

THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY
ECON 3123 Midterm Exam

Date: Oct 10, 2025

Time allowed: 80 minutes

Not to be taken away.

Instructions:

- Answer ALL the questions. Write your answers on the answer book. Anything written on the question book will NOT be graded.
- Write your answer to all the multiple choice questions on one page together. Use one separate page for each short-answer question, and separate subquestions within one question by 1 to 2 blank lines.
- Make sure that all your handwritngs are legible. Anything that cannot be understood by the grader will not be graded.
- Please submit BOTH the question book and the answer book after the exam.

DO NOT OPEN UNTIL INSTRUCTED!

Name:

Student ID:

Multiple Choice Questions (20 points)

4 points each. Choose the one alternative that best answers the question.

1. Suppose a country has 10 million people, of whom 8 million are working age. Of these 8 million, 5 million have jobs. Of the remainder: 1 million are actively searching for jobs; 1 million would like jobs but are not searching; and 1 million do not want jobs at all. The official unemployment rate is
 - A. 0.1
 - B. 0.125
 - C. 0.143
 - D. 0.167
 - E. 0.28
2. A firm's value added equals
 - A. its revenue minus all of its costs.
 - B. its revenue minus its wages.
 - C. its revenue minus its wages and profit.
 - D. its revenue minus its cost of intermediate goods.
 - E. none of the above
3. Suppose all the nominal variables are the same, if the expected inflation rate rises, the real PDV will
 - A. fall.
 - B. rise.
 - C. remain unchanged.
 - D. none of the above

4. Suppose that the recent fall of Silicon Valley Bank makes bank managers in all the other banks want to hold a higher fraction of deposit as reserve. This will cause:
- A. an increase in the monetary base (H)
 - B. a reduction in H and a reduction in the money multiplier
 - C. an increase in the money multiplier
 - D. a reduction in the money multiplier
5. If the central bank wants to cut the federal funds rate, it can:
- A. increase the reserve requirement for banks.
 - B. sell bonds in the market for bonds.
 - C. buy bonds in the market for bonds.
 - D. increase the discount rate.
 - E. none of the above.

Short-Answer Questions (80 points)

Write your calculation and explanation to get full scores. Partially correct steps earn partial credits.

Question 6: Goods Market and Fiscal Policy (20 points)

Consider an economy with the following behavior equations:

$$C = c_0 + c_1 Y_D$$

$$I = b_0 + b_1 Y - b_2 i$$

$$T = t_0 + t_1 Y$$

$$Y_D = Y - T.$$

i is the nominal interest rate set by the central bank and G is government spending.

Assume that t_1 is between 0 and 1, and $c_1 + b_1 < 0.5$.

- a. (5 points) Solve for equilibrium output and taxes.

Suppose that the government starts with a balanced budget ($G = T$) and that there is a drop in b_0 .

- b. (10 points) How should the government adjust its spending G in order to keep the budget balanced? Does this government spending adjustment counteract or reinforce the effect of the drop in b_0 on output? **Explain your answers in words.**
- c. (5 points) After the adjustment of government spending G that rebalances the budget, what happens to the equilibrium private saving?

Question 7: Bank Crisis and Monetary Policy (30 points)

Suppose that an economy is described by the following equations

$$C = 0.5 + 0.2(Y - T)$$

$$I = 0.2 + 0.3Y - 2.5(i + x)$$

$$Z = C + I + G$$

$$G = 1, \quad T = 1$$

$$i = \bar{i}$$

$$x = 5\%$$

$$\frac{M^d}{P} = Y \times (0.7 - 4i)$$

The current GDP deflator is 2. The public holds 20% of the money in currency and the rest in checkable deposits. The average reserve ratio of the commercial banks is 25%.

- a. (10 points) Derive the equilibrium output as a function of the nominal interest rate (*IS* relation).
- b. (10 points) Suppose the nominal interest rate target \bar{i} is 5%. Compute the monetary base that can achieve the interest rate target.

Suppose there is a banking crisis which makes the average reserve ratio of the commercial banks increase from 25% to 30%.

- c. (5 points) Suppose that the central bank wants to restore the equilibrium nominal interest rate back to its target 5%, how much should the new monetary base be?

Suppose due to the same banking crisis, the risk premium x also increases from 5% to 15%.

- d. (5 points) Calculate the new monetary base that is necessary for the central bank to keep the nominal interest rate unchanged from its 5% target.

Question 8: Bond price and yield (30 points)

Consider two types of bonds: a 2-year bond and a 3-year bond. Both types have face value equal to \$100.

The current risk free one-year interest rate is 4% and the risk premium is 5%.

The market expects the central bank to cut risk-free one-year interest rate to 3% next year and 2% the year after.

- a. (10 points) What should be the current price for the 2-year bond?
- b. (10 points) What should be the current price for the 3-year bond?
- c. (10 points) What is the current yield to the 3-year bond?

******* END OF THE EXAM *******