Mid Semester Exam (Answer Key with Detailed Solutions)

Course: Money and Banking | Course Code: ECO 223

Total points: 25 | Weightage towards final grade: 25%

Date: 17/04/2023 | Time: 1:30 PM - 2:30 PM

Answer Key

1. A 2. B 3. D 4. D 5. E 6. A 7. D 8. B 9. F 10. E 11. F

12. B 13. D 14. C 15. Marks for everyone. 16. B 17. E 18. $p_B \leq c$

19. C 20. C

Detailed Solutions

Section I

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1. If a \$5,000 face-value discount bond maturing in one year is selling for \$5,000 has no coupon payments, then its yield to maturity is

   (A) 0% (B) 5% (C) 10% (D) -10%

   Answer. Price=Face Value and Coupon rate is 0. Coupon Rate=YTM=0.

2. If a bank only has one service (that is the main service of taking deposits and lending money), which of these does it not benefit much from

   (A) Economies of scale (B) Economies of scope (C) Reduced transaction costs

(D) Expertise

Answer. Economies of scope, which come from the expertise that one gets from providing multiple services in a similar area.

3. We know that financial markets are among the most heavily regulated sectors in the economy. What explains this the best?

   (A) Economies of scale (B) Free-rider problem (C) Upward sloping yield curve

   (D) Adverse selection (E) None of these.

   Answer. Adverse selection. This is basically to solve the information asymmetry problem and make it compulsory for firms to keep investors informed.

4. The "Segmented Markets Theory" treats two bonds that have same maturity but different coupon rates and face values as

   (A) Perfect complements (B) Perfect Substitutes (C) Patial supstitutes

   (D) It does not comment on the issue.

   Answer. It comments on similar bonds with different maturities.

5. $\sqrt[n]{\frac{\text{Current Price}}{\text{Face Value}}} - 1$, where n is number of periods to maturity represents the YTM of

   (A) Coupon Bond (B) Zero-Coupon Bond (C) Simple loan

   (D) Class A stock (E) None of the above

   Answer. None of the above. Not much to explain.

6. Compared to an economy that uses a medium of exchange, in a barter economy

   (A) transaction costs are higher.

   (B) transaction costs are lower. (C) The relationship is conditional on the laws of the land. (D) None of the above.

   Answer. Transaction costs are higher, because it is very costly to figure out the set of prices.

7. Without being too technical, interest rates can be thought of as (the phrase I use in class)

   (A) The result of a classic "holdout problem" (B) Similar to M1

   (C) A barrier to growth (D) The rent for money/price for money.

   (E) I don't come to class (No negative marking for this option. Your honesty is appreciated).

   Answer. The rent for money/price for money. We have discussed this in class in detail.

8. Higher government deficits _____ the supply of bonds and shift the supply curve to the _____, everything else held constant.

   (A) increase; left (B) increase; right (C) decrease; left (D) decrease; right

   Answer. The answer is B. It is in your slides.

9. Which of these has no impact on the demand for a bond according to the "Theory of Portfolio Choice"

   (A) Wealth (B) Expected return relative to alternate assets

   (C) Risk of its returns relative to alternative assets.

   (D) Liquidity relative to alternative assets.

(E) (A), (B), (C), & (D) all impact on the demand for a bond, but have nothing to do with the "Theory of Portfolio Choice" (F) None of the above.

Answer. All of these have an impact and this is indeed the Theory of Portfolio Choice.

10. Consider the following relationship

$$i_{nt} = \frac{i_t + i^e_{t+1} + i^e_{t+2} + ... + i^e_{t+n}}{n}$$

this relationship to explain interest rate is given by

(A) Expectations theory (B) Liquidity premium theory

(C) Segmented markets theory (D) Efficient market hypothesis

(E) None of the above

Answer. None of the above. Though Expectations theory does say

$$i_{nt} = \frac{i_t + i^e_{t+1} + i^e_{t+2} + ... + i^e_{t+(n-1)}}{n}$$

11. Which of the following is true?

(A) Stocks are the most important sources of external financing for businesses.

(B) The financial system is among the least heavily regulated sectors of the economy to allow for free trade.

(C) Collateral is an rarely used in debt contracts.

(D) Indirect finance is many times less important than direct finance.

(E) Financial intermediaries, particularly banks, are the most inaccessible source of external funds used to finance businesses.

(F) None of the above are true.

Answer. None are true. Not much to say.

12. If a perpetuity has a price of \$500 and an annual interest payment of \$25, the interest rate is

    (A) 2.5% (B) 5% (C) 7.5% (D) 10%

    Answer. 5%. This is a direct outcome of the formula for YTM for perpetuities.

13. When low quality goods drive high quality goods out of the market (even if there is demand for high quality good at the given price), it is called

    (A) Transaction failure. (B) Decreasing returns to asymmetric information

    (C) Information bias (D) None of the above.

    Answer. None. It is called market failure.

14. The weakened ability of private firms to profit from selling information will mean that less information is produced in the marketplace. This is because of the:

    (A) Adverse selection problem. (B) Moral Hazard Problem

    (C) Free-rider problem. (D) This actually helps solve market failure.

