Name:_____ UID:_____

Name of TA: _____

Instructions

- Exam time is 75 minutes.
- No materials other than yourself, a pen or pencil and the exam.
- Calculators are allowed but exchanging them is NOT allowed.
- No cell phones are permitted (for any reason).
- Please sign the bottom of the page, that record that you have not engaged in any cheating.
- One person at one time is allowed for restroom breaks. Please ask before going to restroom and please keep your visit as short as possible.
- You have to leave your cell phone on your desk when you go to the restroom.
- Budget your time wisely. Do not get stuck at a question, do your best and pass it. Try to attempt every question since partial grading is highly possible.
- The exam has two parts:
    - First part consists of 16 multiple choice questions. Please write the answers on the box provided at the beginning of the part.
    - Second part consists 3 short answer/graphs questions. In these questions, you have to SHOW YOUR WORK.

Good luck!

I sign my name as a witness that I have not cheated in any form in taking this midterm, as described above, and that all of the answers provided are by me and are of my own ability.

Signature: _____ Date:_____

PART 1: Multiple Choice (48 pts)

For each of the following questions, there is only ONE correct answer. Each question is worth 3 points.
Please write your answer to the boxes below:

Question	1	2	3	4	5	6	7	8	9	10
Answer	E	C	A	D	B	A	C	C	D	B
Question	11	12	13	14	15	16				
Answer	B	A	H	A	B	D				

1. If government abolishes an investment tax credit that was available in past years, then:
(a) interest rate will go up.
(b) saving curve will shift to the left.
(c) investment curve will shift to the left.
(d) there will be a movement along the saving curve in southwest direction.
(e) c and d.
(f) b and c.

2. Which of the following item is NOT recorded under investment category?
(a) Starbucks buys new espresso machines for its store in Westwood.
(b) Your parents recently bought a newly built house for $100,000.
(c) Your purchase of a new TV that you will be using in next five years.
(d) UCLA's purchase of five new Bruin Buses.

3. Which of the following activity will raise the US GDP of 2015?
(a) tuition you paid for Spring 2015 quarter.
(b) sale of an unused car that was produced in 2014.
(c) your donation to a charity.
(d) purchase of a laptop produced in Japan.
(e) a and b.
(f) a and d.

4. If an automobile factory has paid $A for parts used in production, $B as wage of the labor, $C for capital it rented and sold the car it produced for $D, then the <u>value added</u> generated from production of this car is $_____.
(a) D.
(b) D-C.
(c) D-B.
(d) D-A.
(e) D-C-A.
(f) D-C-B-A.

5. Which of the following is NOT counted in GDP:
(a) wage and salary income.
(b) purchase of a stock.
(c) rental payments.
(d) profits of a firm.
(e) interest payments.

6. In Solow Growth Model, an economy cannot grow forever simply by capital accumulation. This is due to the following assumption of the Solow Growth Model:
(a) diminishing marginal product of capital.
(b) constant returns to scale.
(c) closed economy.
(d) no government.

7. Consider the Solow Growth Model. Assume that all of the model parameters (A, s, δ and α) are constant. If this country is currently <u>growing very fast</u>, which of the following statement is <u>most likely to be TRUE</u>?
(a) The capital per capita must be at its steady state level.
(b) The capital per capita must be slightly below its steady state level.
(c) The capital per capita must be far below its steady state level.
(b) The capital per capita must be slightly above its steady state level.
(c) The capital per capita must be far above its steady state level.

8. Consider the Solow Growth Model. Assume that a country is initially at its steady state and all of the parameters (A, s, δ and α) of the model remains constant. If this country receives some amount of capital from other countries as foreign aid, then:
(a) Capital per capita will remain the same both in the short run and long run.
(b) Capital per capita will first go up and eventually reach to a new steady state level higher than the original one.
(c) Capital per capita will first go up and eventually come back to its original level.
(d) Capital per capita will first go down and eventually reach to a new steady state level lower than the original one.
(e) Capital per capita will first go down and eventually come back to its original level.

9. Which of the following is a stock variable?

(a) government budget deficit
(b) inflation rate
(c) investment
(d) unemployment rate
(e) GDP

10. TRUE or FALSE?
Solow model is consistent with unconditional convergence, meaning that it predicts that poor countries will converge to rich countries, regardless of their technology and saving rate.
(a) TRUE
(b) FALSE
(c) We don't have enough information to answer.

11. TRUE or FALSE?
An increase in Government spending (G) will reduce private savings, keeping everything other than G constant.
(a) TRUE
(b) FALSE
(c) We don't have enough information to answer.

12. TRUE or FALSE?
Real GDP can be larger than nominal GDP.
(a) TRUE
(b) FALSE
(c) We don't have enough information to answer.

13. Which of the following is counted in GDP?
(a) leisure
(b) purchase of IBM stock
(c) social security checks
(d) pollution
(e) capital stock
(f) illegal activities
(g) sale of inventories
(h) paychecks

14. If life expectancy increases in a country, then in the market for loanable funds, we would expect to see:
(a) shift of saving curve to the right.
(b) shift of investment curve to the left.
(c) shift of saving curve to the left.
(d) increase in interest rate.

