# Past-paper walk-through

## Economic Growth ▪ 5.6

eXercise

# Questions in this set

- 2023 Set 1 Q1
- 2022 Set 2 Q2
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- 2019 Set 2 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

2023 Set 1 ▪ Q1

Assume the economy of Vanderlandia is in short-run equilibrium with a real GDP of $500 million. The full-employment level of real GDP is $550 million.

**(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.

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

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

# Question 1

2023 Set 1 ▪ Q1

Assume the economy of Vanderlandia is in short-run equilibrium with a real GDP of $500 million. The full-employment level of real GDP is $550 million.

**(b)(i)** Assume no policy action is taken to restore full employment.
Explain how the economy will adjust in the long run.

**(b)(ii)** Following the long-run adjustment process, will the price level in Vanderlandia be greater than, less than, or equal to $PL_1$ shown on your graph in part (a)?

# Question 1

2023 Set 1 ▪ Q1

Assume the economy of Vanderlandia is in short-run equilibrium with a real GDP of $500 million. The full-employment level of real GDP is 550 million.

**(c)(i)** Assume instead that policymakers in Vanderlandia are considering changing government spending to restore full employment in the short run and that the marginal propensity to save is $0.2$.

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.

**(c)(ii)** On your graph in part (a), show the short-run effect of the change in government spending in part (c)(i), labeling the new equilibrium price level $PL_2$.

# Question 1

2023 Set 1 ▪ Q1

Assume the economy of Vanderlandia is in short-run equilibrium with a real GDP of $500 million. The full-employment level of real GDP is $550 million.

**(d)** Draw a correctly labeled graph of the loanable funds market, and show the effect of the change in government spending in part (c)(i) on the equilibrium real interest rate.

# Question 1

2023 Set 1 ▪ Q1

Assume the economy of Vanderlandia is in short-run equilibrium with a real GDP of $500 million. The full-employment level of real GDP is $550 million.

**(e)(i)** Based on the change in the real interest rate shown on your graph in part (d), what will happen to each of the following?

The price of previously issued bonds

**(e)(ii)** The rate of economic growth in the long run. Explain.

# Solution 1

**(a)**

**Mark scheme**

- Draw a standard downward-sloping AD curve and upward-sloping SRAS curve (Price Level on the vertical axis, Real GDP on the horizontal axis). Label their intersection as the current equilibrium, with equilibrium output $Y_1$ on the horizontal axis and equilibrium price level $PL_1$ on the vertical axis (dashed lines from the intersection to each axis) — this earns Point 1. Then add a vertical long-run aggregate supply curve (LRAS) positioned to the RIGHT of $Y_1$, and label the real GDP value at which it sits $Y_F$ (full-employment output) — this earns Point 2.

# Solution 1

**(b)(i)**

**Mark scheme**

- Since $Y_1$ is below full-employment output $Y_F$ (a recessionary gap), in the long run nominal wages and other input prices (and/or inflationary expectations) will decrease. This fall in input costs causes short-run aggregate supply (SRAS) to increase (shift rightward) until the economy self-corrects back to equilibrium at full employment, $Y_F$.

# Solution 1

**(b)(ii)**

**Mark scheme**

- The price level following the long-run adjustment will be LESS THAN $PL_1$ — as SRAS shifts rightward, the new equilibrium slides down along AD, so both output rises to $Y_F$ and the price level falls below its original level $PL_1$.

# Solution 1

**(c)(i)**

**Mark scheme**

- Spending multiplier $= 1/MPS = 1/0.2 = 5$. Minimum change in government spending $= \dfrac{\text{Output Gap}}{\text{Spending Multiplier}} = \dfrac{\$50\text{ million}}{5} = \$10\text{ million}$. Government spending must INCREASE by $10 million to fully close the recessionary output gap in the short run.

# Solution 1

**(c)(ii)**

**Mark scheme**

- On the graph from part (a), shift the AD curve rightward (from $AD_1$ to $AD_2$) so the new short-run equilibrium occurs exactly where $AD_2$ intersects $\text{SRAS}_1$ at the vertical LRAS curve (i.e., at $Y_F$), with the new, higher equilibrium price level labeled $PL_2$ (where $PL_2 > PL_1$).

