Econ 362 Hanes Spring 2024 First midterm
There are 34 multiple choice questions for 1 pt. each, and two written questions. Total points on exam: 44.
Look over the whole test before you begin. Good luck!

1) Which of the following is a Laspeyres price index?
a) Nominal GDP b) Nominal GNP c) GDP price index d) CPI
e) Chained (2012) dollar real GDP index

2) Which of the following is a chained Fisher price index?
a) Nominal GDP b) Nominal GNP c) GDP price index d) CPI
e) Chained (2012) dollar real GDP index

3) The textbook says that a Paasche price index uses "a changing basket of goods." Which of the following is true for a Paasche price index that covers several years (not just two)?
a) It uses quantities from the first year to weight the prices in every year.
b) It uses quantities from the last year to weight the prices in every year.
c) It uses an average of the quantities in the first year and the last year to weight the prices in every year.
d) It uses the first-year quantities to construct one price index, then uses the last-year quantities to construct another price index, and takes a geometric average of those two indexes.
e) None of the above.

4) Which of the following contains exactly the same information as the "real GDP quantity index"?
a) Nominal GDP b) Nominal GNP c) GDP price index d) CPI
e) Chained (2012) dollar real GDP index

5) Which of the following can be (directly) affected by changes in prices of imports?
a) Nominal GDP b) Nominal GNP c) GDP price index d) CPI
e) Chained (2012) dollar real GDP index

6) Which of the following is equal to total "factor incomes" paid out by establishments located in the U.S.?
a) Nominal GDP b) Nominal GNP c) GDP price index d) CPI
e) Chained (2012) dollar real GDP index

7) In this table, what should the last column be?

Year	Real GDP Quantity index	Nominal GDP	Chained (2002) dollar real GDP
2001	0.90	900	_____
2002	1.00	1000	_____
2003	1.10	1050	_____

Year	a)	b)	c)	d)	e) none of those is correct
2001	950	0.90	900	950	
2002	1000	1.00	1000	1000	
2003	1050	1.05	1100	1100	

8) What's bigger, GDP or GNP?
a) GDP is bigger b) GNP is bigger c) They must be equal d) Either one can be bigger - it depends.

9) What's bigger, GDP or NDP (net domestic product)?
a) GDP is bigger b) NDP is bigger c) They must be equal d) Either one can be bigger - it depends.

10) Suppose real GDP is growing at 3 percent a year and the population is shrinking (getting smaller) at the rate of 2 percent a year. Then the rate of growth of real GDP per person is:
a) One percent b) Three percent c) Five percent d) Six percent e) None of the above

The following information is for questions 11) and 12). Suppose the BLS surveys people about their activities and gets the following results.

	Number of people (in millions)
Employed or self-employed	4
Not employed, searching for a job	1
Not employed, not searching for a job	1
Not employed, retired	2

11) What is the unemployment rate as calculated by the BLS?
a) 10% b) 15% c) 20% d) 25% e) None of the above

12) Suppose that some people in the "not employed, not searching for a job" were looking for a job until recently but have given up because no one is hiring in their towns. Which of the following *might* be (isn't necessarily, but *might* be) a possible value of the *true* unemployment rate, that is the rate matching economists' theoretical definition of unemployment?
a) 10% b) 15% c) 20% d) 25% e) None of the above

13) Here is some information about an economy. If the "growth accounting" method is correct, what was the average annual rate of growth in *total factor productivity* from 1995 to 1999? Use the blank space below the question for your calculations.
Share of capital in national income: 1/2
From 1995 to 1999, average annual rate of growth in: Real GDP: 8%
Labor input: 6%
Capital stock: 4%
a) 1% b) 2% c) 3% d) 4% e) None of the above

14) Here is some information about an economy. If the "growth accounting" method is correct, what was the average annual rate of growth in *the capital stock* from 1995 to 1999? Use the blank space below the question for your calculations.
Share of capital in national income: 1/2
From 1995 to 1999, average annual rate of growth in: Real GDP: 8%
Labor input: 6%
Total factor productivity: 4%
a) 1% b) 2% c) 3% d) 4% e) None of the above

15) When a country breaks up into two countries, total real GDP of the two countries is usually about the same as the real GDP of the original country before the break-up. This shows aggregate production functions have which property?
a) Cobb-Douglas form b) Euler's theorem c) Diminishing marginal product d) Constant returns to scale
e) None of the above

16) For which of the following conclusions did we rely on "Euler's Theorem"?
a) The marginal product of capital diminishes as you add more and more capital to an economy, holding labor fixed.
b) Real GDP can be equal to the sum of real income paid to labor and real income paid to owners of capital.
c) GDP is equal to total value-added of establishments in an economy.
d) Construction of a Fisher price index
e) None of the above.

