Midterm - Answer Key

Part A

1. In order to experience deflation, the GDP deflator must decline from one year to the following year. Whether it is above or below 100 is irrelevant.

2. The employment ratio is the number of people employed divided by the working age population. Using the identity seen during class: $a(1-u) = e$, one can write the unemployment rate as: $u = 1 - e/a$. If e increases faster than a, then the unemployment rate must be declining.

3. Both proposition are true. However one can note that if Ricardian equivalence holds, current consumption won't increase and national saving will be unchanged. If Ricardian equivalence doesn't hold, current consumption will increase and the rise in private saving will be insufficient to prevent national saving from falling.

4. Relevant diagram.

5. The claim is true. A decline in government expenditure in one country will increase saving in this country and put downward pressure on the world real interest rate. The level of saving in the other country will decrease.

6. If the inflation rate turns out to be lower than expected, the nominal bond will yield the higher return.

Part B

1. a) $MPE = P_e$. $\frac{\partial Y_2}{\partial E} = \frac{K_2^{0.5}}{2E^{0.5}} = P_e$. $E^d = \frac{K_2}{4P_e^2}$.

b) $MPK_1 = MPK_2$. $\frac{N^{0.5}}{2K_1^{0.5}} = \frac{E^{0.5}}{2K_2^{0.5}}$. Using the fact that $K_1 + K_2 = 13$, one can find that $K_1 = 4$ and $K_2 = 9$.

c) $MPN = w$. $\frac{\partial Y_1}{\partial N} = \frac{K_1^{0.5}}{2N^{0.5}} = w$. $w = 0.10$.

d) $MPN = w$. $\frac{K_1^{0.5}}{2N^{0.5}} = w = 0.2$. $N = 25$.

2. a) Let C be the consumption in the second period. $2C + \frac{C}{1.1} = 70 + \frac{19}{1.1}$. Solving yields $C = 30$ and $C_1 = 60$. $S_1 = Y_1 - C_1 = 10$.

b) $50 + \frac{Y_2}{1.1} = 70 + \frac{19}{1.1}$. $Y_2 = 41$.

c) Romeo will prefer the income stream in part b) because as a borrower a decrease in the interest rate is favorable. In part a) Romeo is a saver.

d) If $Y_1 = 60$ and $Y_2 = 30$, Romeo doesn't need to borrow or lend, hence he is indifferent to changes in the interest rate.

3. a) $y = k^{0.5}$.

b) $(n + d)k = sk^{0.5}$. $k = 4$. $c = (1 - s)y = k^{0.5}$. $c = 1.4$.

c) $k_{t+1} = \frac{(1-d)k_t}{1+n} + \frac{sk_t^{0.5}}{1+n}$. $k_{t+1} = 2.117$.

d) $(n + d)k = sk^{0.5}$ and $k = 4$, $n = 0.02$ and $d = 0.09$. Solving yields $s = 0.22$.