Midterm Exam **U2034 Macroeconomics** **2020/4/21**

※ 本題目卷不需繳回，可用中文或英文回答 ※

Part I (40%) – Multiple choice problems – choose only one best answer to each question. Put your answers into the boxes below, and move these answers to the answer sheet.

Question	1	2	3	4	5	6	7	8	9	10
Answer	C	C	A	D	B/C	A	A	A	D	D

請將選擇題答案，以表格方式（如上所示），抄至答案卷

1) The *FE* line shows the level of output at which the _____ market is in equilibrium.
A) Goods B) Asset C) Labor D) Money

2) Which of the following would shift the *FE* line to the left?
A) A beneficial supply shock B) An increase in labor supply C) A decrease in the capital stock
D) A decrease in the future marginal productivity of capital

3) At a given output level, a temporary reduction in government purchases will
A) increase desired national saving, causing the *IS* curve to shift down and to the left.
B) increase desired national saving, causing the *IS* curve to shift up and to the right.
C) decrease desired national saving, causing the *IS* curve to shift down and to the left.
D) decrease desired national saving, causing the *IS* curve to shift up and to the right.

4) An adverse supply shock would directly _____ labor productivity by changing the amount of output that can be produced with any given amount of capital and labor. It would also indirectly _____ average labor productivity through changes in the level of employment.
A) increase; increase B) increase; decrease C) decrease; increase D) decrease; decrease

5) The Solow residual is
A) the waste from the production process.
B) the most common measure of productivity shocks.
C) a measure of the efficiency of the production process.
D) a measure of the proportion of involuntarily unemployed workers.

6) When, because of hiring and firing costs, firms retain workers in a recession that they would otherwise lay off, there is said to be
A) labor hoarding. B) a decline in capacity utilization. C) voluntary unemployment.
D) involuntary unemployment.

7) Short-run aggregate supply is greater than long-run aggregate supply in the misperceptions theory if
A) the actual price level is greater than the expected price level.
B) the actual price level equals the expected price level.
C) the actual price level is less than the expected price level.
D) output is less than its full-employment level.

8) In setting the price of its product, a monopolistic competitor sets the price equal to its marginal cost plus an amount called the _____
A) markup. B) profit. C) rent. D) menu cost.

9) According to the misperceptions theory, an unanticipated decrease in the money supply shifts the *AD* curve _____, causing output to _____ in the short run.
A) up and to the right; rise B) up and to the right; fall C) down and to the left; rise
D) down and to the left; fall

10) According to classical economists, unemployment rises in recessions due to an increase in _____ unemployment, not _____ unemployment.
A) cyclical; frictional and structural B) frictional and cyclical; structural
C) structural; frictional and cyclical D) frictional and structural; cyclical

Part II – Numerical and conceptual problems

Question 1 (25%)

The following are from both country A and country B

- Desired consumption: $C^d = 10 + 0.75(Y - T) - 80r$
- Government purchases: $G = 20$
- Taxes: $T = 20$
- Real money demand: $L = 0.8Y - 80r$
- Nominal money supply: $M = 320$
- Full-employment output: $\bar{Y} = 64$

The levels of desired investment (I^d) are different between the two countries:

- I^d in country A (I_A^d): $I_A^d = 15 - 20r$
- I^d in country B (I_B^d): $I_B^d = 15 - 55r$

(a) (5%) Separately derive the equations of the aggregate demand (AD) curve for countries A and B. Your steps should start with finding IS and LM equations.

(b) (5%) Suppose that the short-run aggregate supply curve (SRAS) indicates that $P = 10$, what are the short-run equilibrium values of output, real interest rate, consumption, and investment in both countries? Illustrate your answers, using AD/AS diagram, in Figure A for country A, and in Figure B for country B.

(c) (5%) What are the long-run equilibrium values of price, real interest rate, consumption, and investment in both countries? Illustrate your answers, using AD/AS diagram, in Figures A and B from part (b).

(d) (10%) Continue from part (b) and only focus on SHORT RUN when $P = 10$. Now, assume that the governments in both countries increase their purchases from 20 to 40, which country's fiscal policy is more effective in raising output? Explain your answer in relation to fiscal multipliers.

(a) Goods market equilibrium: $Y = C^d + I^d + G$.

