ECON 205 Midterm 1 One-Page Cram Sheet

1) Core Identities

- GDP (spending): $Y = C + I + G + NX$
- Net exports: $NX = X - M$
- Private saving: $S_p = Y - C - T$
- Public saving: $S_g = T - G$
- National saving: $S = S_p + S_g = Y - C - G$
- Open economy identity: $S = I + NX$
- GDP deflator: $\text{Def} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$
- Inflation (deflator): $\pi_t^{\text{Def}} = \frac{\text{Def}_t - \text{Def}_{t-1}}{\text{Def}_{t-1}}$
- Labor force: $\text{LF} = E + U$
- Unemployment rate: $u = \frac{U}{\text{LF}}$
- LFPR: $\text{LFPR} = \frac{\text{LF}}{\text{Adult population}}$
- EPOP: $\text{EPOP} = \frac{E}{\text{Adult population}}$
- Real interest (approx): $r \approx i - \pi^e$

2) Demand/Supply Rules

- Demand curve: negative price-quantity relationship.
- Supply curve: positive price-quantity relationship.
- Price change alone -> movement along curve.
- Non-price change -> shift of curve.
- Price ceiling below equilibrium -> binding -> shortage.
- Price floor above equilibrium -> binding -> surplus.

3) Elasticity + Revenue

- Midpoint elasticity: $\varepsilon_D = \frac{\frac{Q_2 - Q_1}{(Q_2 + Q_1)/2}}{\frac{P_2 - P_1}{(P_2 + P_1)/2}}$
- Demand elastic if $|\varepsilon_D| > 1$; inelastic if $|\varepsilon_D| < 1$.
- Elastic demand: price up -> revenue down.
- Inelastic demand: price up -> revenue up.

4) Real vs Nominal

- Nominal GDP uses current prices.
- Real GDP uses base-year prices.
- Real GDP growth is output growth; nominal growth mixes output and inflation.
- Deflator and CPI can differ: production basket vs consumer basket.

5) Labor Market Concepts

- Unemployed = not working AND actively searching.
- Discouraged workers are out of labor force.
- Natural unemployment mostly frictional + structural.
- Cyclical unemployment rises in recessions.

6) Production and Growth

- Production function: $Y = F(A, K, L)$.
- Labor productivity: $\frac{Y}{L}$.
- Capital productivity: $\frac{Y}{K}$.
- $Y = AK^{0.5}L^{0.5}$:
  - K doubles (A, L fixed) $\rightarrow Y \times \sqrt{2}$ (diminishing marginal return to K)
  - K and L both double $\rightarrow Y \times 2$ (constant returns to scale)
- Long-run growth engine: technology (A), supported by R&D + human capital.

7) Top Exam Traps

1. Using population instead of labor force in unemployment rate.
2. Counting transfers as G in GDP.
3. Counting used goods in GDP.
4. Mixing up demand shifts vs movement along demand.
5. Forgetting to use midpoint formula for elasticity.
6. Forgetting NX sign when labeling deficit/surplus.
7. Confusing marginal returns with returns to scale.

8) 10-Minute Final Check

- Can I do one GDP table problem quickly?
- Can I compute deflator + inflation correctly?
- Can I compute LF, u, LFPR, EPOP?
- Can I compute S_p, S_g, S, and NX from $S = I + NX$?
- Can I draw and label a binding price control graph cleanly?
- Can I explain elasticity-revenue link in one sentence?