

Midterm 1 Solution Key

Economics 101 (Fall 2009)

Regrade policy: If you would like your test regraded, please submit a written statement to explain why. Your entire test will be regraded, so there is a possibility that points could be lost rather than gained.

Multiple Choice:

Version A: 1) d 2) c 3) b 4) c 5) b 6) c 7) a 8) d

Version B: 1) d 2) a 3) d 4) c 5) c 6) b 7) c 8) b

Problem 1: Neoclassical Model

a) $Y^s = 12 * 1000^{1/3} 1000^{2/3} = 12 \times 1000 = \underline{12,000}$.
 $Y^d = C + I + G = [1000 + 0.6(12,000 - 2000)] + [3000 - 1000r] + 2200$
 setting $Y^s = Y^d$: $12,000 = 12,200 - 1000r$
 so $-200 = -1000r$ so $r = \underline{0.20}$

$$W/P = MPL = 12(2/3)K^{1/3} L^{-1/3} = 8 \cdot 1000^{1/3} 1000^{-1/3} = \underline{8}$$

The equilibrium condition is that investment must equal saving.

b) Version A: a,a,b,a,c,c

Version B: b,b,a,b,c,c

c) Version A: b,b,a,b,a,b

Version B: a,a,b,a,b,a

Problem 2: Solow Growth Theory

a) golden rule condition: $MPK = \delta + n$

Plugging in: $k_{gold}^{*-1/2} = 0.10$ so $k_{gold}^{*1/2} = 10$ and so $k_{gold}^* = \underline{100}$.

b) steady state condition: $s f(k^*) = (\delta + n) k^*$

plugging in: $s 2k^{*1/2} = 0.10k^*$

solve for s: $s 2(100)^{1/2} = 0.10(100)$ so $20s = 10$, so $s = \underline{0.5}$.

Solve for consumption: $c = (1-s)y = (1-s) 2k^{*1/2} = (1-0.5)2(100^{1/2}) = 0.5 * 20 = 10$.

c) A saving rate lower than 0.5 would result in less saving and investment, so that only a smaller capital stock could be maintained as a steady state. Although a larger fraction of output is used for consumption, the total level of output would be so much lower that this is actually a smaller amount of consumption.

A saving rate higher than 0.5 would lead to more saving and investment, so that a larger capital stock can be maintained. But because capital has a diminishing marginal product, the extra level of output is too small to make up for the fact that a smaller fraction of this output is used for consumption.