ASSIGNMENT #3
Due Thursday November 4
(at the beginning of the class)

Show all your calculations for credit.

Problem I - Policy

Suppose that the economy is characterized by the following equations (Y is output, YD is disposable income and i the rate of interest expressed as a percentage):

- consumption: \( C = 100 + 0.66Y_D \)
- investment: \( I = 800 - 16.66i \)
- tax: \( T = 600 \)
- government expenditure: \( G = 500 \)
- real money demand: \( L = Y - 100i \)
- money supply: \( M/P = 1200 \)
- price level: \( P = 1 \)

a. Write the equation for the IS curve for this economy, expressing Y as a function of i.

\[ Y = ... \]

b. Write the equation for the LM curve for this economy, expressing i as a function of Y.

\[ i = ... \]

c. Calculate equilibrium \( Y^e \) and \( i^e \) for the economy

\[ Y^e = \ldots \]
\[ i^e = \ldots \% \]
d. Show the IS and the LM curves as well as the equilibrium $Y^e$ and $i^e$ on the graph below (name all the curves and axes).

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e. Now assume that full employment income $Y_f$ is below equilibrium $Y^e$ just calculated.

i. What problem(s) for the economy can the Fed anticipate?

ii. What policy would the Fed carry out to avoid such problem(s).

iii. What is the effect of such policy on investment:

   increase or decrease or no change or indeterminate

   on consumption:

   increase or decrease or no change or indeterminate
f. Suggest a **policy mix** that would have achieved the same goal as the policy you suggested above (in ii.) without having any impact at all on investment.

Show the effect of your policy mix recommendations on the IS-LM graph below (the 2 curves below correspond to the equilibrium level of income $Y^e$ and interest $i^e$ previously calculated).

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**Problem 2 – labor statistics**

Suppose that

<table>
<thead>
<tr>
<th>Population Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>the civilian non institutional population is</td>
<td>50 million</td>
</tr>
<tr>
<td>the employed</td>
<td>25 million</td>
</tr>
<tr>
<td>the unemployed</td>
<td>1.5 million</td>
</tr>
</tbody>
</table>

use the information to answer the following questions:

a. what is the size of the labor force

b. how many people are out of the labor force

c. calculate the participation rate

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d. calculate the unemployment rate

          

e. calculate the non-employment rate

          

f. if every month 50,000 unemployed give up looking for a job while 100,000 find a job,
calculate the average duration of unemployment

          

g. using the data above, calculate the probability for an unemployed worker of finding a job within a month

          

h. how many new discouraged workers are there every month?

          

Problem 3 – labor market

Suppose that the firm's markup over costs is 20% and that the wage setting equation is

\[ W = zP(1-u) \]

where \( W \) is the nominal wage, \( z \) is a positive coefficient representing all the other variables that affect positively the outcome of wage setting, \( P \) is the price level (the price is constant) and \( u \) the unemployment rate (all the percentage are converted into decimal in the equations).

a. Use the price setting equation to calculate the real wage.

          

real wage = 

          

b. Calculate the corresponding **natural rate of unemployment** (as a percentage) assuming that $z$ is initially equal to 1.

\[ u^n = \text{__________} \% \]

c. Assume that as a result of an institutional change towards more generous unemployment benefits, $z$ increases by 10%, calculate the **real wage** and the **natural rate of unemployment** (as a percentage).

\[ \text{real wage} = \text{_______________} \quad u^n = \text{______________} \% \]

d. Show the effect of the increase in $z$ on the labor market graph below using the PS and the WS curves. (Name all the relevant axes and curves)