**ECON 311 - Intermediate Macroeconomics (Professor Gordon)**

**First Midterm Examination: Winter 2022**

**Solutions**

**Midterm multiple choice solutions**

Question 1. If nominal GDP and real GDP both rise by 10 percent, then the GDP deflator

1. also rises by 10 percent.
2. rises by about 20 percent.
3. falls by 10 percent.
4. is unchanged.

Answer: d

Question 2. Total labor income equals the real wage times the amount of labor hired: $\frac{W}{P}×L=\frac{WL}{P}$. Labor’s share of income is $\frac{WL}{P}$ divided by output *Y*:

$$\frac{\frac{WL}{P}}{Y}=\frac{WL}{PY}$$

Suppose that labor’s share of total income is approximately constant over time.

If labor's share of income is approximately constant, the real wage

1. systematically diverges from labor productivity.
2. closely tracks labor productivity.
3. is inversely related to labor productivity.
4. is unrelated to labor productivity.

Answer: b

Question 3. To increase tax revenue, the U.S. government imposed a 2-cent tax on checks written on bank account deposits in 1932 (in today's dollars, about 34 cents per check). Under this check tax, the money supply would have

1. decreased, because the currency-deposit ratio increased, which in turn decreases the money multiplier.
2. increased, because the currency-deposit ratio increased, which in turn decreases the money multiplier.
3. decreased, because the currency-deposit ratio increased, which in turn increases the money multiplier.
4. increased, because the currency-deposit ratio increased, which in turn increases the money multiplier.
5. not changed, because the check tax would not impact the money supply or the money multiplier.

Answer: a

Question 4. What are the three functions of money?

1. A store of value, a medium of exchange, a unit of account
2. A store of value, a bank reserve holding, a medium of exchange
3. A medium of exchange, a unit of account, a demand deposit
4. A medium of exchange, a demand deposit, a bank reserve holding

Answer: a

Question 5. An economy has a monetary base of $1,000. What is the money supply if all money is held as currency?

1. $1,000
2. $1,200
3. $1,600
4. $2,000

Answer: a

Question 6. An economy has a monetary base of $1,000. What is the money supply if all money is held as demand deposits and banks hold 100 percent of deposits as reserves?

1. $1,000
2. $1,600
3. $2,000
4. $4,000

Answer: a

Question 7. An economy has a monetary base of $1,000. What is the money supply if all money is held as demand deposits and banks hold 25 percent of deposits as reserves?

1. $1,200
2. $1,600
3. $3,000
4. $4,000

Answer: d

Question 8. An economy has a monetary base of $1,000. What is the money supply if people hold equal amounts of currency and demand deposits and banks hold 25 percent of deposits as reserves?

1. $1,000
2. $1,600
3. $3,000
4. $4,000

Answer: b

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| Question 9. The economic statistic used to measure the level of prices is:

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|   | a.  | GDP. |
|   | b.  | CPI. |
|   | c.  | GNP. |
|   | d.  | real GDP. |

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| ANSWER:   | B |

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| Question 10. Two equivalent ways to view GDP are as the:

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|   | a.  | total payments made to all workers in the economy or the total profits of all firms and businesses in the economy. |
|   | b.  | total expenditures on all goods produced in the economy or the total income earned from producing all services in the economy. |
|   | c.  | total profits of all firms and businesses in the economy or the total consumption of goods and services by all households in the economy. |
|   | d.  | total income of everyone in the economy or the total expenditure on the economy's output of goods and services. |

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| ANSWER:   | D |

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| Question 11. Assume that total output consists of 4 apples and 6 oranges and that apples cost $1 each and oranges cost $0.50 each. In this case, the value of GDP is:

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|   | a.  | 10 pieces of fruit. |
|   | b.  | $7. |
|   | c.  | $8. |
|   | d.  | $10. |

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| ANSWER:   | B |

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| Question 12. In the long run, the level of national income in an economy is determined by its:

