

Microeconomics, Module 23, "Allocating Goods over Time" (Chapter 17)

*Illustrative Test Questions*

(The attached PDF file has better formatting.)

{Note: Only a few pages from the chapter on allocating goods over time are covered on the final exam. The illustrative test questions below cover all sections of this chapter; you are responsible only for the sections listed in the required readings.}

Question 23.1: Bond Rates

A bond with a \$60,000 face value sells at a \$10,000 discount one year prior to its maturity. The nominal annual interest rate paid by the bond is

- A. 6%
- B. 8.33%
- C. 16.67%
- D. 20%
- E. Depends on the inflation rate.

Answer 23.1: D

$$\$10,000 / (\$60,000 - \$10,000) = 20\%.$$

Question 23.2: Bond Investors

By definition, the buyer of a bond must be a

- A. Lender
- B. Borrower
- C. Representative agent
- D. Seller
- E. Financial intermediary

Answer 23.2: A

(The buyer of a bond lends money to the issuer of the bond.)

Question 23.3: Perpetuity

What is the present value of a perpetuity paying \$120 per year when the interest rate is 8%?

- A. \$960
- B. \$1,111
- C. \$1,296
- D. \$1,500
- E. The present value depends on the inflation rate.

Answer 23.3: D

$$\$120 / 8\% = \$1,500$$

#### Question 23.4: Real and Nominal Interest Rates

An investor with \$10,000 in an IRA account that pays a nominal interest rate of 10% expects inflation to remain at 4% or less. What real interest rate does the investor expect to receive on this IRA account?

- A. 10%
- B. At least 6%
- C. At least 4%
- D. 4% or less
- E. At least 2.5%

Answer 23.4: B

#### Question 23.5: Time Value

The market rate of interest is 20%. A producer can make a quality improvement in his product that will increase its value to consumers by \$36 per year (at the beginning of the year) for a three year period. Should the producer make the quality improvement?

- A. No, because it will lower his sales.
- B. Only if it costs less than 20% of the marginal cost.
- C. Yes, as long as it costs less than \$36.
- D. Yes, as long as it costs less than \$91.
- E. Yes, as long as it costs less than \$180.

Answer 23.5: D

$$\$36 + \$36 / 1.2 + \$36 / 1.2^2 = \$91.00$$

#### Question 23.6: Financing Plans

Suppose the government spends \$3,000 per person this year. The market for borrowing and lending is competitive, and the market interest rate is 10%. Which of the following plans to finance the government's spending is best for consumers? Consider consumers in aggregate, not individual consumers.

- A. A tax of \$3,000 per person this year.
- B. A tax of \$3,300 per person next year.
- C. An annual tax of \$300 per person forever.
- D. \$3,000 this year equals \$3,300 next year, but both are less than \$300 each year.
- E. All of the above plans have the same effect on consumers.

Answer 23.6: E

#### Question 23.7: Tax on Farmland

The market rate of interest is 5%. The government imposes an annual tax of \$30 per acre on farmland. The supply of farmland is fixed, and the market for farmland is competitive. The year after the tax is imposed, a landowner sells an acre of land on which he grew wheat. How is the economic burden of the tax divided between the landowner and buyer?

- A. The tax costs the original landowner \$600, and it costs the buyer nothing.

- B. The original landowner pays \$30 in taxes, and the buyer pays \$30 annually for as long as he owns the land.
- C. The original landowner pays \$30 in taxes; the price of land rises by \$30 to compensate.
- D. The entire burden of the tax falls on the buyer, because the original landowner increases the price of his land by \$30 to compensate him for the tax.
- E. The price of the original landowner's land falls so that the burden of the tax is equally divided between him and the buyer.

Answer 23.7: A

*Question:* Where in the text is this covered?

*Answer:* The tax is a fixed cost; it does not depend on the crops produced from the land, so it does not affect the price of the crops (or anything else produced from the land). The present value of all future tax payments is a reduction to the rental value of the land.

Question 23.8: Interest Rates and Mining Costs

The market rate of interest is 15%. The price of copper is determined competitively, and the marginal cost of extracting copper from the mines is assumed to be zero. Owners of copper mines, after taking their current plans to mine copper into account, expect the price of copper to be \$50 per ton this year and \$55 per ton next year. If the owners want to maximize their profits, how should they adjust their plans to mine copper?

- A. Owners should do more mining this year and less mining next year.
- B. Owners should do less mining this year and more mining next year.
- C. Owners should continue their plans to mine copper without any changes.
- D. Changes in the owners' plans are irrelevant, because their profits will be the same no matter when they mine the copper.
- E. Owners' optimal plans depend on the marginal value of copper.

Answer 23.8: A

The price of copper is expected to increase 10% this coming year, but the interest rate is 15%. The real price of copper will fall over the coming year. If the owners mine the copper this year, sell it for \$50 a ton, and invest the cash at 15% annual interest, they will have \$57.50 per ton next year, which is more than \$55 per ton.

Question 23.9: Interest Rate Changes

Which of the following would not cause an increase in the interest rate?

- A. A decrease in consumers' current wealth that does not affect their future wealth.
- B. An increase in consumers' future wealth independent of the productivity of capital.
- C. An increase in the future productivity of capital.
- D. A drought that destroys most of the summer crop on farms.
- E. A permanent increase in productivity that is effective immediately.

Answer 23.9: E

The interest rate is the relative value of next year's consumption vs current consumption. A permanent increase in productivity that is effective immediately does not change the relative value of current vs future consumption, so it does not change the interest rate.

Question 23.10: Current Consumption

When investment is possible, the supply of current consumption vs future consumption is determined by

- A. The marginal value of current consumption.
- B. The marginal product for capital.
- C. The marginal product of labor.
- D. People's endowments.
- E. The present value of the dividends people earn from their assets.

Answer 23.10: B

Question 23.11: Marginal Product of Capital

Suppose the marginal product of capital is expressed as a percentage of output. If the interest rate is larger than the marginal product of capital, then

- A. People's holdings of capital will fall until its marginal product equals the interest rate.
- B. The demand for capital will increase.
- C. Increased investment in capital and a shortage of lenders will lower the interest rate and raise the marginal product of capital.
- D. Increased investment in capital and a shortage of lenders will raise the interest rate and lower the marginal product of capital.
- E. The representative agent's budget line is steeper than his indifference curve at his endowment point.

Answer 23.11: A

Cash invested in a saving account earns more than capital, so people sell their capital and hold cash.

Question 23.12: Temporary Improvement in Productivity

Suppose that the supply of current consumption is fixed by people's endowments and that investment in capital is impossible. When a temporary improvement in productivity increases people's current endowments but does not affect their future endowments, the equilibrium interest rate

- A. Rises
- B. Falls
- C. Remains unchanged
- D. Rises if the income effect dominates and falls otherwise
- E. Rises if the substitution effect dominates and falls otherwise

Answer 23.12: B

Since current wealth increases, people want to save more. Unless there is a corresponding increase in the demand for loans, the interest rates falls.