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EXAMINATION 2 VERSION A
"Measuring the Economy"
October 7, 2024

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards are NOT permitted. Cell phones or other wireless devices are NOT permitted. Point values for each question are noted in brackets. Points will be subtracted for illegible writing or incorrect rounding. Maximum total points are 100.

I. Multiple choice: Circle the one best answer to each question. Please use the margins for scratch work.
[1 pt each, 15 pts total]

(1) Over time, a graph of real GDP shows
a. long-run growth.
b. short-run fluctuations.
c. both (a) and (b).
d. neither (a) nor (b).

(2) Potential GDP does *not* depend on
a. the total money supply.
b. total hours of all workers
c. total economic capital available.
d. technology or know-how available.

(3) At the peak of a business cycle, actual GDP is
a. above potential GDP.
b. below potential GDP.
c. equal to potential GDP.
d. cannot be determined from information given.

(4) The highest unemployment rate in the U.S. over the last 100 years occurred during the
a. COVID recession of 2020.
b. Great Recession of 2007-2009.
c. back-to-back recessions of the early 1980s.
d. Great Depression of the 1930s.

(5) In the early 1980s, the inflation rate in the U.S. decreased from about 10 percent to about 4 percent per year. This is an example of
a. deflation.
b. reflation.
c. hyperinflation.
d. disinflation.

(6) Suppose the interest rate on loans is 5 percent and the inflation rate is expected to be 2 percent. Then the real rate of interest is
a. negative 2 percent.
b. 2 percent.
c. 3 percent.
d. 5 percent.
e. 7 percent.
f. 10 percent.

(7) Interest rates and the money supply are elements of
a. monetary policy.
b. international trade policy.
c. fiscal policy.
d. foreign policy.

(8) Of the following spending components of GDP, which is usually the largest in the U.S.?
a. Consumption.
b. Investment.
c. Government purchases.
d. Net exports.

(9) Consumption spending in the national accounts does *not* include
a. spending on cell phone service.
b. spending on entertainment.
c. purchases of necessities like food and clothing.
d. spending on medical care.
e. purchases of new homes.

(10) Investment spending in the national accounts does *not* include purchases of
a. trucks and heavy equipment.
b. new factories.
c. land.
d. new homes.
e. business software.

(11) Government purchases in the national accounts do *not* include
a. spending on military aircraft.
b. spending for environmental preservation.
c. spending on highway construction.
d. welfare payments to low-income families.
e. salaries of members of Congress.

(12) If a country's investment spending exceeds its national savings, then also its
a. government spending exceeds its tax revenues.
b. imports exceed its exports.
c. consumption exceeds its income.
d. unemployed workers exceed job vacancies.

(13) Real GDP is defined as GDP
a. divided by population.
b. adjusted for changes in life expectancy.
c. adjusted for inflation.
d. adjusted for statistical errors.

(14) Over the last 50 years, the price level has risen
a. never.
b. rarely.
c. in about half the years.
d. almost every year.

(15) The exchange rate was 46 Indian rupees per U.S. dollar in 2010, and 53 rupees per U.S. dollar in 2012. Clearly, the
a. dollar appreciated against the rupee.
b. rupee depreciated against the dollar.
c. both of the above.
d. none of the above.

II. Problems: Insert your answer to each question in the box provided. Please use the margins and graphs for scratch work. Only the answers in the boxes will be graded. Work carefully—partial credit is not normally given for questions in this section.

(1) [Spending approach to GDP: 16 pts] Consider each of the following items purchased in 2024. Should the item be counted as part of U.S. GDP for 2024—*YES* or *NO*? If *YES*, in which spending component of GDP—consumption (C), investment (I), government purchases (G), or net exports (X)—does it belong? If *NO*, explain why not.

	Part of U.S. GDP for 2024? (YES or NO)	*If YES, then which spending component (C, I, G, or X)? If NO, why not?*
a. A painting by Andrew Wyeth (1917-2009) purchased by a collector.		
b. A new windmill purchased by an electric power company.		
c. A new home computer purchased by a family in West Des Moines.		
d. A new Boeing jet purchased by an Asian airline.		

(2) [Components of GDP: 16 pts] The imaginary country of Concrete Land has just four industries: the Raw Concrete Industry, the Building Construction Industry, the Road Construction Industry, and the Birdbath Industry. There are no other goods and no foreign trade. In a recent year:

- The Raw Concrete Industry produced and sold $2 trillion to the Birdbath Industry, $0.5 trillion to the Road Construction Industry, and $0.5 trillion of raw concrete to the Building Industry, for a total of $3 trillion in sales.
- The Birdbath Industry produced and sold $8 trillion of birdbaths to consumers.
- The Road Construction Industry produced $1 trillion of roads for the government.
- The Building Industry produced and sold $1 trillion of buildings (a capital good) to each industry (including itself) for a total of $4 trillion in sales.

a. Compute the spending components of Concrete Land's GDP.

Consumption (C)	$ trillion
Investment (I)	$ trillion
Government purchases (G)	$ trillion
Total GDP (Y)	$ trillion

b. Compute value added by each industry in Concrete Land.

Raw Concrete Industry	$ trillion
Building Industry	$ trillion
Road Construction Industry	$ trillion
Birdbath Industry	$ trillion

(3) [GDP, saving, GDP per capita: 6 pts] The table below shows data for the United States as reported by the Bureau of Economic Analysis in *trillions*. [Hint: Some of the data are extraneous and not needed for solving this problem.]

