Definitions
1- Who is counted as unemployed? How is defined the unemployment rate? What about the employment rate?
2- What is inflation? Disinflation? Deflation?
3- What is the Gross Domestic Product?

Identities
1- Thoroughly explain what the sources and uses of products identity is.
2- Using identities, define GDP is two different ways.
3- What is the GNP? Give an identity that defines GNP.
4- What is the identity that defines national income? How are GDP and National Income related?
5- What is disposable income?
6- What can people do with their disposable income?
7- Say that $P_mQ = 9$, $J = 5.5$, $IC = 2$, $FC = 7$, $I_T = 2$, $\Delta$inventories = -1.5, $X = 5$.
   a. Calculate GDP in two different ways.
   b. What is the value of the trade balance (net exports)?
   c. Say that private domestic consumption and public (i.e. government) investment have the following respective value: $C = 3$, $I_G = 0.5$. Calculate each component of the expenditure approach to GDP. Calculate GDP in a third way (you should find the same value as in a.).
8- Now that you know the preceding, say that the total compensation of workers ($W$), the gross profit of firm ($\Pi$), and net interest payment ($iL$) are the only incomes existing in the economy. Let us assume also that:
   - The economy does not earn any income abroad and does not pay income to the rest of the world (so that GNP = GDP).
   - The only discrepancy between GDP and National income (NI) is due to indirect taxes ($T_{ind}$), which are reduced to taxes on domestic products: no taxes on imports.
   - Knowing that total taxes ($T$) are equal to indirect taxes ($T_{ind}$) plus direct taxes ($T_d$), we assume that workers pay an income tax on $W$ at a tax rate of $t_w$ ($t_{II} = 0\%$, $t_{iL} = 0\%$).
   - There are net transfers given to household for a value of $T_r = 1.5$.
   - $NI = 6$, $\Pi = 1$, $iL = 1$, $t_w = 20\%$.
   a. What is the value of $W$?
   b. What is the value of indirect taxes? What is then the value of domestic production before taxes on products and imports ($PQ$)? Calculate GDP in a fourth way by using $PQ$.
   c. What is the value of $T_d$? What is the value of $T$?
d. Excluding transfers, does the government generate a surplus or a deficit? By how much? What if net transfers are included in the calculation?

e. What is the value of disposable income for workers? (be careful: W already excludes indirect taxes)

f. What is then the value of saving by workers (S)?

g. Starting with \( W_D \) calculate NI. Then calculate GDP in a sixth way by starting with \( W_D \).

-Neoclassical Model

1- What are the 5 basic assumptions of the Neoclassical model?

2- Draw the labor market with all the relevant information?

3- How is each curve obtained?

4- On the labor market, draw the impact of:
   a. An increase in \( MC_L \) from \( MC_{L0} \) to \( MC_{L1} \). Explain your result.
   b. A decrease in \( MP_L \) from \( MP_{L0} \) to \( MP_{L1} \). Explain your result.
   c. The imposition of a minimum wage with \( (w/p)_{\text{min}} > (w/p)^* \). Explain your result.

5- Draw the market in which \( r, S, \) and \( I \) are determined (leave aside the government). Include all the relevant information.

6- In the market of question 5, draw the impact of:
   a. An increase in the impatience of savers reflected in an increase of \( \theta \) from \( \theta_0 \) to \( \theta_1 \). Explain your result.
   b. An increase in the marginal output obtained by adding capital equipment from \( MP_{K0} \) to \( MP_{K1} \). Explain your result.
   c. Government spending financed by monetary creation. Explain.
   d. Government spending financed totally by taxes. Explain.
   e. Government spending financed by borrowing some of the private saving. Explain.

7- What is the quantity theory of money? How is it different from the identity \( MV = PQ \)?

8- Say that \( M = 100 \) and \( PQ = 500 \).
   a. Calculate \( V \). Explain.
   b. Knowing that \( Q^* = 50 \), calculate \( P \).
   c. Say that \( M \) is doubled, what is the impact on \( P \)? Explain the mechanism through which \( \Delta M \Rightarrow \Delta P \)
   d. Say that \( V \) is doubled with \( M = 100 \), what is the impact on \( P \)? Explain.

9- Draw a graph that explains how production is determined.

10- What is Say’s law? Why does this law apply?
**Keynes: Identity between Saving and Investment**

1- Define saving. Can you save if you do not have any income?

2- Let us assume that an economy was just created in which there are no taxes, no transfers, and no government expenditures. In addition, we are in a closed economy. Let us assume that firms want to produce goods and services and pay workers a wage. \( W = 100, C = 0, \) and \( I = 0. \) In addition:
   
   a. Knowing that profit is equal to \( \Pi = \text{sales} - \text{cost} \) and that the only cost is labor cost, calculate aggregate profit.
   
   b. What is the value of income \( (Y) \) from the income approach? From the expenditure approach?
   
   c. Knowing that enterprises retain all their profits (they do not pay taxes, interest, or dividends), what is the value of aggregate saving?

