Exercise 6: Macroeconomic Indicators

Problem 1 (*Gross Domestic Product*)

Consider an archipelago consisting of two islands (economies), *Robinson Island* and *Friday Island*. Robinson is the only inhabitant of the former, while Friday is the only inhabitant of the latter. Within one year, the following economic activity takes place on the islands.

- Robinson catches 1,000 kg of fresh fish worth £1 per kg using a harpoon which he rents from Friday for £200 per year. Friday has crafted the harpoon in the previous year. Robinson eats 300 kg of the fresh fish himself and sells another 300 kg to Friday who then eats it. Robinson processes the remaining 400 kg of fresh fish into 200 kg of dried fish worth £2 per kg. He stores the dried fish in order to sell it to Friday in the next year.
- Friday collects 1,000 kg of coconuts worth £1 per kg from his palm plantation, which he has planted some years ago. The plantation has an imputed rental value of £500 per year. Friday eats 300 kg of the coconuts himself and sells another 300 kg to Robinson who then eats them. Friday plants another 200 kg of the coconuts in order to grow additional palm trees which shall carry coconuts in future years. Friday processes the remaining 200 kg of the coconuts into 20 liters of coconut oil worth £20 per liter. He does so by using an old oil mill which he rents from Robinson for £100 per year. Friday stores the coconut oil in order to sell it to Robinson in the next year.

Calculate the GDP of the respective year for both islands (economies) and decompose it according to the

(i) output method,

(ii) income method,

(iii) expenditure method.

Problems 2-4 (*Price Level*)

Consider a closed economy which produces only three goods; beef, pork, and potatoes. In each period, the entire output is consumed.

Base Period: 2020

	Output of beef (in kg)	Price of beef (per kg)	Output of pork (in kg)	Price of pork (per kg)	Output of potatoes (in kg)	Price of potatoes (per kg)
2020	5,000	30	15,000	16	80,000	2
2021	5,000	45	15,000	17.5	80,000	2.5
2022	300	120	20,000	20	83,000	2.5

Problem 2

In 2021, the

(A) GDP-Deflator is 0.75.

(B) GDP-Deflator is 1.25.

(C) CPI is 1.3.

(D) CPI is 2.0.

Problem 3

In 2022, the

(A) GDP-Deflator is 0.75.

(B) GDP-Deflator is 1.25.

(C) CPI is 1.3.

(D) CPI is 2.0.

Problem 4

Between 2021 and 2022, the inflation rate based on the

(A) GDP-Deflator is -0.02.

(B) GDP-Deflator is 0.04.

(C) CPI is 0.

(D) CPI is 0.06.

Problems 5-6 (*Unemployment*)

Consider an economy with an adult population of $N = 70$ million people, of which $U = 2.1$ million are unemployed.

Problem 5

If the labor force participation rate is $e = 0.5$, the number of employed people is

(A) $E = 32.9$ million.

(B) $E = 33.4$ million.

(C) $E = 33.9$ million.

(D) $E = 34.4$ million.

Problem 6

If the unemployment rate is $u = 0.05$, the labor force participation rate is

(A) $e = 0.4$.

(B) $e = 0.5$.

(C) $e = 0.6$.

(D) $e = 0.7$.