

1. The economy of Alpha is in short-run equilibrium with a cyclical unemployment rate of 3%, a frictional unemployment rate of 4%, and an actual unemployment rate of 8%.
  - (a) Calculate Alpha's natural rate of unemployment. Show your work.
  - (b) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Alpha, and show each of the following.
    - (i) The current equilibrium output and price level, labeled  $Y_1$  and  $PL_1$ , respectively
    - (ii) The full-employment output, labeled  $Y_F$
  - (c) Assume that policymakers take no action to close the output gap.
    - (i) Explain how Alpha's economy will adjust to full employment in the long run.
    - (ii) On your graph in part (b), show how Alpha's economy will adjust to full employment in the long run, labeling the new equilibrium price level  $PL_2$ .
  - (d) Assume instead that Alpha's central bank is considering using monetary policy to close a recessionary output gap. The banking system in Alpha has ample reserves. Identify a specific monetary policy action the central bank of Alpha would take to close the output gap in the short run.
  - (e) Draw a correctly labeled graph of the reserve market in Alpha, and show the effect of the action taken by the central bank identified in part (d) on the policy rate.
  - (f) Based on the change in the policy rate shown in part (e), what would happen to each of the following in the short run in Alpha?
    - (i) The price of previously issued bonds
    - (ii) The price level. Explain.

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**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.**

2. The table provided shows economic data for the country of Louland. The base year is year 1, and the GDP deflator in year 2 is 115.

	Year 1	Year 2
Nominal GDP	800,000	1,035,000
Population	1,000	1,200

- (a) Calculate real GDP in Louland in year 2. Show your work.
- (b) How would the change in real GDP from year 1 to year 2 affect the demand for money and the nominal interest rate in Louland?
- (c) Did the standard of living of the average citizen in Louland increase, decrease, or remain the same from year 1 to year 2? Explain using numbers.
- (d) What was the numerical value of the inflation rate from year 1 to year 2?
- (e) If nominal wages increased by 10% from year 1 to year 2, what happened to the real wages of workers in Louland during this time? Explain.

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**Question 1: Long****10 points**

- (a) Calculate the natural rate of unemployment as 5% and show your work. **1 point**

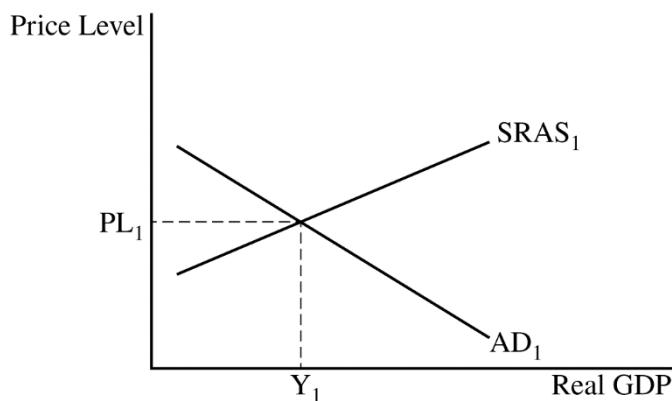
$$\text{Natural UER} = \text{Actual UER} - \text{Cyclical UER} = 8\% - 3\% = 5\%$$

OR

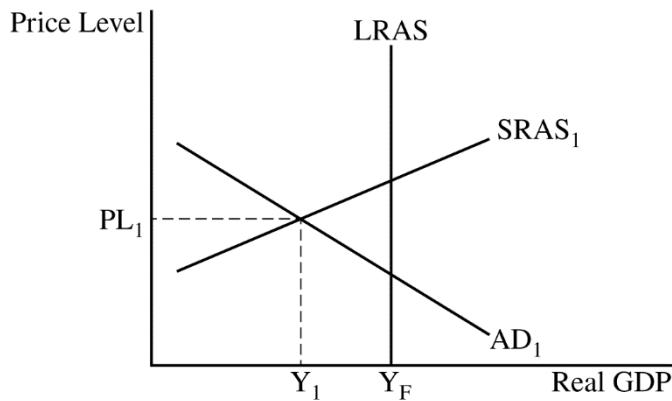
$$\text{Structural UER} = \text{Actual UER} - \text{Cyclical UER} - \text{Frictional UER} = 8\% - 3\% - 4\% = 1\%$$

$$\text{Natural UER} = \text{Frictional UER} + \text{Structural UER} = 4\% + 1\% = 5\%$$

