General Equilibrium Problem 1

Part 1 - Introduction

Consider the following model of the economy

Production function: $Y = A \cdot K \cdot N - N^2/2$
Marginal product of labor: $MPN = 2A \cdot K - N$.

where the initial values of $A = 5$ and $K = 6$.

The initial labor supply curve is given as: $N^s = 20 + 3w$.

$C^d = 85 + .50(Y-T) - 500r$
$I^d = 50 - 500r$
$G = 50$
$T = 100$

$M^d/P = 85 + 0.5Y - 1000r$

Nominal Money supply $M = 400$

We assume that expected inflation is zero ($\pi^e = 0$) so that money demand depends directly on the real interest rate (since $i = r$).

1 a) (6 points) Solve for the labor market clearing real wage (w^*), the profit maximizing level of labor input (N^*), and the full employment level of output (Y^*). Please show work.

Part 2 – IS Curve

In the space below, draw two diagrams vertically with the labor market on the bottom graph and the production function on the top graph. Be sure to label everything including this initial equilibrium point as point A. **(10 points for completely labeled and correct diagrams)**

b) **(4 points)** Derive an expression for the IS curve (r in terms of Y). Please show all work

Derive desired saving function - set equal to desired investment - express (r iin term of Y)= to in

c) **(3 points)** Find the real interest rate that clears the goods market. Please show all work

d) **(3 points)** Find the price level needed to clear the money market. Please show all work

Part 3 – LM Curve

e) (3 **points**) Find the expression for the LM curve (r in terms of Y). Please show all work

Now draw three separate diagrams: (30 points total) a FE - IS – LM diagram, a desired savings equals desired investment ($S^d = I^d$), and a money market diagram locating this initial equilibrium point as point A. BE SURE to *LABEL* all diagrams completely (10 points for each correctly drawn and labeled diagram…each diagram will have three different equilibriums points A, B, and C)