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|   | a.  | factors of production and production function. |
|   | b.  | real and nominal interest rate. |
|   | c.  | government budget surplus or deficit. |
|   | d.  | rate of economic and accounting profit. |

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| ANSWER:   | A |

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| Question 13. The real wage is the return to labor measured in:

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|   | a.  | dollars. |
|   | b.  | units of output. |
|   | c.  | units of labor. |
|   | d.  | units of capital. |

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| ANSWER:   | B |

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| Question 14. The real wage will increase if:

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|   | a.  | the supply of labor increases. |
|   | b.  | the productivity of labor increases. |
|   | c.  | the price of output increases. |
|   | d.  | the supply of capital decreases. |

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| ANSWER*:* | B |

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| Question 15. In a Cobb–Douglas production function, the marginal product of capital will increase if:

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|   | a.  | the quantity of labor increases. |
|   | b.  | the quantity of capital increases. |
|   | c.  | labor's share of output increases. |
|   | d.  | average capital productivity decreases. |

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| *ANSWER:* | A |

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| Question 16. Bank reserves equal:

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|   | a.  | gold kept in bank vaults. |
|   | b.  | gold kept at the central bank. |
|   | c.  | currency plus demand deposits. |
|   | d.  | deposits that banks have received but have not lent out. |

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| *ANSWER:* | D |

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| Question 17. In a fractional-reserve banking system, banks create money when they:

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|   | a.  | accept deposits. |
|   | b.  | make loans. |
|   | c.  | hold reserves. |
|   | d.  | exchange currency for deposits. |

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| *ANSWER:* | B |

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| Question 18. To increase the monetary base, the Fed can:

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|   | a.  | conduct open-market purchases. |
|   | b.  | conduct open-market sales. |
|   | c.  | raise the interest rate paid on reserves. |
|   | d.  | lower the required reserve ratio. |

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| *ANSWER:* | A |

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| Question 19. If the nominal interest rate increases, then:

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|   | a.  | the money supply increases. |
|   | b.  | the money supply decreases. |
|   | c.  | the demand for money increases. |
|   | d.  | the demand for money decreases. |

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| *ANSWER:* | D |

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| Question 20. Given that *M* / *P* = *kY*, when the demand for money parameter, *k*, is large, the velocity of money is \_\_\_\_\_\_, and money is changing hands \_\_\_\_\_\_.

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|   | a.  | large; frequently |
|   | b.  | large; infrequently |
|   | c.  | small; frequently |
|   | d.  | small; infrequently |

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| *ANSWER:* | D |

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| Question 21. In the long run, according to the quantity theory of money and classical macroeconomic theory, if velocity is constant, then \_\_\_\_\_\_ determines real GDP and \_\_\_\_\_\_ determines nominal GDP.

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|   | a.  | the productive capability of the economy; the money supply |
|   | b.  | the money supply; the productive capability of the economy |
|   | c.  | velocity; the money supply |
|   | d.  | the money supply; velocity |

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| *ANSWER:* | A |

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| Question 22. Assume that a firm is considering building a factory that will cost $5 million. It believes that it can get a profit from this factory of $600,000 per year for many years. The interest rate at which the firm can borrow money is 15 percent. After evaluating whether it should build the factory, the firm decides that it should:

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|   | a.  | not build because the rate of return on the factory is only 6 percent. |
|   | b.  | not build because the rate of return on the factory is only 12 percent. |
|   | c.  | build because the rate of return on the factory is 30 percent. |
|   | d.  | build because the rate of return on the factory is 35 percent. |

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| *ANSWER:* | B |

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| Question 23. Government transfer payments:

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|   | a.  | are included as part of government purchases, *G*. |
|   | b.  | can be viewed as negative tax payments, *T*. |
|   | c.  | are received as payment for inputs in the factor market. |
|   | d.  | do not affect the level of public or private saving. |

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| *ANSWER:* | B |

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**Midterm open questions**

**Question 1 (10 points)**

Please consider each question separately. Make sure that you answer using the log formula, round your answer to two decimal points and include the unit!

