Problem 1. Match things.

(a) store of value

(b) fiat money

(c) medium of exchange

(d) unit of account

(e) commodity money

(i) the function of money that refers to money's usefulness as an asset

(ii) type of money that has no intrinsic value, but is still used as a means of payment

(iii) function of money that allows the avoidance of the double coincidence of wants problem associated with barter, i.e. facilitates transactions

(iv) function of money that allows prices to be easily expressed according to a standard measure

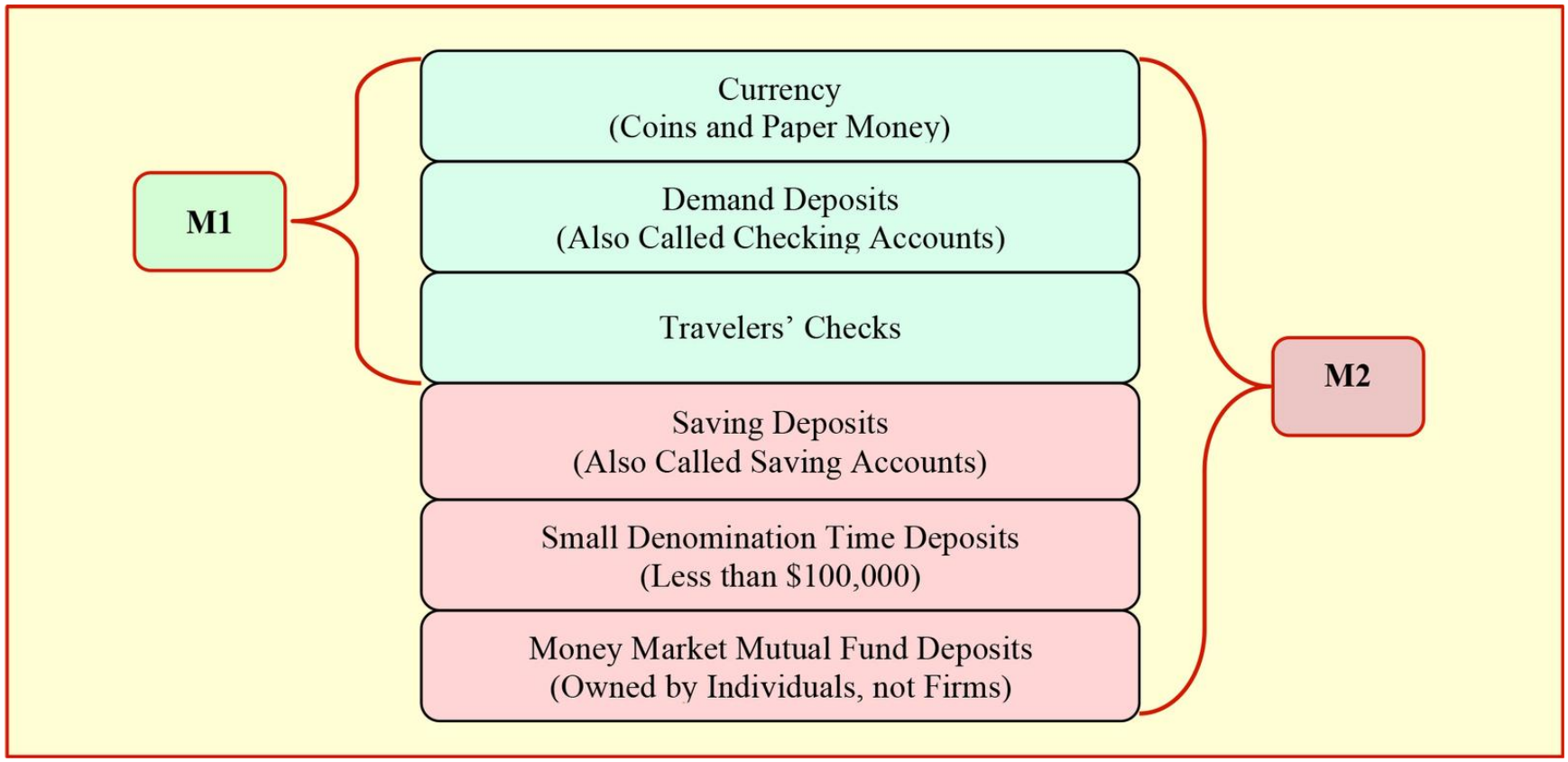
(v) type of money that has other uses besides serving as money, and thus has intrinsic value

Answer 1. I got lazy—they match in the order in which they're written.

Problem 2. Given the following components of the money supply, find M1 and M2.

currency	3
travelers' checks	1
demand deposits	6
savings deposits	10
small denomination time deposits	30
individual money market mutual funds	50

Answer 2. There are two primary measures of money. **M1** is the most liquid forms of money. **M2** is slightly less liquid forms of money, in addition to everything in M1.



$$M1 = \$3 + \$1 + \$6 = \$10,$$

$$M2 = M1 + \$10 + \$30 + \$50 = \$100.$$

Problem 3. Abigail withdraws $100 from her savings account and deposits it in her checking account. As a result

(a) M1 remains unchanged, M2 decreases

(b) M1 remains unchanged, M2 increases

(c) M1 decreases, M2 remains unchanged

(d) M1 decreases, M2 decreases

(e) None of the above

Answer 3: e. The money in the savings account wasn't part of M1, but now that it's in a checking account it is part of M1. So M1 in increases. However, that money is part of M2 in either case, so M2 doesn't change.

Problem 4. Match even more! Do it!

