Past-paper walk-through

Long-Run Aggregate Supply (LRAS) ▪ 3.4

eXercise

Questions in this set

- 2026 Q1
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Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- // separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = "or words to that effect" – the wording need not match.

Question 1

2026 ▪ Q1

The economy of Micanapy is in short-run equilibrium and is experiencing an inflationary gap.

(a)(i) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Micanapy, and show each of the following.

The current equilibrium real output and price level, labeled Y_1 and PL_1, respectively.

(a)(ii) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Micanapy, and show each of the following.

The full-employment real output, labeled Y_F.

Question 1

2026 ▪ Q1

The economy of Micanapy is in short-run equilibrium and is experiencing an inflationary gap.

(b) Assume that policymakers take no action to close the inflationary gap. Explain how Micanapy's economy will self-adjust to full employment in the long run.

Question 1

2026 ▪ Q1

The economy of Micanapy is in short-run equilibrium and is experiencing an inflationary gap.

(c)(i) Suppose instead that Micanapy's central bank is considering using monetary policy to close the inflationary gap in the short run. The banking system in Micanapy has limited reserves.

Identify a specific open-market operation that the central bank of Micanapy would implement to close the inflationary gap in the short run.

(c)(ii) Draw a correctly labeled graph of the money market in Micanapy, and show the effect of the open-market operation identified in part C (i) on the nominal interest rate.

Question 1

2026 ▪ Q1

The economy of Micanapy is in short-run equilibrium and is experiencing an inflationary gap.

(d)(i) Based solely on the interest rate change shown on your graph in part C (ii), will each of the following increase, decrease, or remain the same in the short run?
International financial capital flows into Micanapy. Explain.

(d)(ii) Based solely on the interest rate change shown on your graph in part C (ii), will each of the following increase, decrease, or remain the same in the short run?
The price of previously issued bonds in Micanapy.

(d)(iii) Based solely on the interest rate change shown on your graph in part C (ii), will each of the following increase, decrease, or remain the same in the short run?
Private domestic investment spending in Micanapy.

Question 1

2026 ▪ Q1

The economy of Micanapy is in short-run equilibrium and is experiencing an inflationary gap.

(e) Based solely on the change in private domestic investment spending identified in part D (iii), will the unemployment rate in Micanapy increase, decrease, or remain the same in the short run? Explain.

Question 3

2025 Set 1 ▪ Q3

3. The table provided shows the quantities and unit prices of shirts, bread, and pants, the only three goods produced in the country of Middleland in 2021 and 2022. Assume that 2021 was the base year.

	Shirts	Bread	Pants
Unit Prices in 2021	$11	$4	$12
Unit Prices in 2022	$10	$5	$15
Quantities Produced in 2021 and 2022	50	70	30

Question 3

A. Was the real GDP in 2021 in Middleland greater than, less than, or equal to the nominal GDP in 2021? Explain.

B. Calculate the real GDP in Middleland in 2022. Show your work.

C. Assume that Middleland was in short-run equilibrium in 2022 and that POTENTIAL real GDP was $1,150 in 2022. Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Middleland in 2022, and show each of the following.

i. The equilibrium real output and price level, labeled Y_1 and PL_1, respectively

ii. The full-employment output, labeled Y_F

D. Assume the marginal propensity to consume in Middleland is 0.8. Calculate the minimum change and state the direction of change in government spending required to close the output gap in the short run in Middleland. Show your work.

Question 3

STOP

END OF EXAM

Solution 3

(a)

Mark scheme

- Real GDP in 2021 was EQUAL to nominal GDP in 2021. Because 2021 is the base year, the price level has not changed relative to itself, and real values always equal nominal values in the base year. 1 point.

Solution 3

(b)

Mark scheme

- Real GDP in Middleland in 2022 = $1,190 (2021 \textit{base} - \textit{yearpricesappliedto} 2022 \textit{quantities})$. *Work* : *RealGDP* = (11 × 50) + (4×70) + (12 × 30) = 550+280 + 360 =1,190. 1 point for the calculation with work shown.

Solution 3

(c)

Mark scheme

- This line is only the stem instructing the student to draw the AD/SRAS/LRAS graph for 2022 and 'show each of the following'; it has no independently scorable content beyond what is graded in C(i) and C(ii).

Solution 3

(c)(i)

Mark scheme

- Draw a correctly labeled aggregate demand–aggregate supply graph (Price Level on the vertical axis, Real GDP on the horizontal axis) with a downward-sloping AD curve and an upward-sloping SRAS curve intersecting at the equilibrium point, labeling the equilibrium price level PL_1 and equilibrium real output Y_1. 1 point.

