EC 313, Summer 2019 **Name:** ____________________
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Final - FORMULAS **UO ID:** ____________________

real GDP per person: $\mathbf{\frac{Y_t}{population}}$ — Y_t: real GDP at t

real GDP growth: $\mathbf{\frac{Y_t - Y_{t-1}}{Y_{t-1}}}$ — Y_{t-1}: real GDP at t-1

GDP deflator: $\mathbf{P_t = \frac{nGDP}{rGDP} = \frac{\$Y_t}{Y_t}}$ — $\$Y_t$: nominal GDP

inflation rate: $\boldsymbol{\pi_t} = \mathbf{\frac{P_t - P_{t-1}}{P_{t-1}}}$

labor force: $\mathbf{L = N + U}$ — U: unemployment; N: empolyment

unemployment rate: $\mathbf{u = \frac{U}{L}}$

participation rate: $\mathbf{\frac{L}{population}}$

production/outoput/supply/GDP: $\mathbf{Y = C + I + G}$ — C: consumption; I: investment; G: gov't spending

demand: $\mathbf{Z \equiv C + I + G}$

consumption: $\mathbf{C = c_0 + c_1 \times Y_D}$

disposable income: $\mathbf{Y_D = Y - T}$ — Y: income; T: tax

goods market equilibirum: $\mathbf{Y = \frac{1}{1-c_1}[c_0 + I + G - c_1 T]}$

demand for money: $\mathbf{M^d = \$Y \times L(i)}$

supply for money: $\mathbf{M^s = M}$

money market equilibirum: $\mathbf{\frac{M}{P} = YL(i)}$

IS relation: $\mathbf{Y = C(Y - T) + I(Y, i) + G}$

LM relation: $\mathbf{i = \bar{i}}$

real interest rate: $\mathbf{r_t = i_t} - \boldsymbol{\pi}^{\mathbf{e}}_{\mathbf{t+1}}$ — i_t: nominal interest rate; π^e_{t+1}: expected inflation

risk premium: $\mathbf{x = (1 + i)\frac{p}{1-p}}$ — i: interest rate on risk-free borrowing; p: probability of default

extended IS relation: $\mathbf{Y = C(Y - T) + I(Y, r + x) + G}$ — r: real interest rate; x: risk premium extended LM relation: $\mathbf{r} = \bar{\mathbf{r}}$ | $\bar{r}$: policy rate

wage-setting: $\mathbf{W} = \mathbf{P^e F(u, z)}$ | P^e: expected prices; u: unemployment rate; z: catchall factor

price-setting: $\mathbf{P} = \mathbf{(1 + m)W}$ | W: nominal wages; P: prices; m: markup

labor market eq.: $\mathbf{F(u_n, z)} = \frac{\mathbf{1}}{\mathbf{1+m}}$ | u_n: natrual rate of unemployment/natural rate

the natural rate of unemployment: $\mathbf{u_n} = \frac{\mathbf{m+z}}{\alpha}$ | α: parameter

static expectations: $\pi_{\mathbf{t}}^{\mathbf{e}} = \bar{\pi}$ | π_t^e: expected inflation; $\bar{\pi}$: a constant

adaptive expectations: $\pi_{\mathbf{t}}^{\mathbf{e}} = (\mathbf{1} - \theta)\bar{\pi} + \theta\pi_{\mathbf{t-1}}$ | θ: parameter

the theoretical Phillips Curve I: $\pi_{\mathbf{t}} = \pi_{\mathbf{t}}^{\mathbf{e}} + (\mathbf{m + z}) - \alpha\mathbf{u_t}$ | u_t: unemployment rate in period t

the theoretical Phillips Curve II: $\pi_{\mathbf{t}} - \pi_{\mathbf{t}}^{\mathbf{e}} = \frac{\alpha}{\mathbf{L}}(\mathbf{Y_t} - \mathbf{Y_n})$ | Y_n: potential/natural output

the theoretical Phillips Curve III: $\pi_{\mathbf{t}} = \pi_{\mathbf{t}}^{\mathbf{e}} - \alpha(\mathbf{u_t} - \mathbf{u_n})$ | Y_t: output in period t

the original Phillips Curve I: $\pi_{\mathbf{t}} = \bar{\pi} + (\mathbf{m + z}) - \alpha\mathbf{u_t}$ | π_t: inflation in period t

the original Phillips Curve II: $\pi_{\mathbf{t}} - \bar{\pi} = \frac{\alpha}{\mathbf{L}}(\mathbf{Y_t} - \mathbf{Y_n})$ | L: labor force

the original Phillips Curve III: $\pi_{\mathbf{t}} - \bar{\pi} = -\alpha(\mathbf{u_t} - \mathbf{u_n})$

the modified Phillips Curve I: $\pi_{\mathbf{t}} = \pi_{\mathbf{t-1}} + (\mathbf{m + z}) - \alpha\mathbf{u_t}$ | π_{t-1}: inflation in period t-1

the modified Phillips Curve II: $\pi_{\mathbf{t}} - \pi_{\mathbf{t-1}} = -\alpha(\mathbf{u_t} - \mathbf{u_n})$

the modified Phillips Curve III: $\pi_{\mathbf{t}} - \pi_{\mathbf{t-1}} = \frac{\alpha}{\mathbf{L}}(\mathbf{Y_t} - \mathbf{Y_n})$

the Okun Law: $\mathbf{Y_t} - \mathbf{Y_n} = -\mathbf{L} * (\mathbf{u_t} - \mathbf{u_n})$

Inflation Targeting: $\pi_{\mathbf{t}} = \pi^* - \alpha(\mathbf{u_t} - \mathbf{u_n})$ | π^*: inflation target; i^*: target nominal interest rate

The Taylor Rule: $\mathbf{i_t} = \mathbf{i}^* + \alpha(\pi_{\mathbf{t}} - \pi^*) - \beta(\mathbf{u_t} - \mathbf{u_n})$ | i_t: the nominal policy rate; α, β: parameters