(a) discount loan

(b) discount rate

(c) required reserve ratio

(d) open market operations

(e) federal funds loan

(f) federal funds rate

(i) money banks borrow from the Fed

(ii) the rate of interest charged on loans made by the Fed discount rate

(iii) a fraction of demand deposits banks are required not to loan out required reserve ratio

(iv) the Fed's purchases and sales of government bonds

(v) money banks borrow from other banks overnight

(vi) the rate of interest charged on federal funds loans

Answer 4. I got lazy again—they match in the order they're written. Note the awkwardness of terminology: *federal* funds loans are **not** loaned from the *Federal* Reserve.

Reserves and Open Market Operations

Required Reserves. Here's how it works. Suppose the required reserve ratio is 10%, and suppose people put $1000 into the bank as demand deposits. Then the bank must keep 10% of that $1000, i.e. $100. They can loan out the remaining $900.

Open Market Operations. When the Fed buys a bond from a bank, the bank is paid in reserves. As soon as the bank loans out these reserves, they become part of someone's checking or savings account and therefore money supply increases. *So an open market purchase increases the money supply.* This is the Federal Reserve's primary tool for controlling the money supply. An open market sale has the opposite effect.

Problem 5. Match match match match? Match match match match.

(a) balance sheet

(b) required reserves

(c) excess reserves

(d) fully loaned out

(i) statement of assets, liabilities, and net worth

(ii) minimum amount of cash that banks must hold at all times

(iii) the amount of cash that banks might hold in excess of what is required by the Fed

(iv) banks are said to be this when they have no excess reserves

Answer 5. Hey guess what, they're in the same order again.

Consider the example from before. Suppose the required reserve ratio is 10%, and suppose people put $1000 into the bank as demand deposits. Then the bank must keep 10% of that $1000, i.e. $100. They can loan out the remaining $900.

If the bank does loan out that entire $900 that they're allowed to loan out, then they are **fully loaned out.** If they only lend out $800 of it, then they have $100 in **excess reserves**.

Problem 6. The required reserve ratio is 10%. Assume that the bank is fully loaned out and all deposits are checking. What is the bank's net worth?

Assets		Liabilities and Net Worth	
Reserves	?	Demand Deposits	300,000,000
Treasury Bonds	5,000,000	Borrowed from Fed	8,000,000
		Borrowed from Banks	7,000,000
Loans	350,000,000	Net Worth	?

Answer 6. The bank has deposits of 300,000,000. They're required to hold onto 10% of of it, i.e. 30,000,000. We're told that the bank is fully loaned out, so we can conclude that they hold reserves of 30,000,000. Then the net worth is calculated as

$$\begin{aligned}\text{net worth} &= \text{assets} - \text{liabilities} \\ &= (30,000,000 + 5,000,000 + 350,000,000) - (300,000,000 + 15,000,000) \\ &= 70,000,000.\end{aligned}$$

Assets		Liabilities and Net Worth	
Reserves	30,000,000	Demand Deposits	300,000,000
Treasury Bonds	5,000,000	Borrowed from Fed	8,000,000
		Borrowed from Banks	7,000,000
Loans	350,000,000	Net Worth	70,000,000

Note that net worth is sometimes called **bank capital**. It represents the amount that belongs to the bank's shareholders. Banks are required by law to hold a minimum amount of bank capital. This is for the two reasons: to prevent excessive risk taking, and to ensure that the bank has enough money to pay its depositors or creditors in case some of the bank loans default.

Problem 7. Simply stated, all else being the same, the money supply will increase when

(a) people work and receive wages and salaries from their employers

(b) people save some of their waves and salaries and deposit those savings in their banks

(c) people spend some of their wages and salaries on goods and services

(d) banks lend money to people

(e) none of the above

Answer 7: d. A bank typically has some reserves available that it can lend. Reserves are not part of the money supply – reserves are just funds that sit in a bank collecting dust. However, when a bank loans those reserves out, they enter someone's checking or savings account and voilá, now those funds count as money. (Conversely, the money supply shrinks when loans are paid back because funds in currency or checking or savings become bank reserves.)

Problem 8. Consider the following bank balance sheet:

Assets		Liabilities and Net Worth	
Reserves	$20,000	Demand Deposits	$150,000
		Other Deposits	$650,000
Treasury Bonds	$30,000	Discount Loans	$20,000
		Interbank Loans	$80,000
Loans	$950,000	Net worth	$100,000

The required reserve ratio is 10 percent. How many excess reserves is the bank holding?

Answer 8. The bank is required to keep 10% of its demand deposits as reserves, in this case, $15,000. It's actually holding $20,000, so $5,000 excess reserves. Banks can loan out this excess $5,000 if they choose to, thereby increasing the money supply.

If a bank lends out that $5,000, then they might credit it to the borrower's savings account, in which case Other Deposits would increase by $5,000 and Loans would increase by $5,000. As soon as that borrowed money is spent and leaves the bank, Other Deposits and Reserves will both fall by $5,000.

Problem 9. Consider the following bank balance sheet:

Assets		Liabilities and Net Worth	
Reserves	$20,000	Demand Deposits	$150,000
		Other Deposits	$650,000
Treasury Bonds	$30,000	Discount Loans	$20,000
		Interbank Loans	$80,000
Loans	$950,000	Net worth	$100,000

How much does the bank owe the Federal Reserve? How much to other banks?

Answer 9. Discount loans are funds borrowed from the Fed, so $20,000. Interbank lending, aka federal funds loans, are borrowed from other banks, here $80,000.