Solution 3

(c)(ii)

Mark scheme

- On the same graph, add a vertical long-run aggregate supply (LRAS) curve positioned to the LEFT of Y_1 (since 2022 short-run output $Y_1 = 1,190 exceeds potential real GDP of 1,150$), and label the full-employment output on the LRAS curve as Y_F. 1 point.

Solution 3

(d)

Mark scheme

- Minimum change in government spending = a DECREASE of \$8. Work: Output Gap = Potential GDP − Actual 2022 Real GDP = \$1,150 − \$1,190 = −\$40. Spending multiplier = 1/(1−MPC) = 1/(1−0.8) = 5. Minimum ΔG = Output Gap ÷ Multiplier = −\$40 ÷ 5 = −\$8 (government spending must decrease by \$8 to close the inflationary output gap). 1 point for the calculation with work shown.

Question 3

2025 Set 2 ▪ Q3

Assume that Nepal is in long-run macroeconomic equilibrium and has an open economy.

(a)(i) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Nepal, and show each of the following. The current equilibrium real output and price level, labeled Y_1 and PL_1, respectively

(a)(ii) The full-employment output, labeled Y_F

Question 3

2025 Set 2 ▪ Q3

Assume that Nepal is in long-run macroeconomic equilibrium and has an open economy.

(b) Nepal and Thailand are trading partners. Assume that Thailand experiences an increase in real income. On your graph in part A, show the short-run effect of the increase in real income in Thailand on real output and the price level in Nepal, labeling the new short-run equilibrium real output Y_2 and the new short-run equilibrium price level PL_2.

Question 3

2025 Set 2 ▪ Q3

Assume that Nepal is in long-run macroeconomic equilibrium and has an open economy.

(c) Assume that at the short-run equilibrium shown on your graph in part B, Nepal is experiencing a 400 million rupee output gap. Policymakers in Nepal want to use discretionary fiscal policy to return the economy to full employment, and the marginal propensity to consume is 0.75. Calculate the minimum change and state the direction of change in government spending required to completely close the output gap in the short run. Show your work.

Question 3

2025 Set 2 ▪ Q3

Assume that Nepal is in long-run macroeconomic equilibrium and has an open economy.
(d) Assume instead that no discretionary policy actions are taken. Explain how automatic stabilizers in the short run would reduce the effect of the change in real output shown on your graph in part B.

Solution 3

(a)(i)

Mark scheme

- Draw a graph with Price Level on the vertical axis and Real GDP on the horizontal axis: a downward-sloping aggregate demand curve AD1 and an upward-sloping short-run aggregate supply curve SRAS1, intersecting at equilibrium price level PL1 and equilibrium real output Y1.

Solution 3

(a)(ii)

Mark scheme

- On the same graph, add a vertical long-run aggregate supply curve (LRAS) at the full-employment output, labeled Y_F, positioned at the same real output as Y1 (i.e., Y1 = Y_F), showing the economy currently at long-run equilibrium.

Solution 3

(b)

Mark scheme

- On the same graph, shift the aggregate demand curve rightward from AD1 to AD2: the increase in real income in Thailand (a trading partner) increases demand for Nepal's exports, increasing Nepal's net exports and aggregate demand. This raises the new short-run equilibrium real output to Y2 (labeled to the right of Y1 = Y_F) and raises the new short-run equilibrium price level to PL2 (labeled above PL1), at the intersection of AD2 and SRAS1.

Solution 3

(c)

Mark scheme

- Spending multiplier = 1 / (1 - MPC) = 1 / (1 - 0.75) = 4. Minimum change in government spending = -(output gap) / multiplier = -400 million rupees / 4 = -100 million rupees. Because the economy is at Y2 > Y_F (an inflationary/positive output gap of 400 million rupees, per part B), government spending must DECREASE by a minimum of 100 million rupees to close the gap and return output to Y_F.

Solution 3

(d)

Mark scheme

- Without discretionary policy action, automatic stabilizers reduce the effect of the increase in real output shown in part B: as real income (output) rises, tax revenues automatically increase and/or transfer payments automatically decrease. This slows the rate at which disposable income rises, which slows the growth of consumption spending, dampening the rightward shift of aggregate demand and the resulting increase in real GDP and the price level.

Question 1

2024 Set 2 ▪ Q1

Assume that the economy of Moneyland is in equilibrium with an actual unemployment rate equal to the natural rate of unemployment.

(a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.