15. If government raises the taxes and consumers pay half of this tax by reducing their consumption, then (assume that G and Y does not change):
(a) Private savings will remain unchanged.
(b) National savings will go up.
(c) Public savings will fall.
(d) Interest rate will go up.

16. GDP measures all of the following, EXCEPT for:
(a) output.
(b) income.
(c) expenditures.
(d) standard of living.
(e) economic activity

PART 2: Short Answer Questions (52 pts)

Please show your work explicitly. Be careful in labeling the graphs and indicating shifts/movements.

Question 1 (12 pts)

Given the information below, calculate the total rent income in this economy. You can use capital letter next to the item to show your calculations rather than writing the name of the item. Remember that there can be some items that are not used in GDP calculation.

Item	Value
A. Imports	600
B. Inventory investment	600
C. Residential investment	1,500
D. Expenditure on non-durable goods	1,500
E. Government purchases of goods and services	900
F. Total unemployment insurance benefits	800
G. Spending on services	3,000
H. Fixed Business Investment	1000
I. Total Profits	1,800
J. Exports	900
K. Consumption of durable goods	1,200
L. Total Wage Income	4,000
M. Total Interest Income	3,000
N. Social Security Payments	500

You have to eliminate items F and N (even though you don't show it formally).

Then, you have to calculate GDP from the expenditure side: -A+B+C+D+E+G+H+J+K=10,000.

Then from the income side, GDP is I+L+M+Rent=8,800+Rent=10,000. Rent=1,200.

Question 2 (16 pts)

Consider the Solow growth model (in per capita) with following equations:

$$\boldsymbol{y = Ak^{\alpha}}$$

$$\boldsymbol{y = c + i}$$

$$\boldsymbol{i = sy}$$

$$\boldsymbol{k' - k = \Delta k' = i - \delta k}$$

Here, y is output per capita, k is capital per capita, i is investment per capita and c is consumption per capita. Also, A is level of technology, s is saving rate and δ is the depreciation rate.

(a) Derive an equation for the steady state capital per capita in terms of model parameters A, s, α and δ. You have to show your work step by step. Writing only the equation without showing your work gets 0. (5 points).

k'-k=0 is the starting point.

Then i= δk

Then sAk^{α} = δk

Then, $sA/\delta = k/k^{\alpha}$

Then, $sA/\delta = k^{1-\alpha}$

Then k= $(sA/\delta)^{1/(1-\alpha)}$

b) You are given that A=1, s=0.3, α=0.5 and δ=0.075. Using first the equation you found in part a, and later the relevant model equations, calculate the steady state levels of k, y, i and c. (4 points).

Each of the following is 1 point:
k=4^2=16
y=16^(0.5)=4
i=sy=0.3*4=1.2
c=(1-s)y=y-i=1.8

c) Assume now that A increased to 2.5. Find the new level of steady state capital per capita. (2 points).

k=(2.5*0.3/0.075)^2=10^2=100

(d) On a graph, show the case in part c (increase of A from 1 to 3). Show original steady state, shift(s) of the curve(s) (if any) and the new steady state. Put two numbers on the graph: original and new (the one in part c) steady state levels of capital per capita. You don't have to calculate new steady state levels of y, c and i. (5 points).

Drawing all three original curves (y, i and depreciation) is 1 point.

Shifting y curve is 2 points.

Shifting i curve is 2 points.

Question 3 (10 pts)

Calculate GDP and value added for each producer using the following data:

A dairy farmer sells $250 of milk to a cheese maker. The cheese maker produces cheese from the milk, and sells it to a wholesaler for $450. The wholesaler sells it to a retailer for $700. The retailer sells the cheese for $1300. (2 points each)

Note: You are expected to calculate five values. One GDP, and four value added.

Each of the below is 2 points.
GDP=1,300.
VA of farmer: 250-0=250
VA of cheese maker: 450-250=200
VA of wholesaler: 700-450=250
VA of retailer: 1,300-700=600.

Question 4 (14 pts)

Consider the economy given below:

	2012		2013		2014	
	P	Q	P	Q	P	Q
Apple	2	200	3	240	4	260
Milk	3	300	3	400	4	500
Coffee	4	100	5	120	4	200

(a) Calculate the inflation rate (growth rate of price level) <u>from 2013 to 2014</u> using <u>GDP deflator</u>. <u>Use 2014 as the base year</u>. (7 points).

GDP deflator 2013: (3*240+3*400+5*120)/(4*240+4*400+4*120)=2,520/3,040=0.83
GDP deflator 2014: (4*260+4*500+4*200)/(4*260+4*500+4*200)=3,840/3,840=1.00
Inflation: [(1.00-0.83)/0.83]*100=20.5%

	2012		2013		2014	
	P	Q	P	Q	P	Q
Apple	2	200	3	240	4	260
Milk	3	300	3	400	4	500
Coffee	4	100	5	120	4	200

(b) Calculate the inflation rate (growth rate of price level) <u>from 2013 to 2014</u> using <u>CPI Index</u>. <u>Use 2014 as the base year</u>. (7 points).

CPI for 2013: 3*260+3*500+5*200=3,280
CPI for 2014: 4*260+4*500+4*200=3,840

Inflation: [(3,840-3,280)/3,280]*100=17.1%