- (b) Draw a correctly labeled aggregate demand–aggregate supply graph that shows  $PL_1$  and  $Y_1$  at the intersection of the aggregate demand (AD) and short-run aggregate supply (SRAS) curves. **1 point**

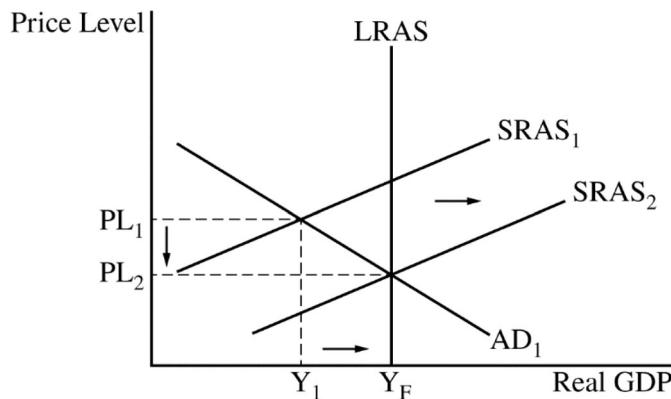


For the second point, the graph must show a vertical long-run aggregate supply (LRAS) curve to the right of  $Y_1$  and label the full-employment output  $Y_F$ . **1 point**

**Total for part (b) 2 points**

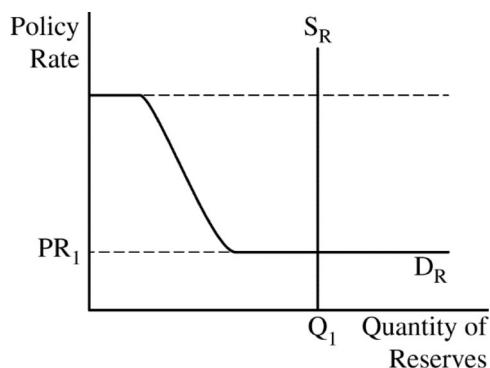
- (c) (i) Explain that input prices (e.g., nominal wages) and/or inflationary expectations will decrease, causing SRAS to increase until it reaches full employment. **1 point**

- (ii) On the graph from part (b), show how Alpha's economy will adjust to full employment in the long run by shifting the SRAS curve to the right until it intersects the AD and LRAS curves at a lower price level, labeled PL<sub>2</sub>. **1 point**

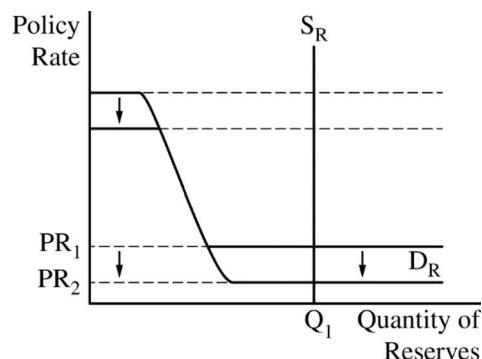


**Total for part (c) 2 points**

- (d) State that the central bank would decrease its administered interest rates or decrease interest on reserves. **1 point**
- (e) Draw a correctly labeled graph of the reserve market with the supply curve intersecting the demand curve in the range of ample reserves. **1 point**

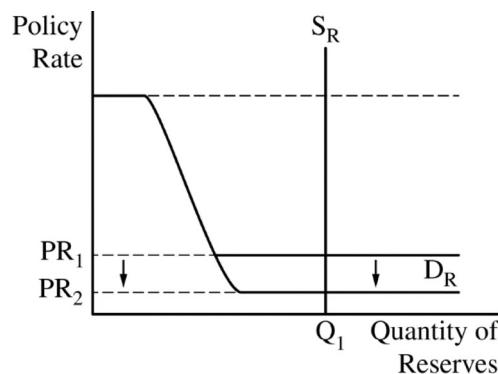


For the second point, the graph must show a decrease in the administered interest rates, resulting in a decrease in the policy rate. **1 point**



OR

For the second point, the graph must show a decrease in the lower bound of the demand curve for reserves, resulting in a decrease in the policy rate.



**Total for part (e) 2 points**

- (f) For the first point, state that the price of previously issued bonds will increase and the price level will increase. **1 point**

For the second point, explain that the decrease in nominal interest rates will increase interest-sensitive spending (consumption, investment, or net exports), which will increase aggregate demand. **1 point**

**Total for part (f) 2 points**

**Total for question 1 10 points**