# Solution 1

## (d) Mark scheme

- Draw a standard loanable funds market graph (Real Interest Rate on the vertical axis, Quantity of Loanable Funds on the horizontal axis) with a downward-sloping demand curve $D_{LF_1}$ and an upward-sloping supply curve $S_{LF_1}$ intersecting at equilibrium interest rate $r_1$ and quantity $Q_1$ — this earns Point 1. Then show the effect of the increased government spending/borrowing from part (c)(i): the government's borrowing increases the demand for loanable funds, shifting $D_{LF_1}$ rightward to $D_{LF_2}$ (an equally valid alternative is showing the supply of loanable funds decreasing from $S_{LF_1}$ to $S_{LF_2}$). Either shift raises the equilibrium real interest rate from $r_1$ to a higher $r_2$ — this earns Point 2.

# Solution 1

**(e)(i)**

**Mark scheme**

- The price of previously issued bonds will DECREASE. Bond prices and interest rates move inversely: as the real interest rate rises from $r_1$ to $r_2$, existing bonds with fixed coupon payments become less attractive relative to new, higher-rate bonds, so their market price falls.

# Solution 1

**(e)(ii)**

**Mark scheme**

- The rate of long-run economic growth will DECREASE. Explanation: the increase in the real interest rate raises the cost of borrowing, which decreases investment spending on physical capital, human capital, and/or research and development. Since these are key drivers of an economy's productive capacity (they shift LRAS rightward over time), less investment in them slows the long-run growth rate.

# Question 2

2022 Set 2 ▪ Q2

The table below shows macroeconomic data for Country A.

| Year | Nominal GDP | GDP Deflator | Population |
|---|---|---|---|
| 2020 | 40,000 | 100 | 100 |
| 2021 | 88,000 | 200 | 110 |

# Question 2

**(a)(i)** Calculate each of the following for Country A in year 2021. Show your work.
Real GDP
**(a)(ii)** Calculate each of the following for Country A in year 2021. Show your work.
Real GDP per capita
**(b)** Based solely on the data provided, has the standard of living for the average person in Country A increased, decreased, or stayed the same between 2020 and 2021 ? Explain.
**(c)** How would an increase in government spending on education affect economic growth in Country A? Explain.
**(d)** Assume that Country A produces consumer goods and capital goods. Draw a correctly labeled production possibilities curve for Country A, and show the effect of the increase in government spending on education on your graph.

# Solution 2

**(a)(i)**

**Mark scheme**

- Real GDP in 2021 = 44,000. Work: Real GDP = (Nominal GDP ÷ Price Index) × 100 = (88,000 ÷ 200) × 100 = 44,000. 1 point for the correct value (44,000) with work shown. (In the official scoring guidelines this single point is shared with part (a)(ii): both the real GDP and real GDP per capita values are required together for the point.)

# Solution 2

**(a)(ii)**

**Mark scheme**

- Real GDP per capita in 2021 = 400. Work: Real GDP per Capita = Real GDP ÷ Population = 44,000 ÷ 110 = 400. 1 point for the correct value (400) with work shown. (Shares its official 1 point with part (a)(i); each value is graded here for its own point.)

# Solution 2

**(b)**

**Mark scheme**

- The standard of living for the average person in Country A has STAYED THE SAME between 2020 and 2021. Explanation: real GDP per capita in Country A did not change from 2020 to 2021 (it remains 400, per the data provided and the value computed in part (a)(ii)) — and real GDP per capita, not nominal GDP or population alone, is the best measure available here of the average person's standard of living. 1 point for stating 'stayed the same' AND explaining via unchanged real GDP per capita.

# Solution 2

**(c)**

**Mark scheme**

- An increase in government spending on education WILL PROMOTE (increase) economic growth in Country A. Explanation: spending on education increases human capital — the skills, knowledge, and training embodied in workers — which makes the labor force more productive; higher labor productivity increases the economy's potential (long-run) output, i.e., economic growth. 1 point for stating that growth increases AND explaining via human capital and labor productivity.

