HE1002 Macroeconomics I

Final Practice Examination 2 – Problems

Academic Year 2025/2026, Semester 1

Quantitative Research Society @NTU

November 14, 2025

Examination Instructions

Time Allowed: 120 minutes (2 hours)

Total Marks: 100

Answer Requirements:

There is a total of 4 questions. Answer all the questions.

- **Question 1** consists of 15 calculation questions. 2 marks each, total 30 marks. Please state the formula used and show your working.
- **Question 2** consists of 10 short-answer questions. 3 marks each, total 30 marks. Each answer is expected to be around 4 to 5 lines (or 2 to 3 sentences) long.
- **Question 3** consists of 10 true or false questions. 3 marks each, total 30 marks. Please clearly explain your reasoning for both true and false statements. Each answer is expected to be around 4 to 5 lines (or 2 to 3 sentences) long.
- **Question 4** consists of 2 diagram-related questions. 5 marks each, total 10 marks.

Additional Instructions:

- There are NO MCQ questions.
- Bring a calculator.
- It is a closed-book examination.
- Write all answers in the answer booklet provided.
- Show all working for calculations.

Question 1: Calculations (30 marks)

Answer all 15 questions. Each question carries 2 marks. Show all formulas and working.

1.1 *[Adapted from T01-Q02]*
Production values: Farmer sells wheat for \$100, Miller processes wheat and sells flour for \$300, Baker produces bread and sells for \$600.
Calculate total GDP using the value-added method.

1.2 *[Adapted from T01-Q09]*
An economy has: Consumption = \$8,000, Investment = \$2,500, Government purchases = \$1,800, Exports = \$900, Imports = \$1,200.
Calculate GDP.

1.3 *[Adapted from T02-Q04]*
In 2023, the average price of a basket was \$180. In 2024, the same basket cost \$198. The base year CPI (2023) is 100.
Calculate the inflation rate from 2023 to 2024.

1.4 *[Adapted from T02-Q07]*
A nominal interest rate is 6% and the inflation rate is 2%.
Calculate the real interest rate using the Fisher equation.

1.5 *[Adapted from T03-Q03]*
International data (thousands): Country has Working-age population = 85,000, Labor force = 42,500, Employed = 40,250.
Calculate:

(a) Unemployment rate
(b) Labor force participation rate

1.6 *[Adapted from T04-Q02]*
Country data: Nominal GDP growth = 10%, Inflation = 4%, Population growth = 1.5%.
Calculate real GDP per capita growth rate.

1.7 *[Adapted from T04-Q09]*
Growth accounting: Output growth = 5%, Capital growth = 3%, Labor growth = 2%, Capital share $\alpha = 0.35$.
Calculate total factor productivity (TFP) growth.

1.8 *[Adapted from T05-Q06]*
Given: Consumption function $C = 500 + 0.8(Y - T)$, $I = 800$, $G = 400$, $T = 300$, $NX = 100$.
Calculate equilibrium output.

1.9 *[Adapted from T05-Q16]*

Economy has MPC = 0.75 and faces a recessionary gap of $400 billion.
Calculate the required increase in government spending to close the gap.

1.10 *[Adapted from T06-Q13]*
The price level increases by 5%, real GDP increases by 3%.
Calculate the percentage change in nominal GDP.

1.11 *[Adapted from T07-Q07]*
MPC = 0.80. Calculate how much government spending must increase to raise output by $500 billion.

1.12 *[Adapted from T08-Q08]*
Loanable funds: Supply $S = 200 + 10r$, Demand $I = 500 - 20r$.
Calculate equilibrium interest rate and quantity of funds.

1.13 *[Adapted from T09-Q08]*
Initial deposit of $5,000 with reserve ratio of 0.20.
Calculate the maximum total money supply created by the banking system.

1.14 *[Adapted from T10-Q21]*
Phillips curve: $\pi = 3\% - 0.5(u - 5\%)$. Unemployment rate is 4%.
Calculate the inflation rate.

1.15 *[Adapted from T12-Q02]*
U.S. data: GDP = $20,000B, C = $12,000B, G = $4,000B, I = $3,000B, T = $3,500B.
Calculate:

(a) Net exports (NX)
(b) Net capital outflow (NCO)

Question 2: Short Answer (30 marks)

Answer all 10 questions. Each question carries 3 marks. Each answer should be 4-5 lines (2-3 sentences).