(a)(i) The current equilibrium real output and price level, labeled Y_1 and PL_1, respectively

(a)(ii) The full employment output, labeled Y_F

Question 1

2024 Set 2 ▪ Q1

Assume that the economy of Moneyland is in equilibrium with an actual unemployment rate equal to the natural rate of unemployment.

(b) Assume that consumer spending in Moneyland decreases from \$110,000 to \$100,000 as a result of a decrease in disposable income in Moneyland from \$135,000 to \$110,000.

(b)(i) Calculate the marginal propensity to consume in Moneyland. Show your work.

(b)(ii) Show the short-run effect of the decrease in consumer spending in Moneyland on your graph in part (a), labeling the new equilibrium real output and price level Y_2 and PL_2, respectively.

Question 1

2024 Set 2 ▪ Q1

Assume that the economy of Moneyland is in equilibrium with an actual unemployment rate equal to the natural rate of unemployment.

(c) Following the decrease in consumer spending, explain how the economy would adjust in the long run in the absence of any policy actions.

Question 1

2024 Set 2 ▪ Q1

Assume that the economy of Moneyland is in equilibrium with an actual unemployment rate equal to the natural rate of unemployment.

(d) The central bank of Moneyland is concerned about the short-run effects of the decrease in consumer spending on the broader economy and is considering taking action rather than waiting for the long-run adjustment process. Assuming the banking system in Moneyland has ample reserves, identify a specific monetary policy action the central bank of Moneyland would take to increase consumer spending.

Question 1

2024 Set 2 ▪ Q1

Assume that the economy of Moneyland is in equilibrium with an actual unemployment rate equal to the natural rate of unemployment.

(e) Draw a correctly labeled graph of the reserve market in Moneyland, and show the effect of the monetary policy action identified in part (d) on the policy rate.

Question 1

2024 Set 2 ▪ Q1

Assume that the economy of Moneyland is in equilibrium with an actual unemployment rate equal to the natural rate of unemployment.

(f) How would the change in the policy rate shown on your graph in part (e) affect each of the following in Moneyland in the short run?

(f)(i) The quantity of national savings

(f)(ii) Unemployment. Explain.

Solution 1

(a)

Mark scheme

- Setup instruction only (no independent points) — draw one AD–SRAS–LRAS diagram with Price Level on the vertical axis and Real GDP on the horizontal axis, showing a downward-sloping AD_1 curve and an upward-sloping $SRAS_1$ curve. The two scored elements are given in (a)(i) and (a)(ii).

Solution 1

(a)(i)

Mark scheme

- Label the intersection of AD_1 and $SRAS_1$: drop dashed lines to the axes to show equilibrium price level PL_1 (vertical axis) and equilibrium real output Y_1 (horizontal axis) at that intersection.

(a)(ii)

Mark scheme

- Add a vertical long-run aggregate supply curve (LRAS) positioned exactly at the $AD_1/SRAS_1$ intersection — i.e., at Y_1 — and label it Y_F, showing $Y_1 = Y_F$ (the economy begins at full-employment/potential output).

Solution 1

(b)

Mark scheme

- Stem/data only — consumer spending in Moneyland falls from \$110,000 to \$100,000 as disposable income falls from \$135,000 to \$110,000. Scored in (b)(i) and (b)(ii) below.

Solution 1

(b)(i)

Mark scheme

- $MPC = \dfrac{\Delta\text{Consumer Spending}}{\Delta\text{Disposable Income}} = \dfrac{\$100{,}000 - \$110{,}000}{\$110{,}000 - \$135{,}000} = \dfrac{-\$10{,}000}{-\$25{,}000} = 0.4.$
  Award the point for showing this calculation and arriving at $MPC = 0.4$.

Solution 1

(b)(ii)

Mark scheme

- On the graph from part (a), shift the AD curve leftward from AD_1 to AD_2 (a fall in consumer spending is a fall in aggregate demand). The new AD_2 curve intersects $SRAS_1$ at a lower price level, labeled PL_2 (with $PL_2 < PL_1$), and lower real output, labeled Y_2 (with $Y_2 < Y_1 = Y_F$).

Solution 1

(c)

Mark scheme

- Because Y_2 is below full-employment output Y_F, the economy has a recessionary (negative) output gap with higher-than-natural unemployment. This puts downward pressure on input prices (e.g., nominal wages) and/or lowers inflationary expectations, so short-run aggregate supply increases (SRAS shifts rightward) over time. SRAS keeps shifting right until it re-intersects AD_2 at Y_F, restoring full-employment equilibrium at a lower price level — the economy self-corrects without policy action.