# Solution 2

**(d)**

**Mark scheme**

- Draw a correctly labeled production possibilities curve (PPC) graph: axes Capital Goods (vertical) and Consumer Goods (horizontal), with a bowed-out (concave-to-the-origin) curve $PPC_1$ — 1 point. Second point: show an outward (rightward) shift of the entire curve, from $PPC_1$ to a new curve $PPC_2$ lying further from the origin at every point (an arrow from $PPC_1$ to $PPC_2$), reflecting the economic growth from the increase in human capital/labor productivity identified in part (c) — 1 point. Total 2 points.

# Question 3

2022 Set 2 ▪ Q3

The economy of Country Zeta is in long-run equilibrium; however, the government is concerned about the size of the national debt.

**(a)** Identify one specific fiscal policy action the government could take to reduce the national debt.

**(b)** Draw a correctly labeled graph of the loanable funds market, and show the effect of the fiscal policy action identified in part (a) on the real interest rate.

**(c)(i)** Based on the change in the real interest rate identified in part (b), what will happen to each of the following?

Aggregate demand in the short run. Explain.

**(c)(ii)** Based on the change in the real interest rate identified in part (b), what will happen to each of the following?

Potential real output. Explain.

# Solution 3

**(a)**

**Mark scheme**

- Any ONE specific contractionary fiscal policy action that would reduce the national debt: increase taxes, decrease government spending, or decrease transfer payments. 1 point for correctly identifying any one of these — each shrinks the budget deficit (or produces a surplus), slowing or reversing growth of the national debt, which is the accumulated stock of past deficits.

# Solution 3

**(b) Mark scheme**

- Draw a correctly labeled loanable funds market graph: axes Real Interest Rate (vertical) and Quantity of Loanable Funds (horizontal), with an upward-sloping supply curve $S_{LF_1}$ and a downward-sloping demand curve $D_{LF_1}$ intersecting at real interest rate $r_1$ and quantity $Q_1$ — 1 point. Second point: show EITHER a leftward shift of the demand for loanable funds ($D_{LF_1} \rightarrow D_{LF_2}$, since the fiscal action from part (a) reduces government borrowing) OR a rightward shift of the supply of loanable funds ($S_{LF_1} \rightarrow S_{LF_2}$); either shift produces a new equilibrium with a LOWER real interest rate $r_2$ ($r_2 < r_1$) — 1 point. Total 2 points; either shift direction is acceptable as long as it lowers the real interest rate.

# Solution 3

**(c)(i)**

**Mark scheme**

- Aggregate demand WILL INCREASE in the short run. Explanation: the decrease in the real interest rate identified in part (b) lowers the cost of borrowing, which increases interest-sensitive spending — consumption, investment, and/or net exports — increasing aggregate demand. 1 point for stating the increase AND naming at least one interest-sensitive spending component that rises.

# Solution 3

**(c)(ii)**

**Mark scheme**

- Potential real output (the economy's long-run/full-employment output) WILL INCREASE. Explanation: the decrease in the real interest rate means the cost of borrowing has decreased, which increases investment spending on plant and equipment; this increased capital formation raises the economy's capital stock and therefore its potential real output. 1 point for stating the increase AND giving this capital-formation 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

2019 Set 2 ▪ Q3

Sweden and Norway use equal quantities of resources to produce food and capital goods. The table below shows the maximum possible production of food OR capital goods for each country.

| **Country** | **Food** | **Capital Goods** |
|---|---|---|
| Sweden | 50 | 100 |
| Norway | 30 | 120 |

# Question 3

**(a)** Draw a correctly labeled graph of the production possibilities curve for Sweden. Place food on the horizontal axis and capital goods on the vertical axis. Plot the relevant numerical values on the graph.

# Question 3

| Country | Food | Capital Goods |
|---|---|---|
| Sweden | 50 | 100 |
| Norway | 30 | 120 |