2.1 *[Adapted from T01-Q01]*
What is the value-added method of calculating GDP? Why does it avoid double-counting?

2.2 *[Adapted from T02-Q06]*
Why does the CPI tend to overstate the true increase in cost of living?

2.3 *[Adapted from T03-Q10]*
How do unemployment insurance benefits affect the duration of unemployment? Explain the trade-off policymakers face.

2.4 *[Adapted from T04-Q05]*
Why is human capital (education and skills) important for economic growth? Provide one example.

2.5 *[Adapted from T05-Q11]*
Why is the actual expenditure multiplier in reality smaller than the simple theoretical multiplier $1/(1 - MPC)$?

2.6 *[Adapted from T06-Q10]*
What causes the short-run aggregate supply curve to shift? Give two examples.

2.7 *[Adapted from T07-Q03]*
Explain how a government budget deficit affects the loanable funds market and interest rates.

2.8 *[Adapted from T08-Q02]*
What is the difference between foreign direct investment (FDI) and foreign portfolio investment (FPI)?

2.9 *[Adapted from T09-Q04]*
How do open market operations by the Federal Reserve affect the money supply?

2.10 *[Adapted from T10-Q06]*
What is the natural rate of unemployment (NAIRU)? Why can't unemployment fall below this rate permanently?

Question 3: True or False (30 marks)

Answer all 10 questions. Each question carries 3 marks. State whether each statement is TRUE or FALSE and explain your reasoning in 4-5 lines (2-3 sentences).

3.1 *[Adapted from T01-Q08]*
Statement: If you purchase a newly constructed house, it counts as investment in GDP, not consumption.

3.2 *[Adapted from T02-Q09]*
Statement: If your nominal wage increases by 5% and inflation is 3%, your real wage has increased by approximately 2%.

3.3 *[Adapted from T03-Q09]*
Statement: Generous unemployment benefits increase the natural rate of unemployment.

3.4 *[Adapted from T04-Q10]*
Statement: Countries with higher saving rates always have higher economic growth rates.

3.5 *[Adapted from T05-Q08]*
Statement: An increase in consumer confidence shifts the consumption function upward, increasing output in the short run.

3.6 *[Adapted from T06-Q15]*
Statement: A negative supply shock (such as an oil price increase) shifts both the short-run and long-run aggregate supply curves to the left.

3.7 *[Adapted from T07-Q12]*
Statement: If the government increases spending and taxes by the same amount, aggregate demand will increase.

3.8 *[Adapted from T08-Q12]*
Statement: Higher interest rates increase the opportunity cost of holding money.

3.9 *[Adapted from T10-Q09]*
Statement: If the central bank wants to reduce inflation, it should decrease the money supply, which will increase interest rates and reduce aggregate demand.

3.10 *[Adapted from T12-Q15]*
Statement: Under a floating exchange rate, expansionary monetary policy is more effective than under a fixed exchange rate.

Question 4: Diagrams (10 marks)

Answer both questions. Each question carries 5 marks.

4.1 *[Adapted from T06-Q19]* **(5 marks)**

The economy is in long-run equilibrium when world oil prices suddenly triple, creating a negative supply shock.

(a) Draw an AD-AS diagram showing the initial long-run equilibrium.
(b) Show the immediate effect of the oil price shock on your diagram.
(c) Describe what happens to output, unemployment, and the price level.
(d) If the government does not intervene, explain how the economy returns to long-run equilibrium.

4.2 *[Adapted from T05-Q14]* **(5 marks)**

An economy is producing below potential output (recessionary gap of \$200 billion). The marginal propensity to consume is 0.75.

(a) Draw a Keynesian cross (45-degree diagram) showing the current equilibrium with planned aggregate expenditure below potential output.
(b) Calculate the required increase in government spending to close the gap.
(c) Show on your diagram how the increase in government spending shifts the planned aggregate expenditure curve.
(d) Explain the multiplier process that occurs.

END OF EXAMINATION

Total: 100 marks
Time: 120 minutes

All questions adapted from HE1002 Tutorial Problem Sheets 1–12