Solution 1

(d)

Mark scheme

- The central bank should use expansionary monetary policy. Since the banking system has ample reserves, an open-market purchase would not move the policy rate; instead the central bank should decrease an administered rate — e.g., decrease the interest rate paid on reserve balances (interest on reserves), or decrease the discount rate — to pull the policy/floor rate down and lower the cost of borrowing, increasing consumer spending.

Solution 1

(e) Mark scheme

- Draw a reserve-market graph with Policy Rate on the vertical axis and Quantity of Reserves on the horizontal axis: a vertical reserve supply curve S_R in the ample-reserves range intersects the kinked demand curve D_R (downward-sloping then flat) on its flat segment, at quantity Q_1 and initial policy rate PR_1 (1 point). For the second point, show the effect of the monetary action from part (d): shift the flat (administered-rate) segment of D_R downward, so the new intersection with S_R occurs at the same quantity Q_1 but a lower policy rate $PR_2 < PR_1$ (a decrease in the lower bound of the demand curve for reserves, or equivalently a downward shift of the administered rate, lowers the policy rate).

Solution 1

(f)

Mark scheme

- Stem only — asks for the short-run effect of the lower policy rate from part (e) on (i) the quantity of national savings and (ii) unemployment. Scored in (f)(i) and (f)(ii) below.

Solution 1

(f)(i)

Mark scheme

- The quantity of national savings would decrease. A lower policy/interest rate reduces the return to saving, so households and firms choose to save less (equivalently, in the loanable funds market a lower interest rate corresponds to a lower quantity of national savings supplied).

Solution 1

(f)(ii)

Mark scheme

- Unemployment would decrease. Explanation: the decrease in the policy rate lowers nominal (and real) interest rates, which increases interest-sensitive spending — consumption (e.g., durable goods bought on credit), investment (business borrowing for capital), and/or net exports (via currency depreciation). This raises aggregate demand and real output, moving the economy back toward/beyond full employment and lowering the unemployment rate.

Question 3

2023 Set 2 ▪ Q3

Assume that the economy of country Zen is in long-run macroeconomic equilibrium.
(a)(i) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
The current equilibrium real output and price level, labeled Y_1 and PL_1, respectively
(a)(ii) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
The full-employment output, labeled Y_F

Question 3

2023 Set 2 ▪ Q3

Assume that the economy of country Zen is in long-run macroeconomic equilibrium.

(b) On your graph in part (a), show the short-run effect of an increase in consumer confidence. Label the new equilibrium real output Y_2 and the new equilibrium price level PL_2.

Question 3

2023 Set 2 ▪ Q3

Assume that the economy of country Zen is in long-run macroeconomic equilibrium.

(c) Assume that the banking system in Zen has ample reserves. Suppose that the central bank's goal is to maintain a stable price level at PL_1. Based on the change in the price level shown in part (b), identify one specific monetary policy action the central bank would take to achieve its goal.

Question 3

2023 Set 2 ▪ Q3

Assume that the economy of country Zen is in long-run macroeconomic equilibrium.

(d) Based on the monetary policy action identified in part (c), will real output increase, decrease, or stay the same in the short run? Explain.

Solution 3

(a)(i)

Mark scheme

- Graph with Price Level on the vertical axis and Real GDP on the horizontal axis, showing a downward-sloping aggregate demand curve (AD_1) and an upward-sloping short-run aggregate supply curve ($SRAS_1$) intersecting at the current equilibrium, with the equilibrium price level labeled PL_1 and the equilibrium real output labeled Y_1; all curves and axes correctly labeled.

Solution 3

(a)(ii)

Mark scheme

- A vertical long-run aggregate supply curve (LRAS) is added to the same graph directly above the equilibrium real output, so that $Y_1 = Y_F$, showing the economy is currently producing at full-employment output.

Solution 3

(b)

Mark scheme

- On the AD–SRAS–LRAS graph from part (a), shift the aggregate demand curve rightward ($AD_1 \rightarrow AD_2$) to reflect the increase in consumer confidence (higher consumption spending). The new short-run equilibrium has a higher real output, labeled Y_2 (with $Y_2 > Y_1 = Y_F$), and a higher price level, labeled PL_2 (with $PL_2 > PL_1$).

Solution 3

(c)

Mark scheme

- The central bank would take a contractionary (tight) monetary policy action to pull the price level back down to PL_1: increase its administered interest rate (e.g., raise the policy/discount rate) or increase the interest rate paid on reserves (equivalently, sell government bonds on the open market to reduce the money supply and raise interest rates).

