Economics 362 Macroeconomic Theory   Name:_____

Hanes Fall 2022 First midterm   TA name:_____

                                            Section number or day/time: _____

There are 34 multiple choice questions for 1 pt. each, and two written questions. Total points on exam: 46. Look over the whole test before you begin. Good luck!

1) How many people are in the "labor force" if six thousand people are employed, two thousand people are unemployed (and actively looking for work), and one thousand people are full-time students?
a) Nine thousand   b) Eight thousand   c) Seven thousand   d) Six thousand   e) None of the above

2) What happens to the statistical unemployment rate if there is no change in the number of people employed, but many people without jobs give up looking for work?
a) Decrease   b) Increase   c) No change   d) Depends on the number of people who are full-time students
e) None of the above

3) For a *Laspeyres* price index, you weight prices by the quantities purchased in the earlier year. For a *Paasche* price index, you weight prices by the quantities purchased in the latest year. Suppose that people tend to buy less of a good if its price has been rising relatively fast. Then which type of price index, Laspeyres or Paasche, will tend to give a lower rate of inflation between the earlier year and the later year?
a) Laspeyres   b) Paasche   c) They will give the same rate of inflation   d) They will give different rates of inflation, but I don't know which one will tend to give a higher rate   e) None of the above

4) Why do we believe that real aggregate production functions, for real countries, have constant returns to scale?
a) We observe that an increase in the quantity of capital *or* labor is associated with an increase in output
b) We observe no correlation between the size of a country and its output (or income) per person
c) We observe a positive correlation between the size of a country and its output (or income) per person
d) We observe a negative correlation between the size of a country and its output (or income) per person
e) None of the above

5) The Japanese own lots of property in the U.S. and also own lots of shares in manufacturing firms that have plants located in China. Based on that information alone, which of the following is likely to be true about Japan?
a) Investment spending (I) is greater than Consumption spending (C).   b) Consumption spending (C) is greater than inverstment spending (I).   c) GNP is more than GDP   d) GNP is less than GDP   e) None of the above

6) Which of the following American statistics best indicates total dollar income of U.S. residents?
a) Nominal GDP   b) Nominal GNP   c) Real GDP index   d) CPI
e) Chained (2012) dollar real GDP estimate

7) Which of the following American statistics represents the total dollar value of final goods and services produced within U.S. borders?
a) Nominal GDP   b) Nominal GNP   c) Real GDP index   d) CPI
e) Chained (2012) dollar real GDP estimate

8) Which of the following American statistics most closely represents total dollar value added by all enterprises located in the U.S.?
a) Nominal GDP   b) Nominal GNP   c) Real GDP index   d) CPI
e) Chained (2012) dollar real GDP estimate

9) Which of the following American statistics best indicates changes in prices paid by your family for the things your parents buy?
a) Nominal GDP   b) Nominal GNP   c) GDP price index   d) CPI
e) Chained (2012) dollar real GDP estimate

10) Which of the following items is covered by the American GDP price index but not by the American CPI?
a) Autos built in Japan   b) Factory equipment built in Indiana   c) Tickets to Disney World in Florida
d) Both a) and b)   e) Both a) and c)

11) Which of the following items is covered by the American CPI but not by the American GDP price index?
a) Autos built in Japan   b) Tractors built in Indiana   c) Tickets to Disney World in Florida
d) Both a) and b)   e) Both a) and c)

12) Which of the following tends to increase American real GDP, but does not necessarily affect the American CPI?
a) An increase in the price of tractors built in Korea
b) An increase in the price of tractors built in Indiana
c) An increase in the quantity of tractors built in Korea
d) An increase in the quantity of tractors built in Indiana
e) None of the above.

The following information is for 13) and 14). Look at the information below to figure out the value of a "chained (2000) dollar real GDP estimate" for the year 2001. Note that the right-hand side column gives the index number, *not* percent changes in the index number.

Year	Nominal GDP, $ billions	Real GDP quantity index (base year 2000).
1999	$180	0.7
2000	$200	1.0
2001	$210	1.2
2002	$211	1.1
2003	$220	1.0

13) What is the value of a "chained (2000) dollar real GDP estimate" for 2003? Notice that the base year for this "chained dollar estimate" is 2000.
a) $200   b) $210   c) $220   d) $230   e) None of the above

14) What is the value of a "chained (2000) dollar real GDP estimate" for 2001? Again notice that the base year for this "chained dollar estimate" is 2000.
a) $200   b) $210   c) $220   d) $230   e) None of the above

The following information is for questions 15) through 17).
Look at the following data on prices and quantities in an economy.

