Question 1 (40 points, 2 points each)

Question 2 (9 points)
1) List the Fed’s four goals of monetary policy. (4 pts)
   Answer:
   Economic growth, price stability, high employment, and the stability of financial markets and financial institutions.
2) List the Fed’s three main monetary policy tools. (3 pts)
   Answer:
   Open market operation, discount rate and require reserve ratio.
3) List the Fed’s two main monetary policy targets. (2 pts)
   Answer:
   Money supply and the short run interest rate.

Question 3 (11 points)
Suppose you deposit $4,000 in currency into your checking account at Bank of America. Assume that Bank of America has no excess reserves at the time you make your deposit and that the required reserve ratio is 10 percent.
1) Use a T-account to show the initial effect of this transaction on bank of America's balance sheet. (3 pts)
2) Suppose that Bank of America makes the maximum loan they can from the funds you deposited. Use a T-account to show the initial effect on Bank of America's balance sheet from granting the loan. Also include in this T-account the transaction from question (1). (3 pts)
3) What is the maximum increase in checking account deposits of the whole banking system that can result from your $4,000 deposit? What is the
maximum increase in the money supply? Are they equal? Why? (5 pts)
Answer
1) Bank of America's (Bank A) checking account deposits and reserves rise by $4,000.

<table>
<thead>
<tr>
<th>Bank A</th>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
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<td>Reserves</td>
<td>+$4,000</td>
<td>Deposits</td>
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2) Bank of America (Bank A) has to hold $400 of required reserves, leaving $3,600 of excess reserves which they loan. Bank of America increases the checking account of the borrower by $3,600.

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3) The maximum increase in checking account deposits is $40,000: $4,000 times the simple deposit multiplier of $1/0.10, or 10. Given that the original deposit of $4,000 came from currency, the money supply will increase by $36,000: $40,000 minus $4,000. They are not equal because cash is already counted in original money supply.

Note: You will receive full credits for 3) if your answer is that both are “equal” to $40,000. In the class when we talked about the deposit multiplier we usually use money supply to refer to checking account deposits because in the U.S. checking account deposits take a big fraction of total money supply. This may make you think they are equal. But actually the money supply includes both cash and checks. The simple deposit multiplier works only for checking account deposits.

Question 4 (20 points)
1) Using money supply and money demand model to verbally and graphically explain how an open market purchase of Treasury securities by the Fed would affect the equilibrium short-run money market interest rate. (10 pts)
Answer:
An open market purchase of Treasury securities increases the money supply. The vertical money supply curve shifts to the right. The money demand curve is constant. Equilibrium short-run interest rate decreases.
2) Using money supply and money demand model to *verbally and graphically* explain how the equilibrium short-run money market interest rate would change when the economy goes into a recession and the Fed does not pursue monetary policy. (10 pts)

**Answer:**
As the economy goes into a recession, money demand decreases because the amount of buying and selling goods and services decreases. The money demand curve shifts to the left. Because the Fed does not pursue monetary policy, the money supply curve is constant. Equilibrium short-run interest rate decreases.

**Question 5 (10 points)**
Use *Dynamic AD-AS* framework to *verbally and graphically* show how an open market sale of Treasury securities by the Fed would be useful to fight inflation.

**Answer:**
As all LRAS, SRAS and AD curves shift to the right, if AD curve shifts faster than SRAS curve, at the short-run equilibrium the real GDP will be above the potential GDP and the price level will increase. The inflation will happen. An open market sale of Treasury securities by the Fed decreases the money supply and increases the interest rate. Therefore consumption, investment and net export decrease. AD curve is pulled down to the left and the price level will be lower at new short-run equilibrium. A contractionary monetary policy is then useful to fight inflation. (See the slides for graph)

**Question 6 (10 points)**
Can the Fed target both the money supply and an interest rate at the same time? Explain your answer *verbally and graphically*.

**Answer:**
No. The reason is that the Fed cannot control the money demand. When the money demand curve is constant to the Fed, an increase in money supply will unambiguously decrease interest rate (The money supply curve shifts to the right. The money demand curve is constant. Equilibrium interest rate has to decrease.) and vice versa. Therefore, if the Fed targets the interest rate it loses control for the money supply, and if the money supply is targeted, the Fed cannot control the interest rate. (See the slides for graph)

**Question 7 (Extra 5 points)**
What is the price of a Treasury bill that pays $1,000 in one year, if its interest rate is 10 percent? What is the price of the Treasury bill if its interest rate is 8 percent?
Answer:
For 10 percent interest rate:
\[(\$1,000 - P)/P \times 100 = 10;\] Dividing both sides by 100 and multiplying both sides by P we get:
\[\$1,000 - P = 0.1P; \quad \$1,000 = 1.1P; \quad \$1,000/1.1 = P; \quad P = \$909\]

For 8 percent interest rate:
\[(\$1,000 - P)/P \times 100 = 8;\] Dividing both sides by 100 and multiplying both sides by P we get:
\[\$1,000 - P = 0.08P; \quad \$1,000 = 1.08P; \quad \$1,000/1.08 = P; \quad P = \$926\]