17) In recent years, labor's share of national income has fallen. Which of the following have been proposed by economists as explanations?
I) The aggregate production function has shifted from having constant returns to scale to having increasing returns to scale.
II) Product markets are not perfectly competitive, and they are becoming *less* competitive.
III) Product markets are not perfectly competitive, but they are becoming *more* competitive.
IV) In recent years, technological change has not only increased total factor productivity, but also changed the relative importance of capital and labor in the production process, thereby altering the parameter α .

a) I & II) b) II) and III) c) III) and IV) d) I) and III) e) II) and IV)

The following information is for questions 18)- 24). They are about value-added and GDP. There are four industries in the primitive country of Cimmeria: stick-gathering, stone-gathering, stone-axe making, and deer-hunting. Gatherers of sticks and stones sell them to axe-makers, who use the sticks and stones to make axes. An axe gradually wears out, but each one can be used for many years. Axes are bought by deer-hunting firms, which use axes to club deer to death, then sell the deer meat to households. Deer-hunting firms are owned by residents of a neighboring country, Kafiristan. The other firms are owned by Cimmerians. Cimmerians own no firms in other countries.

Fill out this table, then answer the questions.

	Sales revenue	Labor cost	Purchases of sticks	Purchases of stones	Purchases of axes	Value-added
Stick-gathering	5	4	0	0	0	_____
Stone-gathering	10	5	0	0	0	_____
Axe-making	20	4	5	10	0	_____
Deer Hunting	30	5	0	0	20	_____

Profits of Cimmerian deer-hunting firms: 5

GDP in Cimmeria: _____ GNP in Cimmeria: _____

18) What is value-added in stick-gathering? a) 1 b) 5 c) 10 d) 30 e) None of the above

19) What is value-added in axe-making? a) 1 b) 5 c) 10 d) 30 e) None of the above

20) What is value-added in deer-hunting? a) 1 b) 5 c) 10 d) 30 e) None of the above

21) What is GDP? a) 12 b) 30 c) 45 d) 50 e) None of the above

22) What is GNP? a) 12 b) 30 c) 45 d) 50 e) None of the above

23) Which items' prices would be included in a CPI for Cimmeria?
a) Sticks, stones, axes, deer meat b) Just stones, axes, deer meat c) Just axes, deer meat
d) Just deer meat e) None of the above

24) Which items' prices would be included in a GDP price index for Cimmeria?
a) Sticks, stones, axes, deer meat b) Just stones, axes, deer meat c) Just axes, deer meat
d) Just deer meat e) None of the above

What is the marginal product of *capital* for each of the following aggregate production functions? For each function, choose an answer from the list below. Hint: use calculus to get the marginal product of capital and write that next to the production function. Then choose the answer from the list.

25) $Y = 10 + 3K + 2L$

26) $Y = 3K + 2L$

27) $Y = A + K^{1/2}L^{1/2}$

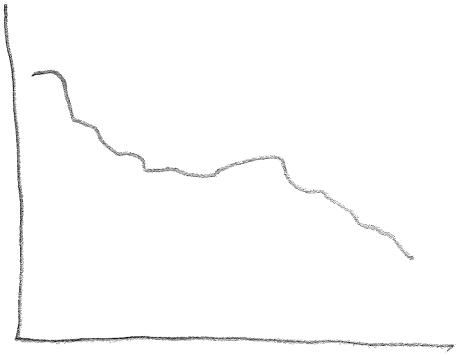
28) $Y = AK^{1/2}L^{1/2}$

List of possible answers:

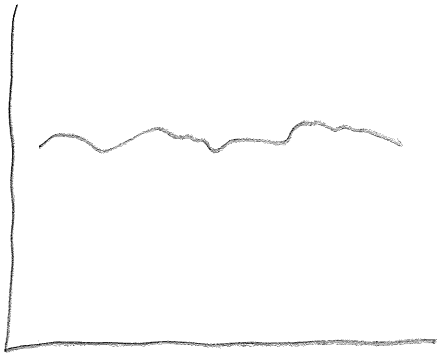
a) $10 + 3$ b) 3 c) $A\frac{1}{2}K^{-1/2}L^{1/2}$ d) $\frac{1}{2}K^{-1/2}L^{1/2}$ e) $K^{1/2}A^{1/2}\frac{1}{2}L^{-1/2}$

29) The graphs below plot labor's share of income over time in four countries. Assuming all markets are perfectly competitive, which country might have an aggregate production function that looks like this: $Y = K^{1/4}L^{3/4}$?