	2019
Transfers	$3.1
Government purchases	$3.8
Consumption	$14.4
Population *in millions*	330
Investment	$3.9
Personal taxes	$2.2
Net exports	-$0.6

a. Compute GDP.

$ trillion

b. Compute national saving (S).

$ trillion

c. Compute GDP per capita to the nearest dollar.

$

(4) [Spending approach to GDP: 12 pts] The table below shows data for the United States as reported by the Bureau of Economic Analysis in trillions for a recent year. [Hint: Some of the data are extraneous and not needed for solving this problem.]

	2021
Personal interest income	$1.5
Change in inventories	$0.1
Exports	$2.6
State and local purchases	$2.6
Compensation of employees	$12.5
Transfer payments	$4.0
Consumption of services	$10.5
Business fixed investment	$3.1
Residential investment	$1.1
Consumption of durable goods	$2.0
Corporate profits	$2.9
Consumption of nondurable goods	$3.5
Personal dividend income	$1.7
Imports	$3.4
National defense purchases	$0.9
Federal nondefense purchases	$0.7
Depreciation (capital consumption of domestic business)	$2.5

a. Compute consumption (C).

$ _____ trillion

b. Compute gross investment (I).

$ _____ trillion

c. Compute net investment.

$ _____ trillion

d. Compute government purchases (G).

$ _____ trillion

e. Does the U.S. have a trade surplus or a trade deficit ?

_____

f. Compute net exports (X).

$ _____ trillion

(5) [Stocks v. flows: 8 pts] Are the following quantities stocks or flows? Write "STOCK" or "FLOW" in each box.

a. The number of students enrolled at Drake University on February 1, 2023.

_____

b. The number of students who graduated from Drake University in 2023.

_____

c. The amount of investment spending in the U.S. in 2023.

_____

d. The amount of economic capital in the U.S. on January 1, 2024.

_____

(6) [Value added: 2 pts] Suppose a custom bicycle shop assembles and sells $500,000 of bicycles in a year. Over the same year, it pays its employees $200,000, it leases the storefront for $30,000, and it purchases $100,000 in parts. Compute the value added by the bicycle shop.

$ _____

(7) [GDP and real GDP: 8 pts] In an imaginary country, only two final goods are produced, as shown in the following table. (You can use the boxes at right for scratch work.)

	Food		Clothing			
Year	Price	Quantity	Price	Quantity	2022 prices	2023 prices
2022	$2	25	$5	10		
2023	$2	31	$7	10		

a. Compute the growth rate of *nominal GDP* (also called "current-dollar GDP") from 2022 to 2023. _____ %

b. Compute the growth rate of GDP from 2022 to 2023 *in constant 2022 prices*. _____ %

c. Compute the growth rate of GDP from 2022 to 2023 *in constant 2023 prices*. _____ %

d. Compute the growth rate of *real GDP* from 2022 to 2023, as it would be computed by the U.S. Bureau of Economic Analysis. _____ %

(8) [Nominal GDP, real GDP, and inflation: 7 pts] The following table shows data for Brazil, in billions of *reais* the Brazilian currency.

Year	Nominal GDP	Real GDP	GDP price index or price deflator (to the nearest tenth)	Rate of inflation (to the nearest tenth of a percentage point)
1995	706	706		
1996	855	722		%
1997	952	746		%

a. [2 pts] Which is the base year for real GDP?

b. [3 pts] Compute the GDP price index for each year, to the nearest tenth, and insert it in the table above. [Hint: The price index should equal 100.0 in the base year.]

c. [2 pts] Compute the rate of inflation for the last two years, to the nearest tenth of a percentage point, and insert in in the table above.

(9) [Using the CPI: 2 pts] Apple Computer Company introduced the Apple II desktop computer (with 4KB of RAM) in 1977 at a price of $1,298. In that year, the CPI was about 61. The CPI is now about 314. Compute the 1977 price of the Apple II in today's dollars, to the nearest whole dollar.

$ _____

(10) [Using market exchange rate: 2 pts] The exchange rate for euros is about 0.902 euros per U.S. dollar. Then a fine wine that costs 50 euros will cost how much in U.S. dollars, to the nearest whole dollar?

$ _____

(11) [PPP exchange rate: 2 pts] Suppose a basket of goods bought by a typical consumer that costs 1000 yuan in China would cost 80 US dollars in the United States. What is the purchasing-power-parity exchange rate to the nearest tenth?

_____ Chinese yuan per US dollar

III. Critical thinking: Write a one-paragraph essay answering *one* question below (your choice). [4 pts]

(1) Suppose the value of final goods and services produced annually in Country X is identical to that in Country Y: $2 trillion. However, in Country X, most people have graduated from high school, while in Country Y, most people have only a primary-school education. On the other hand, due to poor health care, Country X has a life expectancy of only 55 years, while Country Y has a life expectancy of 75 years. Which country has higher GDP? Justify your answer.

(2) In the late nineteenth century real GDP grew faster in the U.S. than nominal GDP. Now nominal GDP usually grows faster than real GDP. What must have happened in the late nineteenth century to cause this phenomenon? Justify your answer.

Circle the question you are answering. Write your answer below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling.

[end of exam]