Solution 3

(d)

Mark scheme

- Real output will decrease. Explanation: the increase in interest rates raises the cost of borrowing, which decreases interest-sensitive spending (consumption, investment, and/or net exports); this decreases aggregate demand and lowers real output back toward $Y_1 = Y_F$.

Question 1

2022 Set 1 ▪ Q1

1. Assume a country's economy is operating below full employment.

   (a) Draw a correctly labeled graph of aggregate demand, short-run aggregate supply, and long-run aggregate supply, and show each of the following.

   (i) The current equilibrium real output and price level, labeled as Y_1 and PL_1, respectively
   (ii) The full-employment output, labeled as Y_F

   (b) Identify one fiscal policy action the country's government can take to restore full employment.

   (c) Assume instead that no fiscal policy action is taken. Suppose a change in investment spending causes real GDP to increase by $\$200$ billion. Calculate the minimum change in investment spending that could have caused this increase in real GDP if the marginal propensity to save is 0.25. Show your work.

   (d) Assume the output gap was initially $\$800$ billion. On your graph in part (a), show the short-run effect of the change in investment spending identified in part (c), labeling the new equilibrium real output as Y_2 and the new equilibrium price level as PL_2.

Question 1

(e) Given your answer to part (d), is the actual rate of unemployment greater than, less than, or equal to the natural rate of unemployment? Explain.

(f) Assume that private savings now increase. Draw a correctly labeled graph of the loanable funds market and show the effect of the increase in private savings on the real interest rate.

(g) Based solely on the change in the real interest rate shown in part (f), what will happen to each of the following?

(i) Real GDP in the short run. Explain.
(ii) Long-run aggregate supply. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

Solution 1

(a)

Mark scheme

- Draw an AD-AS graph: downward-sloping AD_1, upward-sloping $SRAS_1$ (axes: Price Level vertical, Real GDP horizontal), intersecting at price level PL_1 and real output Y_1 — 1 point. Add a vertical LRAS line positioned to the right of Y_1, labeled Y_F (full-employment/potential output), showing $Y_1 < Y_F$ (a recessionary gap) — 1 point. Total 2 points for a correctly labeled graph showing both the current equilibrium (PL_1, Y_1) and full-employment output Y_F.

Solution 1

(b)

Mark scheme

- Any one expansionary fiscal policy action: an increase in government spending, a decrease in taxes, or an increase in transfer payments. 1 point for correctly identifying any one of these (each would increase aggregate demand, closing the recessionary gap and restoring full employment).

Solution 1

(c)

Mark scheme

- Minimum change in investment spending $= 200 billion \div (1/0.25)$ =200 billion $\times$ 0.25 $= 50 billion$. *Showwork* : $the spending multiplier = 1/MPS = 1/0.25 = 4; \Delta I = \Delta Y \div multiplier$ =200 billion $\div$ 4 $=$ $50 billion$. $1 point for the correct answer$(50 billion) with work shown.

Solution 1

(d)

Mark scheme

- On the graph from part (a), shift AD_1 rightward to AD_2 (reflecting the increase in investment spending), intersecting $SRAS_1$ at a new equilibrium with a higher price level PL_2 ($PL_2 > PL_1$) and higher real output Y_2 ($Y_1 < Y_2 < Y_F$ — still below full-employment output). 1 point for a correctly shown rightward AD shift with PL_2 and Y_2 labeled at the new, higher intersection that remains left of Y_F.

Solution 1

(e)

Mark scheme

- The actual rate of unemployment is greater than the natural rate of unemployment. Explanation: because Y_2 is still less than Y_F (full-employment output), the economy remains in a recessionary gap — actual output is below potential output, so actual unemployment exceeds the natural rate. 1 point for the correct comparison (actual $>$ natural) together with this explanation.

Solution 1

(f)

Mark scheme

- Draw the loanable funds market: downward-sloping demand D_{LF_1}, upward-sloping supply S_{LF_1} (axes: Real Interest Rate vertical, Quantity of Loanable Funds horizontal), equilibrium at r_1, Q_1 — 1 point. Shift the supply curve rightward ($S_{LF_1} \rightarrow S_{LF_2}$, reflecting the increase in private savings), producing a new equilibrium with a lower real interest rate r_2 ($r_2 < r_1$) and a higher quantity Q_2 — 1 point. Total 2 points.