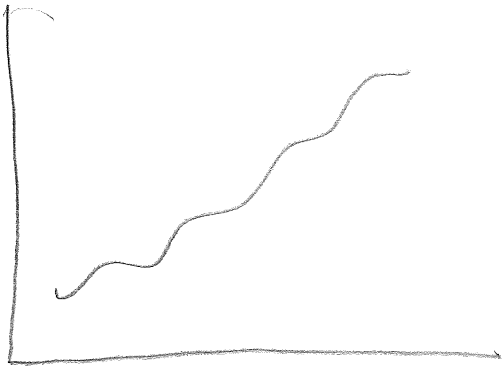
a)



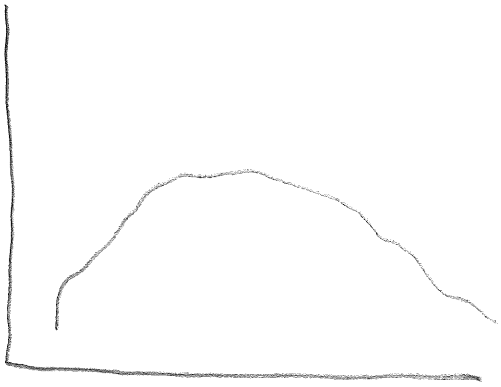
b)



c)



d)



e) None of the above

30) Consider an economy with a production function of the Cobb-Douglas form. What is the natural rate of output $\overline{Y}$ if labor input $\overline{L}$ is measured as the number of workers, and:

the total factor productivity parameter $A = 10$

$\alpha = 1/2$

the labor force is equal to 10 units

the capital stock $\overline{K}$ is equal to 4 units

the natural rate of unemployment $\overline{u}$ is ten percent?

a) 30 b) 40 c) 50 d) 60 e) None of the above

The following information is for questions 31) - 34).
This table describes prices and quantities of two goods, A and B, in two years, 2012 and 2013.

	Good A		Good B	
Year	Price	Quantity	Price	Quantity
2012	P_1^A	Q_1^A	P_1^B	Q_1^B
2013	P_2^A	Q_2^A	P_2^B	Q_2^B

The following formulas give possible answers to the questions below. Look at the questions, then look back up at the formulas and choose your answers.

a) $(P_2^A \times Q_2^A + P_2^B \times Q_2^B) / (P_1^A \times Q_2^A + P_1^B \times Q_2^B)$

b) $(P_2^A \times Q_1^A + P_2^B \times Q_1^B) / (P_1^A \times Q_1^A + P_1^B \times Q_1^B)$

c) $(P_1^A \times Q_2^A + P_1^B \times Q_2^B) / (P_1^A \times Q_1^A + P_1^B \times Q_1^B)$

d) $(P_1^A \times Q_1^A + P_1^B \times Q_1^B) / (P_2^A \times Q_1^A + P_2^B \times Q_1^B)$

e) None of the above

31) What is the formula for the value of a Laspeyres price index number for year 2013, base year 2012=1?

32) What is the formula for the value of a Paasche price index number for year 2013, base year 2012=1?

33) What is the formula for the value of a Laspeyres quantity index number for year 2013, base year 2012=1?

34) What is the formula for the value of a Laspeyres price index number for year 2012, base year 2013=1?

Written questions. No partial credit!

I) 4 pts. Below are three price indexes, *A*, *B* and *C*. In the final column, fill in the values of one price index that links them together. For the linked index, make 1925 the base year, and make the base-year value of the linked index 1.

Year	A	B	C	Link
1925	1			
1926	4	1		
1927		0.5	1	
1928			3	

II) 6 pts. Using the *Z* method, *show* whether each of these production functions does or does not have constant returns to scale. As on the problem set, put the "question mark above the equals sign" until you get to the bottom line. If your answer is "yes, it does have constant returns," make sure that the bottom-line equation is *exactly the same* on the left- and right-hand sides.

A) $Y = 4 + 3KL$ Does it have constant returns to scale? Yes or no? _____

B) $Y = 4K + K^{1/3}L^{2/3}$ Does it have constant returns to scale? Yes or no? _____