. **(5 points)**

c) Into the graph from question (b) add the following case. Suppose the government cuts taxes, T. What are the effects on the consumer's optimal choice of consumption? Draw it into the graph. **(5 points)**

d) What are the effects on the consumer's optimal choice of leisure from case (c)? **(5 points)**

e) Go back to case (b) and redraw that picture. Now suppose that the market wage rate, w, increases. What are the effects on the consumer's labor supply? Include this change into the new picture. **(5 points)**

4 Consumer Problem II (30 Points)

Consider an one period macroeconomic model which consists of a representative consumer with preferences $u(c_1, c_2) = 2\sqrt{c_1} + \sqrt{c_2}$ where c_1 and c_2 are two consumption goods traded in this market for a price of \$5 and \$8 respectively. The consumer has a time endowment of 100 hours. The wage rate is given as \$20 per hour. In addition the consumer has to pay lump sum taxes of \$200 to the government. The government finances fireworks with this money.

a) What is the income of the household in dollars **(5 points)**

b) Write down the consumer's budget constraint and draw the budget constraint into a graph. **(10 points)**

c) Write down the consumer's complete optimization problem (without solving it - so just the setup!) **(5 points)**

d) Write down the consumers optimality condition (without solving for the optimal bundle). **(10 points)**

BONUS: Solve the problem for optimal consumption.