Solution 1

(g)(i)

Mark scheme

- Real GDP will increase in the short run. Explanation: the lower real interest rate (from part f) reduces the cost of borrowing, increasing interest-sensitive spending (consumption, investment, and/or net exports), which increases aggregate demand and therefore short-run real GDP. 1 point for the correct direction (increase) with this explanation.

Solution 1

(g)(ii)

Mark scheme

- Long-run aggregate supply (LRAS) will increase. Explanation: the decrease in the real interest rate lowers the cost of borrowing, which increases investment spending on plant and equipment (capital formation); the resulting increase in the capital stock increases the economy's potential output, shifting LRAS rightward. 1 point for the correct direction (increase) with this explanation.

Question 1

2019 Set 2 ▪ Q1

Assume the economy of Artland is currently operating above full employment.
(a) Draw a correctly labeled graph of the short-run aggregate supply, long-run aggregate supply, and aggregate demand curves, and show each of the following.
(i) The current equilibrium real output and price level, labeled as Y_1 and PL_1, respectively
(ii) The full-employment output, labeled as Y_f

Question 1

2019 Set 2 ▪ Q1

Assume the economy of Artland is currently operating above full employment.

(b) Assume the central bank and the government do not take any policy actions to close the output gap.

(i) On your graph in part (a), show how the economy automatically adjusts in the long run and label the new equilibrium price level PL_2.

(ii) Explain the cause of the adjustment shown in part (b)(i).

Question 1

2019 Set 2 ▪ Q1

Assume the economy of Artland is currently operating above full employment.

(c) Alternatively, suppose the government wants to close the output gap using fiscal policy.

(i) Identify a fiscal policy action the government could implement to close the output gap.

(ii) How will the fiscal policy action identified in part (c)(i) affect the following?

- The unemployment rate
- The natural rate of unemployment

(iii) In closing the output gap, will the automatic adjustment identified in part (b)(i) produce a higher, a lower, or the same price level compared to the fiscal policy identified in part (c)(i)?

Question 1

2019 Set 2 ▪ Q1

Assume the economy of Artland is currently operating above full employment.

(d) Draw a correctly labeled graph of the market for loanable funds. Show the effect of the fiscal policy action identified in part (c)(i) on the equilibrium real interest rate.

Question 1

2019 Set 2 ▪ Q1

Assume the economy of Artland is currently operating above full employment.

(e) Given the interest rate change identified in part (d), will the long-run aggregate supply curve shift to the right, shift to the left, or remain the same in the long run? Explain.

Solution 1

(a) Mark scheme

- Draw a standard AD-AS graph: Price Level on the vertical axis, Real GDP on the horizontal axis. Draw a downward-sloping AD curve and an upward-sloping SRAS curve intersecting at the current equilibrium, labeled Y1 (output) and PL1 (price level). Add a vertical LRAS curve positioned to the LEFT of Y1, with the full-employment output labeled Yf (so $Yf < Y1$, i.e. the economy is producing beyond full employment). Full credit requires: (1) a correctly labeled AD (downward-sloping) and SRAS (upward-sloping) with equilibrium Y1 and PL1, and (2) a correctly labeled vertical LRAS with Yf to the left of Y1.

Solution 1

(b) Mark scheme

- With no policy action, output is above full employment (Y1 $>$ Yf), so tight labor/input markets push costs up over time and the SRAS curve shifts LEFTWARD (SRAS1 to SRAS2), moving the economy up along AD to a new long-run equilibrium at Yf with a HIGHER price level, labeled PL2 (PL2 $>$ PL1). Cause of the adjustment: since output exceeds the full-employment level, unemployment is below the natural rate, so rising input prices, rising nominal wages, and/or rising inflationary expectations increase production costs, shifting SRAS to the left until output returns to Yf. Full credit requires: (1) SRAS shown shifting left with PL2 drawn/labeled higher than PL1, and (2) an explanation

Solution 1

citing increased input prices, nominal wages, or inflationary expectations as the cause of the leftward SRAS shift.

Solution 1

(c) Mark scheme

- (i) A valid contractionary fiscal policy action: a decrease in government spending, a decrease in transfer payments, OR an increase in taxes (any one). (ii) Effect on unemployment: the (actual/cyclical) unemployment rate will INCREASE, because the contractionary policy reduces AD and pulls output back down toward Yf; the natural rate of unemployment will NOT CHANGE, since fiscal policy does not alter the economy's structural/frictional unemployment. (iii) Price-level comparison: the automatic adjustment identified in part (b)(i) produces a HIGHER price level than the fiscal-policy route. The automatic mechanism raises the price level to PL2 as costs/wages rise (SRAS shifts left), whereas closing the gap via contractionary fiscal policy works by reducing AD, which keeps the price

Solution 1

level lower than the automatic-adjustment outcome. Full credit requires all three components: a valid contractionary fiscal policy, unemployment rising while the natural rate stays constant, and the automatic adjustment yielding a higher price level than the fiscal-policy route.

