Assignment 1

Total points: 100 Due date: 07/09/2018

- Answer all questions. You are free to use the internet and any mathematical software.
- Cite all your sources.
- Copying from each other would lead to disastrous consequences. :D

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1. Consider the following equations representing demand and supply:

$$D(p) = 100 - \sqrt{p}$$

$$S(p) = 30 + p^2$$

   (a) Solve for price and quantity in equilibrium. Report your results (show your work). Only report the result in which price and quantity are positive. Feel free to use Mathematica or any other software to solve, but show me your steps. (8)

   (b) Write the inverse demand and supply functions and solve again. What challenge do you face now? Do you still arrive at the same answer? (12)

2. We talked in class about consumer surplus, producer surplus and deadweight loss. Keeping that in mind, describe what would lead to the following:

   (a) Illustrate a scenario in which consumer surplus is 0. (5)

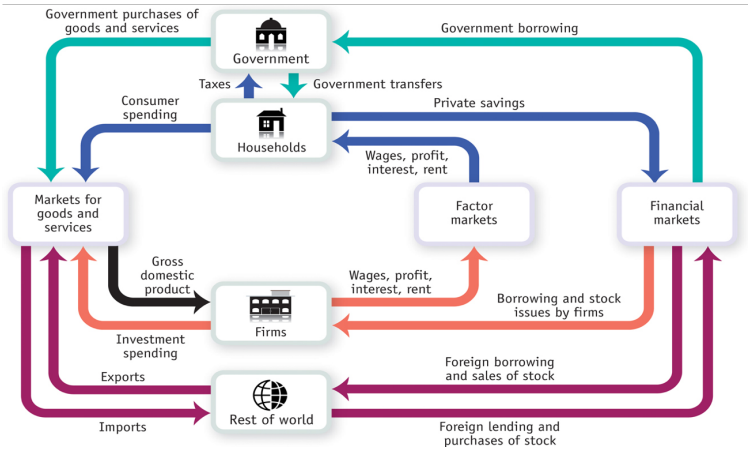
   (b) Illustrate a scenario in which producer surplus is 0. (5)

   (c) Illustrate a scenario in which both consumer and producer surplus are simultaneously zero. (7)

(d) In the above case, how do you interpret deadweight loss due to taxation? (3)

Consider linear functions to illustrate the type of functions that would result in the above scenarios. You do not need to specify functional forms. (Up to 5 bonus points for insightful intuition).

3. Consider the following chart:



**Source: Macroeconomics in Modules by Paul Krugman and Robin Wells

Describe in detail the flow for:

(a) Government. (5)

(b) Households. (5)

(c) Firms. (5)

(d) Rest of the world. (5)

Use sufficient examples and describe each element in at least as much detail as we did in class. Up to 10 bonus points for interesting additional information from the internet (Sources must be cited).

4. Consider the following table:

YEAR	PRICE OF GOOD 1 (IN USD/LB)	QUANTITY OF GOOD 1 (IN LBS)	PRICE OF GOOD 2 (IN INR/KG)	QUANTITY OF GOOD 2 (IN KGS)
1	2	50	100	40
2	3	51	110	43
3	4	43	115	61
4	7	67	120	45

Calculate the following in INR:

(a) Nominal GDP. (4)

(b) Real GDP using Year 2 as your base year. (4)

(c) GDP deflator. (4)

(d) Real GDP growth. (4)

(e) Inflation using GDP deflator. (4)

Assume 1 USD = 70 INR.

5. Explain in detail about CPI with respect to the following:

(a) Process and purpose of calculation. (7)

(b) Advantages. (3)

(c) Challenges. (5)

(d) How is it different from the GDP deflator? (5)

(e) How is is used to calculate inflation? (explain w.r.t. formula). (Bonus 5)

(f) How is it used to calculate real interest rate (explain w.r.t. formula). (Bonus 2)