Write your name on the cover of the test booklet and nowhere else. Enclose this sheet with the booklet. Failure to follow these directions will cost you 1 point. The test has 150 points (to be scaled up to 210 points) and is scheduled to take 75 minutes. Therefore, expect to spend 1 minute for every 2 points. For example, a 12-point question should take 6 minutes. I can give extra time but not much.

$$PV = PMT * \left[\frac{1 - \frac{1}{(1+(r/m))^{mN}}}{r/m} \right] + \frac{FV}{(1+(r/m))^{mN}} \qquad V_b = \frac{INT}{m} \sum_{t=1}^{mN} \left(\frac{1}{1+\frac{r_b}{m}} \right)^t + \frac{M}{\left(1+\frac{r_b}{m}\right)^{mN}}$$

$$i_{bey} = \left(\frac{P_f - P_0}{P_0} \right) \left(\frac{365}{h} \right) \qquad EAR = \left(1 + \frac{i_{bey}}{365/h} \right)^{365/h} - 1$$

1) (4 points each) Define FOUR of the following.
A) Money market
B) Mutual fund
C) Premium bond
D) Duration (as opposed to maturity)
E) Money base (sometimes called monetary base)
F) LIBOR

2) (10 points) Answer EITHER Part A OR Part B.
A) Suppose you bought a three-month T-bill for $998. If its face value is $1000, then what are the T-bill discount yield ($i_{\text{T-bill, dy}}$) and the bond effective yield ($i_{\text{T-bill bey}}$). Briefly state how you did the calculation and show all work.
B) Suppose you bought a two-month commercial paper for $999. If its face value is $1000, then what are the discount yield ($i_{\text{cp, dy}}$) and the bond effective yield ($i_{\text{cp, bey}}$). Briefly state how you did the calculation and show all work.

3) (10 points) Answer EITHER Part A OR Part B.
A) Suppose a $3000 bond has a coupon rate of 4%, with interest paid quarterly. If the last interest payment was 30 days ago, how much is the accrued interest? How did you get those numbers?
B) Suppose a muni was paying 3% interest. If you were in the 40% tax bracket, then what is the equivalent return for a taxable bond? Explain your logic and show all work.

4) (10 points) For EITHER a convertible bond OR a bond with a sinking fund provision, tell me if that bond will yield a higher or lower return than a similar bond without that feature. Explain your logic.

5) (12 points) Answer EITHER Part A OR Part B.
A) Suppose a bond with a face value of $10,000, coupon rate of 8%, with interest paid quarterly, and a maturity of 2023, is selling for $10,100. Use your calculator to calculate the annual yield you are earning. Tell me how you how you determined what each value was.
B) Suppose a bond with a face value of $1,000, coupon rate of 6%, with interest paid semi-annually, and a maturity of 2028. You want a 4% annual return. Use your calculator to calculate the price you are willing to pay. Tell me how you how you determined what each value was.

6) (12 points) Answer EITHER Part A OR Part B.
A) Without drawing a graph, explain why the Fed cannot control (target) both the interest rate and the money supply at the same time.
B) Reserves show up on both the Fed's balance sheet and the bank's balance sheet. However, they show up on different sides of the sheets. Why is that?

7) (14 points) Answer EITHER Part A OR Part B.
A) We listed at least six reasons for using financial intermediaries. What are two of those reasons? Explain why they encourage us to use financial intermediaries.
B) Explain the difference between the primary market for stocks and the secondary market.

8) (14 points) Answer EITHER Part A OR Part B.
A) The graph at the end of the exam is the current yield curve. (Source: treasury.gov) What does it tell you about people's predictions for the future? Explain your logic. Why do you think the Treasury did not draw the x-axis to scale?
B) Draw the unbiased expectations hypothesis, and the liquidity preference hypothesis graphs to illustrate the market expecting interest rates to decrease slightly over time. Explain why the graph takes its shape.

9) (16 points) Answer EITHER Part A OR Part B.
A) We have not really discussed mortgages, but basically you pay a fixed annuity to the bank for the duration of the loan. There is no one time payment at the end. Suppose your loan is for $100,000 with 6% interest. How much would your monthly payments be if your loan lasted 30 years? How much would your monthly payments be if your loan was for 15 years? Briefly state how you got each number for the calculator and tell me what you typed into the calculator.
B) Suppose the lottery says they will pay you $90,000 per year for 20 years. The payments are made monthly. If the lottery wants a return of 8%, then how much would they pay you if you got the lump-sum payment? Briefly state how you got each number for the calculator and tell me what you typed into the calculator. The lottery will tell you that you won $1,800,000. Why is that number wrong? (It might help you if you figure out where they got that number from.

10) (18 points) Answer EITHER Part A OR Part B.
A) Draw the supply and demand for loanable funds obtained by issuing a British government bond. (Note: this is **not** the supply and demand for the bond.) Illustrate the effects the downgrade of British securities which occurred last week. Explain why the graph moved as drawn. What happens to the amount of funds loaned and the interest rate?
B) Draw the supply and demand for loanable funds. Illustrate the effect of an announcement by economists that they predict inflation will be higher this year than previously expected. Explain why the graph moved as drawn. What happens to the amount of funds loaned and the interest rate?

11) (18 points) Answer EITHER Part A OR Part B.
A) Draw the Fed's balance sheet and a bank's balance sheet. (Assume all excess reserves are loaned out.) Illustrate the effect of the Fed buying a $5000 bond from a bank. Explain why the two balance sheets changed as drawn. How much excess reserves does the bank have? How much did the money supply change at this step? If the money multiplier works to its fullest extent, then how much will the money supply ultimately increase? Explain how you reached each conclusion.
B) Draw the Fed's balance sheet and a bank's balance sheet. (Assume all excess reserves are loaned

out.) Illustrate the effect of the Fed lending $3000 bond to a bank. Explain why the two balance sheets changed as drawn. How much excess reserves does the bank have? How much did the money supply change at this step? If the money multiplier works to its fullest extent, then how much will the money supply ultimately increase? Explain how you reached each conclusion.