Solution 1

(d) Mark scheme

- Draw a loanable funds market graph: Real Interest Rate on the vertical axis, Quantity of Loanable Funds on the horizontal axis, with an upward-sloping supply curve S_LF1 and a downward-sloping demand curve D_LF1 intersecting at the initial equilibrium real interest rate r1 and quantity Q1. Then show the effect of the contractionary fiscal policy from part (c)(i) (less government spending/transfer payments, or higher taxes, means a smaller budget deficit and less government borrowing): the DEMAND for loanable funds shifts LEFTWARD from D_LF1 to D_LF2 (equivalently, this can be shown as the SUPPLY of loanable funds shifting RIGHTWARD), which LOWERS the equilibrium real interest rate from r1 to a lower r2. Full credit requires: (1) a correctly labeled

Solution 1

initial loanable-funds market graph, and (2) a leftward shift in demand for loanable funds (or rightward shift in supply) that lowers the equilibrium real interest rate.

Solution 1

(e)

Mark scheme

- The LRAS curve will shift to the RIGHT in the long run. Explanation: the lower real interest rate identified in part (d) reduces the cost of borrowing, which increases investment spending on capital goods; this greater capital formation raises the economy's productive capacity (a larger capital stock), shifting LRAS to the right.

Question 3

2017 ▪ Q3

A country is at full employment and produces two types of goods: consumer goods and capital goods.

(a) Draw a correctly labeled graph of the production possibilities curve, with consumer goods on the horizontal axis and capital goods on the vertical axis. Indicate a point on your graph, labeled X, that represents full employment and a possible combination in which both goods are being produced.

(b) Assume there is an increase in the country's national savings. Draw a correctly labeled graph of the loanable funds market, showing the change in the real interest rate from the increase in savings.

(c) On the same graph from part (a), show another point, labeled Z, that represents full employment and a new combination of consumer goods and capital goods consistent with the increase in the country's national savings.

Question 3

(d) Referring to your answer to part (c), will the long-run aggregate supply curve shift to the right, shift to the left, or remain the same? Explain.

Solution 3

(a)

Mark scheme

- Draw a correctly labeled production possibilities curve (PPC), bowed outward from the origin, with consumer goods on the horizontal axis and capital goods on the vertical axis. Plot point X on the curve, representing full employment with a possible combination of both goods being produced.

Solution 3

(b)

Mark scheme

- Graph axes: real interest rate vertical, quantity of loanable funds horizontal. Draw a correctly labeled loanable funds market with a downward-sloping demand for loanable funds (D_LF) and an upward-sloping supply of loanable funds (S_LF) (1 point). Show the supply curve shifting rightward from S_LF to S'_LF (due to the increase in national savings), with the equilibrium real interest rate falling from r to r' (1 point).

Solution 3

(c)

Mark scheme

- On the same PPC graph from part (a), plot point Z to the left of point X (i.e., a combination with more capital goods and fewer consumer goods than X), representing full employment with a new production combination consistent with the increase in national savings.

Solution 3

(d)

Mark scheme

- The long-run aggregate supply (LRAS) curve will shift to the right.
  Explanation: producing more capital goods (the move to point Z) increases capital accumulation, which raises the economy's productive capacity, shifting LRAS to the right.

Question 1

2015 ▪ Q1

MACROECONOMICS
Section II
Planning Time—10 minutes
Writing Time—50 minutes

Directions: You have 10 minutes to read all of the questions in this booklet, to sketch graphs, to make notes, and to plan your answers. You will then have 50 minutes to answer all three of the following questions. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

1. Assume that the United States economy is operating below full employment.

   (a) Draw a correctly labeled graph of long-run aggregate supply, short-run aggregate supply, and aggregate demand, and show each of the following.

Question 1

(i) Current equilibrium output and price level, labeled as Y_1 and PL_1

(ii) Full-employment output, labeled as Y_f

(b) Assume that the Federal Reserve targets a new federal funds rate to reach full employment. Should the Federal Reserve target a higher or lower federal funds rate?

(c) Given the Federal Reserve action you identified in part (b), draw a correctly labeled graph of the money market and show the effect on the nominal interest rate.

