Problem 1 – labor statistics

Suppose that

- the civilian non institutional population is 50 million
- the employed 25 million
- the unemployed 1.5 million

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

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 2 – 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.

\[
\text{real wage} = \underline{\text{______________}}
\]

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

\[
\text{u}^n = \underline{\text{______________}} \%
\]

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).
real wage = ____________________  \[ u^n = \] ___________\%  

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)

Problem 3 - AS-AD model

During the mid eighties, the price of oil in the United States fell. Assume that the economy was originally at its long run equilibrium \( Y_n^o \). (Use the model of chapter 7 to answer this question)

a. Show on the price setting/wage setting graph below the effect of this reduction on the real wage and on the natural rate of unemployment \( u_n \). Name the axes and the two curves and show the shifts, if any, of the relevant curve or curves.
What happens to the markup $\mu$?
- increases
- decreases
- stays the same

What happens to the coefficient $z$?
- increases
- decreases
- stays the same

(positive effects on the wage setting equation)

What happens to the natural rate of unemployment $u_n$?
- increases
- decreases
- stays the same

What happens to the real wage?
- increases
- decreases
- stays the same

(underline the correct answer)

b. Now use the AD/AS graph and the IS/LM graph to illustrate the short run and medium run effects of the reduction in the price of oil. Name the axes and the curves and show the shifts, if any, of the relevant curve or curves. (use the subscript SR for the short run shifts and the subscript MR for the medium run shifts and use arrows to illustrate the direction of the shifts)
In the short run
What happens to output? increases decreases stays the same
What happens to the price level? increases decreases stays the same
What happens to the rate of interest? increases decreases stays the same

In the medium run (from short run to medium run equilibrium)
What happens to output? increases decreases stays the same
What happens to the price level? increases decreases stays the same
What happens to the rate of interest? increases decreases stays the same
(underline the correct answer)