    Answer. Free rider-problem. It is described in your slides. Intuition is that people benefit of information others purchase.

15. A 5 rupee coin is:

    (A) Commodity money. (B) Fiat money (C) Token money.

    (D) None of the above.

    Answer. At the basic level, a coin is always commodity money, and it is quite straightforward, because it has intrinsic value, i.e., a coin can be melted and sold for an amount similar to its currency value. However, even as the value of the metal fluctuates, it is

guaranteed by the federal authorities to be worth a certain amount (e.g., 5 rupees). So, it is a bit of a combination of the two, and in many senses, it is indeed fiat money. **Everyone will receive marks for this.**

Section II

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16. Consider two assets whose returns are random variables X and Y. In which of the cases can you unequivocally reject X for Y (assuming that price is not a concern)

    (A) $\mathbb{E}(X) \geq \mathbb{E}(Y) \quad \& \quad \mathbb{E}(X^2) - \big(\mathbb{E}(X)\big)^2 \geq \mathbb{E}(Y^2) - \big(\mathbb{E}(Y)\big)^2$

    (B) $\mathbb{E}(X) \leq \mathbb{E}(Y) \quad \& \quad \mathbb{E}(X^2) - \big(\mathbb{E}(X)\big)^2 \geq \mathbb{E}(Y^2) - \big(\mathbb{E}(Y)\big)^2$

    (C) $\mathbb{E}(X) \leq \mathbb{E}(Y) \quad \& \quad \mathbb{E}(X^2) - \big(\mathbb{E}(X)\big)^2 \leq \mathbb{E}(Y^2) - \big(\mathbb{E}(Y)\big)^2$

    (D) $\mathbb{E}(X) \geq \mathbb{E}(Y) \quad \& \quad \mathbb{E}(X^2) - \big(\mathbb{E}(X)\big)^2 \leq \mathbb{E}(Y^2) - \big(\mathbb{E}(Y)\big)^2$

    Answer. $\boldsymbol{\mathbb{E}(X) \leq \mathbb{E}(Y) \quad \& \quad \mathbb{E}(X^2) - \big(\mathbb{E}(X)\big)^2 \geq \mathbb{E}(Y^2) - \big(\mathbb{E}(Y)\big)^2}$

    $\mathbb{E}(X)$ = Expectation of X, and $\mathbb{E}(X^2) - \big(\mathbb{E}(X)\big)^2$ = Variance of X. Naturally, if the mean is higher and the variance is lower, you would choose that option, as it is both safer and likely to have higher returns. This is the case for Y in (B).

For 17. and 18., consider the following scenario: there are 2 assets, A and B. p_i is the price of asset i where $i \in \{A, B\}$. $p_B - p_A < c - b \geq 0$. You have to sell the asset in the next period itself. For simplicity, assume interest rate $r = 0$. The selling price of the asset is uncertain, and is given by s_i. $s_A \in [a, b]$ where $\mathbb{E}(s_A) = \frac{a+b}{2}$. $s_B \in [c, d]$ where $\mathbb{E}(s_B) = \frac{c+d}{2}$. $a, b, c, d, p_A, p_B > 0$. $\text{Var}(s_B) >> \text{Var}(s_A)$.

17. Which of the following would be the optimal choice?

    (A) A (B) B (C) Some combination of B and A to mitigate risk.

(D) Avoid buying either (E) Can't say.

Answer. **Answer: Can't say**. $c - b \geq 0$ which means $a \leq b \leq c \leq d$ and all numbers are positive. Additionally, the price difference between B and A is less than the difference between c and b. Hence, B will always be better than A, regardless of the variance. The mean too, is irrelevant. However, if p_B itself is higher than c, the return could be negative. If it is higher than d it would always be negative. Hence we cannot say for sure.

18. If the answer to 17. is not (B), specify an additional condition that would make it (B). If the answer to 17. is not (A), specify an additional condition that would make it (A). If the answer to 17. is neither (A) not (B), specify an additional condition that would make it (B), regardless of the realised value of s_i. (this is just a single mathematical inequality/equality)

Answer. $\boldsymbol{p_B \leq c}$ .If we can guarantee that the return will be positive, or at least non-negative, we can buy B over A. This will happen if $p_B \leq c$.

19. Which of these approximations is important for expectations theory (basic two period model taught in class)?

(A) $2i_{2t} \approx 0$ (B) $i_t \approx i^e_{t+1}$. (C) $(i_t)\,(i^e_{t+1}) \approx 0$ (D) None of the above.

Answer. $(i_t)\,(i^e_{t+1}) \approx 0$. It is in your proof.

20. A demand curve for bonds shows

(A) The unique price one is willing to pay for a given quantity of bonds.

(B) The relationship between i (don't ask what that means, of course it is not $\sqrt{-1}$) and quantity of bonds demanded.

(C) Something else.

Answer. Something else. It is the **maximum** price one is willing to pay for a given quantity of bonds. Also, it is the relationship between price and quantity.

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