	Ham		Cheese	
Year	Quantity	Price	Quantity	Price
2002	5	10	100	1
2003	4	11	110	2

15) Which of the lines below gives you the formula for a *Laspeyres* price index for 2003,   base year 2002?
16) Which of the lines below gives you the formula for a *Paasche* price index for 2003, base year 2002?
17) Which of the lines below gives you the formula for a *Fisher* price index for 2003, base year 2002?

a) $[(4 \times 11) + (110 \times 2)] / [(5 \times 10) + (100 \times 1)]$

b) $[(4 \times 11) + (110 \times 2)] / [(4 \times 10) + (110 \times 1)]$

c) $[(5 \times 11) + (100 \times 2)] / [5 \times 10) + (100 \times 1)]$

d) $\sqrt{([(4 \times 11) + (110 \times 2)] / [(4 \times 10) + (110 \times 1)]) \times ([(4 \times 11) + (110 \times 2)] / [(5 \times 10) + (100 \times 1)])}$

e) None of the above

The following information is for questions 18) - 23). There are three industries on the primitive island of Istria. All of them hire labor from households (families). Stone-finders find sharp stones and sell them to stone-axe makers. Stone-axe makers make stone axes out of stones (purchased from stone-finders) and wooden sticks (purchased from stick-makers). Stick-makers buy stone axes, cut small branches off trees and make them into sticks. Stone axes are sold not just to stick makers but also to households (to clobber deer, which households eat themselves; households never *sell* deer). Sticks are sold not just to stone-axes makers but also to households (to make fires to cook deer). Istrians have no contact of any kind with the outside world.

Fill out the table, then answer the questions.

	Sales revenue	Cost of labor	Cost of stones	Cost of sticks	Cost of axes	Value-added
Stone-axe makers	10	3	5	2	0	_____
Stick-makers	4	2	0	0	1	_____
Stone-finders	4	2	0	0	0	_____

GDP _____

18) What is value-added for stone-axe makers? a) 1 b) 2 c) 3 d) 4 e) 5

19) What is value-added for stick-makers? a) 1 b) 2 c) 3 d) 4 e) 5

20) What is value-added for stone-finders? a) 1 b) 2 c) 3 d) 4 e) 5

21) What is GDP? a) 6 b) 7 c) 8 d) 9 e) None of the above

22) Which of the following is a complete list of items that would be covered by a GDP price index for Istria?
a) Stones, stone axes, sticks, deer   b) Stones, stone axes, sticks   c) Stone axes, sticks   d) Stone axes
e) None of the above

23) Which of the following is a complete list of items that would be covered by a CPI for Istria?
a) Stones, stone axes, sticks, deer   b) Stones, stone axes, sticks   c) Stone axes, sticks   d) Stone axes
e) None of the above

24) The unique feature of the Cobb-Douglas production function is that it allows:
a) marginal product to be diminishing for both labor and capital
b) the depreciation rate to remain constant
c) returns to scale to be constant
d) the share of national income going to capital and the share of national income going to labor to be constant
e) None of the above

25) What is the geometric average of 2 and 8? a) 2 b) 3 c) 4 d) 5 e) 6

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. Use *calculus* to get the marginal product of capital and write that next to the production function. Then choose the answer from the list. Note: an answer in the list may be correct for more than one production function.

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

27) $Y = 100KL + L^2$

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

29) $Y = LK^{1/3} + 2K$

30) $Y = 100KL$

List of possible answers:

a) $L\frac{1}{3}K^{-2/3} + 2$ b) *100L*   c) *3*   d) $\frac{1}{2}K^{-1/2}$ e) None of the above

31) Here is some information about an economy. Using the information, calculate the average annual rate of growth in "total factor productivity" from the year 1995 to 1999.
Share of capital in national income: 1/3
From 1995 to 1999, average annual rate of growth in: Real GDP: 8%
                                                         Labor input: 9%
                                                         Capital: 3%

a) -2%   b) -1%   c) 1%   d) 2%   e) None of the above

32) Economists have recently begun to consider the possibility that product markets have become less competitive in recent years. What economic development, apparent in statistics, has caused them to consider this possibility?
a) The rate of growth in total factor productivity ("A" in the aggregate production function) has slowed down.
b) The ratio of capital to labor input has risen.
c) Labor's share of national income has fallen.
d) The inflation rate in the CPI has been greater than the inflation rate in the PCE price index.
e) None of the above.

33) This is about the "marginal propensity to consume." Suppose that disposable income increases from 10 to 14, while consumption spending increases from 7 to 10. What is the "marginal propensity to consume" in the economy?
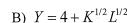a) 2   b) 3   c) 3/4   d) 1/2   e) None of the above

34) What is the natural rate of output (or "potential output") $\overline{Y}$ if the aggregate production function is $Y = K^{1/2}L^{1/2}$, the capital stock $\overline{K}$ is equal to 16, the natural rate of unemployment $\overline{u}$ is 10 percent, and the labor force $\overline{L}$ is equal to 10?
a) 16   b) 12   c) 8   d) 6   e) None of the above

Written questions

I) 6 pts. For each aggregate production function below, use the *z* method to test whether the function has constant returns to scale. *I want to see the algebra!* Then go back to the top and state whether it *does* or *does not* have constant returns to scale.

A) $Y = 20K^{1/2}L^{2/3}$ Does it have constant returns to scale? Yes or no? _____

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

II) 6 pts. Recall that the "chain-weighted real GDP index" is a Fisher index of quantities weighted by prices. Here is a table with prices and quantities in an economy. Construct a Laspeyres quantity index, a Paasche quantity index, and a Fisher quantity index. Fill in the blank columns. **Show your work in the spaces below.** I must see how you got your answers.

	Hats		Shirts		Quantity indexes, base year 1914 (base year = 1)		
Year	Quantity	Price	Quantity	Price	Laspeyres	Paasche	Fisher
1914	8	1	2	1	_____	_____	_____
1915	2	0	8	2	_____	_____	_____

Calculations for column labeled "Laspeyres"

Calculations for column labelled "Paasche"

Calculations for column labeled "Fisher"