1. By the end of 2019, Mexico had a $1.3 trillion nominal GDP. In 2018, its nominal GDP was $1.2 trillion. What was the annual growth rate of Mexico’s nominal GDP between 2018 and 2019? (2 points)

**+ 8.0043%**
2. If measured in 2018 prices, Mexico’s 2019 GDP would be $1.23 trillion. What was Mexico’s GDP Deflator in 2019, using 2018 as base-year? (2 points)

**105.6911**
3. What will real GDP (2018 as base-year) be in Mexico in 2070 if we assume that it will grow at an annual rate of 3% between the end of 2019 and the end of 2070? (2 points)

**$5.6804 trillion**

1. In 2016:Q1 Mexico’s nominal GDP was $1.05 trillion. Calculate the annual growth rate of nominal GDP between 2016:Q1 and 2019:Q4 ($1.3 trillion) (2 points)

**5.6953%**
2. If nominal GDP in 2019 was around $0.3 trillion in Chile, how long will it take for Chile to catch up with Mexico if the annual growth rates of nominal GDP are 2.5% for Mexico and 6% for Chile? (2 points)

**41.8953**

**Question 2 (10 points)**

A small island has the production function Y = K0.25L0.75, where K is the amount of land and L is the amount of labor. The island beings with 81 units of land and 256 units of labor.

HINT: To get a number raised to a fractional exponent, look for the **[xy]** or **[x^y]** button in your calculator. For example, to get 6250.25, you would write down **[625] [xy] [0.25] [=]**, which gives you the result (6250.25 = 5).

1. How much output does the economy produce? (2 points)

**Y = (810.25)(2560.75) = 3 \* 64 = 192**
2. What is the wage in this economy? (2 points)

**w = 0.75 (81 / 256)0.25 = 0.75\*(3/4) = 0.5625**
3. Suppose a storm kills 93.75% of the units of labor. Calculate the new output. (2 points)

**Y = (810.25)(160.75) = 3\*8 = 24**
4. What is the new wage in the island? (2 points)

**w = 0.75 (81/16)0.25 = 0.75 \* (3/2) = 1.125**
5. In what situation is the share / percentage of total output received by the workers greater? Provide a simple explanation (may be theoretical or may be algebraic). (2 points)

**They earn the same share of output in both situations. With a Cobb Douglas function, share of output is constant. Alternatively, wL in b) is 144 (75% of Y = 192) and wL in d) is 18 (75% of 24).**

**Question 3 (10 points)**

An economy has the following money demand function: $\left(M/P\right)^{d}=0.25Y/√i$.

1. Derive an expression for the velocity of money and calculate the velocity if the nominal interest rate is 9%. (2 points)

**M/P = Y/V =>** $V=4√i$

**V = 4 \* 3 = 12**

1. If output Y is 1,500 units and the money supply is $2,000, what is the price level P? (2 points)

**(2000/P) = (0.25 \* 1500) / √9 => P = (2000 \* 3) / (375) = 16**
2. Suppose that an unexpected congestion in the Panama Canal delays supply chains in this economy, increasing expected inflation by 7 percentage points. According to the Fisher effect, what is the new nominal interest rate? Calculate the new velocity of money. (2 points)

**Fisher effect => Nominal interest rate increases 7 percentage points too, new rate: 16%

V = 4 √16 = 16**
3. If the economy’s output and the current money supply did not change after the Panama Canal event, what is the new price level? (2 points)

**P = (2000 \* 4) / (0.25 \* 1500) = 8000 / 375 = 21.333**
4. If the central bank wants to keep the price level the same as in part b) after the Panama Canal event, at what level should the money supply be set? (2 points)

**M / 16 = 375 / √16. => M = 1500**