(a) *Write down the choice problem face by a young person(write out the budget constraint in terms of l and c_2)*

$$\max U = \ln(l) + \beta c_2$$

$$s.t. \begin{cases} n + l = T \\ c_2 \leq \dfrac{v_{t+1}}{v_t}\omega n + a_{t+1} \end{cases} \implies l + c_2/[\omega\frac{v_{t+1}}{v_t}] \leq T + a_{t+1}/[\omega\frac{v_{t+1}}{v_t}]$$

(b) *What happens to real GDP in this economy as inflation rate rises? Explain?*

$$\max U = \ln(l) + \beta c_2$$

$$s.t.\ l + zc_2/\omega \leq T + za_{t+1}/\omega$$

$$a_{t+1} = (1 - \frac{1}{z})v_{t+1}M_{t+1} = (1 - \frac{1}{z})\omega n_{t+1}$$

$$\implies l + zc_2/\omega \leq T + (z-1)n_{t+1}$$

$$\max \ln(l) + \beta[T + (z-1)n_{t+1} - l]\frac{\omega}{z}$$

F.O.C

$$\frac{1}{l} - \beta\omega/z = 0$$

$$l = \frac{z}{\beta\omega}$$

$$y = \omega n = \omega(T - l) = \omega T - \frac{z}{\beta}$$

y decreases with higher inflation. Here we assume $\frac{z}{\beta\omega} \leq T$, otherwise people will choose not to work.

(c) *How to interpret the welfare cost of inflation in this economy?*

$$ln(l) + \beta[T + (z-1)n_{t+1} - l]\frac{\omega}{z} = \ln(z) - \ln(\beta\omega) + \beta(\omega T - \frac{z}{\beta}) = \ln(z) - z + C$$

which decreases with z when $z \geq 1$. Inflation is costly since it distorts the rate of return for money, driving the economy out of first-best allocation.