3- Let us assume that \( W = 100, C = 90, \) and \( I = 0. \)
   
   a. Calculate aggregate profit.
   
   b. What is the value of income \( (Y) \) from the income approach? From the expenditure approach?
   
   c. What is the value of aggregate saving?

4- Let us assume that \( W = 100, C = 100 \) and \( I = 100 \)
   
   a. Calculate aggregate profit
   
   b. What is the value of income \( (Y) \) from the income approach? From the expenditure approach?
   
   c. What is the value of aggregate saving?

5- What can you conclude from all these examples: can actual investment ever be different from actual saving?

6- In the accumulation process, what does saving represent? What does investment represent?

7- Write the identity between saving and investment in an economy with a government surplus, a government deficit.

8- What is the meaning of “bilateral character of the transactions between producers […] and […] the consumers or the purchasers of capital equipment” (Keynes 1936, 63)?

9- Do you need an adjustment process to equalize actual saving and actual investment? Why? Why not?

10- Why can you still talk about difference between saving and investment?

**Keynes’s involuntary unemployment and effective demand**

1- What is the purpose of Keynes’s *General Theory*?

2- What is involuntary unemployment?

3- Explain how \( N \) is determined by using the \( Z, D \) diagram. How is this different from the Neoclassical analysis?

4- What is the point of effective demand?
5- What is the main cause of (involuntary) unemployment in Keynes? How does this compare with the Neoclassical model?

6- Explains Say’s Law in terms of the Z, D diagram. In this case, why will N go to full employment and not stop before full employment?

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The Simple Keynesian Model

1- What is the purpose this model?

2- What are the two possible uses of disposable income? Define the MPC and the MPS.

3- What is the relation between the MPC and the MPS? What does it mean?

4- Mathematically write the consumption function and the saving function. Define each element of the functions. What is the slope of the consumption function? What is the intercept of the consumption function? What is the slope of the saving function? What is the intercept of the saving function?

5- Graphically represent each function in the E, Y diagram.

6- Given: \( C = 200 + .8Y_D, I = 200, T = 100, G = 0. \)
   a) Draw the graph of the consumption function and of aggregate expenditure in the same graph.
   b) Value of the multiplier =
   c) Value of autonomous expenditure =
   d) \( Y^* = \)
   e) \( C^* = \) (be careful that \( Y^* \) is different from \( Y_D^* \))
   f) \( S^* = \)
   g) Say that \( \Delta I = +100 \), how does \( Y^* \) change? What if \( \Delta T = -10 \)?

7- Explain how the simple multiplier works: why does an initial increase in autonomous spending increase income by more than the initial increase?

8- Explain the paradox of thrift (be careful to make a distinction between micro and macro level).

9- Say that \( a = 100, \) MPC = .9, and \( I = 100 \) (all other parameters are nil).
   a) \( Y^* = \)
   b) \( C^* = \) and \( S^* = ? \)

Say that the government wants to promote thriftiness at the individual level (i.e. increase the MPS by .4 so that MPS = .5) in order to promote aggregate saving
   c) \( Y^* = \)
   d) \( C^* = \) and \( S^* = ? \)
   e) Has the government been successful in its policy? What are the consequences of its policy? Is the economy better off?
   f) Why did we obtain these results? What are the economic forces that Neoclassical economists missed?
   g) Is the assertion that “individual savings add up to aggregate saving” true?
h) Did we have to go through all the questions from 11a) to 11g) to know that saving would not change? Why or Why?

Investment in Keynes’s General Theory.

1- What is the marginal efficiency of capital? Is it different from the MPK? Why? Why not?

2- How is investment determined in Keynes’s theory? Draw the graph that explains the determination of aggregate investment.
   a. What is the impact of expected higher inflation?
   b. What is the impact of long-term expectation of lower wage?
   c. What is the impact of a one-time decrease in wage?

3- Say that entrepreneurs have to decide to invest and have the following information:
   a. \( i = 2\% \)
   b. The following relationship exists between investment level and rate of return

<table>
<thead>
<tr>
<th>Amount of Investment spending (I)</th>
<th>Rate of return expected (mek)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>200</td>
<td>8%</td>
</tr>
<tr>
<td>300</td>
<td>7%</td>
</tr>
<tr>
<td>400</td>
<td>5%</td>
</tr>
<tr>
<td>500</td>
<td>2%</td>
</tr>
<tr>
<td>600</td>
<td>1%</td>
</tr>
</tbody>
</table>

Draw the curve that links I and mek. What is the level of investment that will be implemented?

4- What is the main variable that affects investment in Keynes’s theory?

5- How are long-term expectations determined in the General Theory?

6- Is this method of determination of expectation irrational?

7- “An act of individual saving means—so to speak—a decision not to have dinner to-day. But it does not necessitate having dinner or to buy a pair of books a week hence or a year hence or to consume any specified thing at any specified date.” (Keynes 1936, 210). Explain. How is this different from the Neoclassical analysis?