For country A: $Y = [10 + 0.75(Y - 20) - 80r] + [15 - 20r] + [20]$

➔ $\mathbf{100r = 30 - 0.25Y}$ … $\text{IS}^{\text{A}}(G = 20)$

For country B: $Y = [10 + 0.75(Y - 20) - 80r] + [15 - 55r] + [20]$

➔ $\mathbf{135r = 30 - 0.25Y}$ … $\text{IS}^{\text{B}}(G = 20)$, which is "flatter" than $\text{IS}^{\text{A}}(G = 20)$

Asset market equilibrium: $\frac{M}{P} = L$

For countries A and B: $\frac{320}{P} = 0.8Y - 80r$ ➔ $\mathbf{80r = 0.8Y - \frac{320}{P}}$ … $\text{LM}^{\text{A}} = \text{LM}^{\text{B}}$

Combine: $\begin{cases} \mathbf{100r = 30 - 0.25Y} \\ \mathbf{80r = 0.8Y - \frac{320}{P}} \end{cases}$ ➔ we have $\boldsymbol{Y = 24 + \frac{320}{P}}$ … $\text{AD}^{\text{A}}(G = 20)$

Combine: $\begin{cases} \mathbf{135r = 30 - 0.25Y} \\ \mathbf{80r = 0.8Y - \frac{320}{P}} \end{cases}$ ➔ we have $\boldsymbol{Y = 18.75 + \frac{337.5}{P}}$ … $\text{AD}^{\text{B}}(G = 20)$

(b) When $P = 10$ in the short run, we can use $\text{AD}^{\text{A}}(G = 20)$ and $\text{AD}^{\text{B}}(G = 20)$ to find short-run equilibrium as follows.

For country A: $Y = 56$ ➔ from $\text{IS}^{\text{A}}(G = 20)$ we can get $r = 0.16,\ C^d = 24.2,\ I^d = 11.8$

For country B: $Y = 52.5$ ➔ from $\text{IS}^{\text{B}}(G = 20)$ we can get $r = 0.125,\ C^d = 24.375,\ I^d = 8.125$

(c) In the long run, both countries will be in full employment so $Y = \bar{Y} = 64$. From AD equation:

For country A: $P = 8$.

When $Y = \bar{Y} = 64$ ➔ from $\text{IS}^{\text{A}}(G = 20)$ we can get $r = 0.14,\ C^d = 31.8,\ I^d = 12.2$

For country B: $P = \frac{337.5}{45.25} \approx 7.46$

When $Y = \bar{Y} = 64$ ➔ from $\text{IS}^{\text{B}}(G = 20)$ we can get $r \approx 0.10,\ C^d \approx 34.7,\ I^d \approx 9.3$

(d) When $G = 40$, we can repeat part (a) to have:

For country A: $Y = [10 + 0.75(Y - 20) - 80r] + [15 - 20r] + [40]$

➔ $\mathbf{100r = 50 - 0.25Y}$ … $\text{IS}^{\text{A}}(G = 40)$ ➔ $\boldsymbol{Y = 40 + \frac{320}{P}}$ … $\text{AD}^{\text{A}}(G = 40)$

For country B: $Y = [10 + 0.75(Y - 20) - 80r] + [15 - 55r] + [40]$

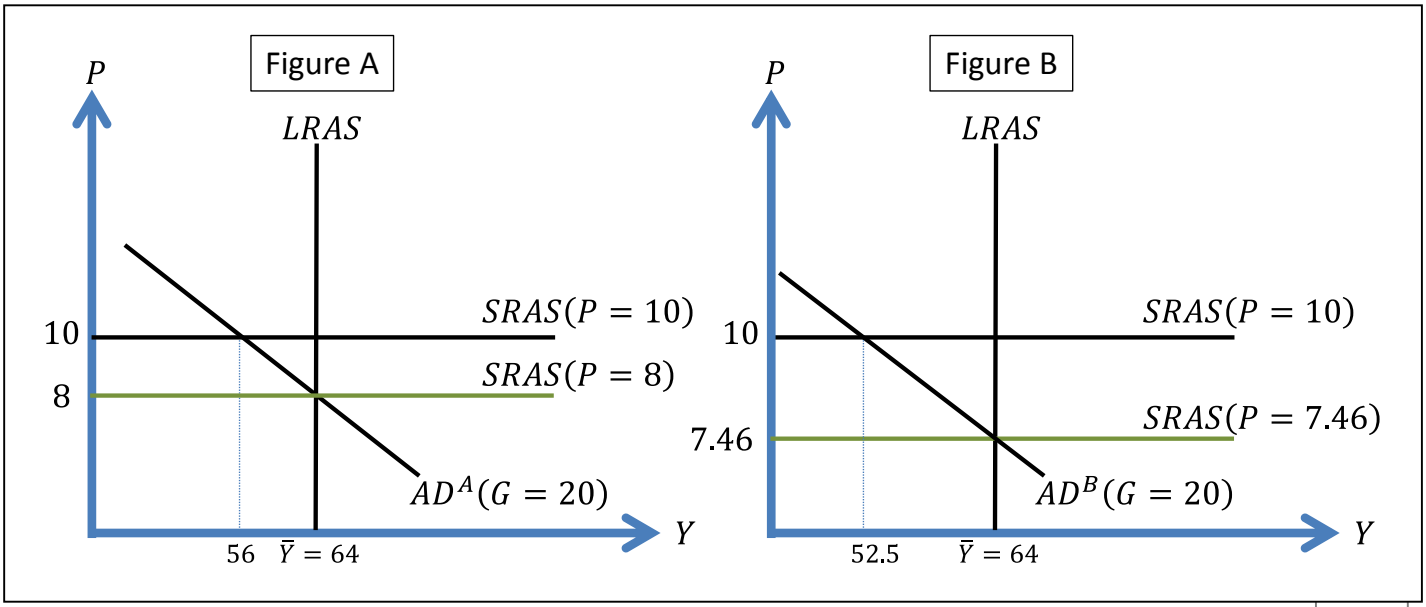
➔ $\mathbf{135r = 50 - 0.25Y}$ … $\text{IS}^{\text{B}}(G = 40)$ ➔ $\boldsymbol{Y = 31.25 + \frac{337.5}{P}}$ … $\text{AD}^{\text{B}}(G = 40)$