(d) The policy makers pursue a fiscal policy rather than the monetary policy in part (b). Assume that the marginal propensity to consume is 0.8 and the value of the recessionary gap is $300 billion.

(i) If the government changes its spending without changing taxes to eliminate the recessionary gap, calculate the minimum required change in government spending.

(ii) If the government changes taxes without changing government spending to eliminate the recessionary gap, will the minimum required change in taxes be greater than, smaller than, or equal to the minimum required change in government spending in part (d)(i) ? Explain.

(e) Assume the government lowers income tax rates to eliminate the recessionary gap. Will each of the following increase, decrease, or stay the same?

Question 1

(i) Aggregate demand. Explain.

(ii) Long-run aggregate supply. Explain.

Solution 1

(a)

Mark scheme

- Setup/instruction for the graph — no separate credit. Draw axes with Price Level (vertical) and Real GDP (horizontal); a downward-sloping AD curve and an upward-sloping SRAS curve. Credit for this graph is earned via parts (a)(i) (initial equilibrium labels Y_1, PL_1) and (a)(ii) (LRAS placement) below.

Solution 1

(a)(i)

Mark scheme

- Label the initial equilibrium — where AD intersects SRAS — as Y_1 on the real-GDP axis and PL_1 on the price-level axis. One point is earned for a correctly labeled graph showing AD, SRAS, Y_1, and PL_1.

Solution 1

(a)(ii)

Mark scheme

- Draw a vertical long-run aggregate supply (LRAS) curve at Y_f, positioned to the right of Y_1 (the economy starts in a recessionary gap, so $Y_1 < Y_f$). One point is earned for drawing a vertical LRAS at Y_f to the right of Y_1.

Solution 1

(b)

Mark scheme

- The Federal Reserve should target a LOWER federal funds rate. A lower target rate is expansionary monetary policy, needed to close the recessionary gap ($Y_1 < Y_f$) and move the economy toward full employment. One point is earned for stating 'lower.'

Solution 1

(c)

Mark scheme

- Draw a correctly labeled money market graph: vertical axis = nominal interest rate, horizontal axis = quantity of money, with a downward-sloping money demand (MD) curve and vertical money supply curves MS_1/MS_2. To lower the federal funds rate, the Fed increases the money supply — shift MS_1 right to MS_2 (from M_1 to M_2), lowering the nominal interest rate from r_1 to r_2. One point for a correctly labeled graph; one point for shifting money supply right and showing the resulting decrease in the nominal interest rate.

Solution 1

(d)

Mark scheme

- Setup only — no separate credit. Given: MPC $= 0.8$ (so MPS $= 0.2$) and a recessionary gap of \$300 billion. These numbers are used in parts (d)(i) and (d)(ii) below.

(d)(i)

Mark scheme

- Spending multiplier $= 1/MPS = 1/0.2 = 5$. Minimum required change in government spending $=$ recessionary gap $\div$ spending multiplier $= \$300$ billion$/5 = \$\mathbf{60}$ billion. One point is earned for this calculation.

Solution 1

(d)(ii)

Mark scheme

- The minimum required change in taxes will be GREATER than the minimum required change in government spending from part (d)(i). Explanation: the tax multiplier $= MPC/MPS = 0.8/0.2 = 4$ is smaller in magnitude than the government-spending multiplier $= 1/MPS = 1/0.2 = 5$, because part of the initial increase in disposable income from a tax cut is saved rather than spent — only the MPC share is spent — so a larger tax cut than spending increase is needed to close the same gap. One point for stating 'greater than'; one point for this multiplier explanation.

Solution 1

(e)

Mark scheme

- Setup only — the government lowers income tax rates to eliminate the recessionary gap; effects on (e)(i) aggregate demand and (e)(ii) long-run aggregate supply are graded separately below.

Solution 1

(e)(i)

Mark scheme

- Aggregate demand will INCREASE. Explanation: lower income tax rates raise households' disposable income, which increases consumption and/or investment, shifting AD to the right. One point is earned for stating AD increases with this explanation.

Solution 1

(e)(ii)

Mark scheme

- Long-run aggregate supply — any ONE of the following earns the point: (1) LRAS stays the SAME, because lowering income taxes raises consumption/investment (demand-side) but does not change the economy's inputs (labor, capital, technology, resources); OR (2) LRAS INCREASES in the long run, because lower taxes raise savings and investment in physical capital, or increase incentives to work; OR (3) LRAS DECREASES in the long run, because lower taxes cause crowding out of private investment. One point is earned for stating and explaining any one of these three positions.