5. **First National Bank**

Assets		Liabilities	
Reserves	$3 m	Checkable deposits	$22 m
Treasury bonds	$3 m	Certificates of deposits	$75 m
Residential mortgages	$50 m		
Commercial loans	$50 m	Bank capital	$9 m

Second National Bank

Assets		Liabilities	
Reserves	$3 m	Checkable deposits	$22 m
Treasury bonds	$3 m	Other Borrowings	$75 m
Real estate loans	$45 m		
Commercial loans	$55 m	Bank capital	$9 m

Use the above balance sheets to answer the following questions. The questions are **unrelated** with each other.

A. Calculate the banks' reserve ratio. **(1 point)**

B. If the required reserve is 10%, what is the maximum deposit outflow that each bank can handle before it has to change its asset holdings? **(3 points)**

C. If the capital requirement is 8% of risk-adjusted assets, what is the minimum capital that each bank needs to maintain the current balance sheet? **(2 points)**

D. If both banks suffer a loss of $3 m in the portfolio of commercial loans, which bank will be undercapitalized? And, by how much? **(2 points)**

E. What can the bank do to meet the capital requirement? (No calculation needed) **(2 points)**

6.

A. A fund manager holds a bond which pays \$10 in one year, \$15 in two years, \$15 in three years and \$120 in four years from now. The current interest rate i for this bond is 5%. What is the duration of the bond? **(2 points)**

B. Assume that the interest rate i rises to 5.5%. What is the change of the equilibrium bond price (in \$) in that case if you use the bond's duration to calculate the price change? **(2 points)**

C. Assume you are the manager of a large pension fund. For some reason, you have private information and know that the interest rate will increase in the (near) future. Would you purchase a bond with short or long duration in this situation? Briefly explain your answer. **(2 points)**

7. Assume that the (expected) one-year interest rates over the next five years are 3%, 4%, 5%, 6%, and 7%. The interest rates on one- to five-year bonds are 3%, 4%, 5%, 6%, and 8%. Determine the liquidity premium for a two-year, three-year, four-year, and five-year bond. **(2 points)**

8. Suppose yield to maturities of discount bonds issued by China Mobile are shown as follows:

1-year	2.5%
2-year	3%
3-year	3.2%

Compute the price of the 3-year annual coupon bond with 4% coupon issued by China Mobile with \$1000 face value. **(2 points)**