When $P = 10$ in the short run, we can use $\text{AD}^{\text{A}}(G = 40)$ and $\text{AD}^{\text{B}}(G = 40)$ to find short-run equilibrium outputs as follows:

For country A: $Y = 72$ ➔ $\Delta Y = 72 - 56 = 16$ ➔ fiscal multiplier $= \frac{\Delta Y}{\Delta G} = \frac{72-56}{40-20} = 0.8$

For country B: $Y = 65$ ➔ $\Delta Y = 65 - 52.5 = 12.5$ ➔ fiscal multiplier $= \frac{\Delta Y}{\Delta G} = \frac{65-52.5}{40-20} = 0.625$

In country A, fiscal policy is more effective in raising output.



Question 2 (15%)

What is the neutrality of money? From Keynesians' and Classicals' viewpoints, is money neutral in the short and long run? Discuss "in detail" for getting full marks.

The neutrality of money (from CH10): a change in the nominal money supply changes the price level proportionately but has no effect on real variables.

- Keynesians: money is neutral only in the long run. In the short run, price level is sticky so a change in the nominal money supply does affect real output and interest rate.
- Classicals:
  - (1) without "misperception theory", price level is fully flexible so money is neutral in both short and long run.
  - (2) with "misperception theory":
    - An unanticipated change in nominal money supply: people haven't changed their expected price, money is not neutral in the short-run. In the long run, people adjust their expected price so money is neutral.
    - An anticipated change in nominal money supply: people change their expected price instantly so money is neutral in both short and long run.

Question 3 (20%)

2020 年初期全球大流行的新型冠狀病毒，造成世界主要國家面臨到衰退性的供給面以及需求面衝擊，請分析這些先進國家在 2020 年即將統計的實質產出 (Y)、就業量 (N)、實質工資 (w)、實質利率 (r)、以及物價水準 (P) 的增減。在分析過程中，請繪製必要的圖形。

(1) Figure 1 可以看到負面的供給面衝擊，所帶來的勞動需求 (ND) 減少，就業量 $(\bar{N})$ 下降，使得產出 $(\bar{Y})$ 減少。實質工資 (w) 的部分因學派而異，同學們僅需以某一學派觀點回答即可。以 Figure 1 的古典學派觀點來舉例，均衡工資會下降。但若以凱因斯學派的效率工資理論來說，效率工資可能會僵固在市場均衡工資以上的位置，使得短期實質工資不變，或者僅有些微降幅。

(2) Figure 2 可以看到，勞動市場的 $\bar{Y}$ 下降，FE 及 LRAS 左移。負面的需求面衝擊，導致人們的消費投資信心下降，IS 左移的結果，AD 也會左移。最終結果是，實質利率 (r) 必然下降，但**物價水準 (P) 的改變方向，端看 LRAS 與 AD 左移的幅度而定，這也是本題最核心的結果**。Figure 2 舉的例子是物價 (P) 不改變，同學可以自行繪製物價上升或下降的圖形，並注意 LM 會因物價上升或下降，而左移或右移。

(3) 在 Figure 2 中，同學也可以反向思考，若政府用擴張性貨幣政策，例如美國的無限 QE，會使 LM 右移，實質利率下降得更多，且 AD 也會呈現右移的力道，最後導致 AD 不會左移這麼多，甚至可能右移，但最終來看，實質利率 (r) 是必然下跌的，而且無限 QE 的結果，自然導致實質利率為零，甚至負實質利率的出現。