

Queen's University
Economics 222
Midterm Test

Instructions: *You have 2 hours: budget your time carefully.*
Hand calculators are allowed.

Part A - Answer 5 of the following 6 questions. Each question is worth 8 marks.

1. For the base year the GDP deflator is equal to 100. In any other year, if the GDP deflator is lower than 100 then we must be experiencing deflation. Assess this claim.
2. The employment ratio is the number of employed people divided by the labor force. If the participation rate increases by 10% and the employment ratio increases by 20% then the unemployment rate must decrease. Comment on these two assertions.
3. If Ricardian equivalence doesn't hold, a tax cut increases current private saving. If the Ricardian equivalence holds, a tax cut increases current private saving. Comment on these two assertions.
4. Use a detailed diagram to explain what happens in the growth model if the population growth rate decreases.
5. In the model with two large open economies if one country cuts its government expenditures, the other country will experience a decline in savings. Assess this claim.
6. At the current expected inflation rate, a nominal bond and a real return bond are expected to give the same nominal return. If the inflation rate turns out to be lower than expected, the real return bond yields a higher return. Assess this claim.

Part B - Answer 2 of the following 3 questions. Each question is worth 30 marks.

1. Consider an economy composed of two sectors. In the biotech sector (the first sector), vaccines are produced from labour and capital. The production function for this sector is: $Y_1 = K_1^{0.5} N^{0.5}$. In the military sector (the second sector) arms are produced from energy and capital and the production function is: $Y_2 = K_2^{0.5} E^{0.5}$. The labour supply is $N = 100$, the total capital stock is: $K = 13 = K_1 + K_2$, and the energy price is P_e .

- a) Find a formula for the demand for energy as a function of K_2 and P_e .
- b) Assume from now on that $E = 225$. If capital can be freely allocated across sectors, what will K_1 and K_2 be?
- c) What is the equilibrium real wage?
- d) The government introduces a minimum wage $w_m = 0.2$. What will employment be?

2. Romeo lives for two periods and he wants to consume twice as much during the first period as in the second period ($C_1 = 2C_2$). His income is $Y_1 = 70$ in the first period and $Y_2 = 19$ in the second period. The real interest rate is $r = 0.10$.

- a) What will Romeo's consumption and saving be in the first period?
- b) If $Y_1 = 50$ instead, what must Y_2 be to keep Romeo's consumption profile unchanged?
- c) If the interest rate decreases to $r' < 0.10$, which income profile (i.e. $Y_1 = 70$ and $Y_2 = 19$ or the one found in part b)) would Romeo favor?
- d) What income profile (i.e., what values of Y_1 and Y_2) makes Romeo indifferent to changes in the interest rate if he has the consumption profile found in part a)?

3. Guatemala's production function is $Y_t = K_t^{0.5} N_t^{0.5}$. The population growth rate is: $n = 0.06$, the depreciation rate is: $d = 0.09$ and the saving rate is $s = 0.30$.

- a) Write the production function in intensive form. Show the intermediate steps.
- b) What is the steady-state level of consumption per capita in Guatemala?
- c) If the capital-labour ratio is currently $k_t = 2$, what will it be next year?
- d) If the population growth rate decreases to $n = 0.02$, what is the saving rate that will keep the steady-state consumption per capita at the same level as in part a)?