***Section* 1 (25 marks).** Answer **ALL 25** of the following multiple-choice questions. Answer on the **Word** answer sheet provided to you.

1. If the Bank of Canada purchases securities, and the sellers convert the proceeds of the sale into currency.
    a. The money supply and monetary base increase by the amount of the sale.
    b. The monetary base increases and the money supply decreases.
    c. The monetary base and the money supply changes.
    d. The monetary base and the money supply both increase by more than the amount of the sale.

2. Currently reserve requirements in the Canadian banking system are equal to
    a. 3%
    b. 0%
    c. 2%
    d. 5%

3. Because the Bank of Canada does not completely control _____, it does not tightly control the monetary base.
    a. open market sales
    b. the bank rate
    c. open market purchases
    d. advances to banks

4. The Bank of Canada will engage in a sale and repurchase agreement when it wants to _____ reserves _____ in the banking system.
    a. increase; permanently
    b. decrease; temporarily
    c. increase; temporarily
    d. decrease; permanently

5. A debt contract is incentive compatible
    a. if the borrower has the incentive to behave in the way that the lender expects and desires, since doing otherwise jeopardizes the borrower's net worth in the business.
    b. if the borrower's net worth is sufficiently high so that the lender's risk of moral hazard is significantly reduced.
    c. if the debt contract is treated like an equity.
    d. if both (a) and (b) of the above occur.

6. Bank A has chequable deposits of $100 million, vault cash equalling $1 million and deposits at the Bank of Canada equalling $14 million. If the desired reserve rate is ten percent what is the maximum amount Bank A could lend?
    a. $14 million
    b. $5 million
    c. $4 million
    d. $90 million
7. Financial intermediaries reduce the problems in lending associated with information asymmetries by all of the following except:
    a. collecting and processing standardized information.
    b. screening applicants to be sure they are creditworthy.
    c. monitoring loan recipients to be sure the funds are used properly.
    d. charging interest rates high enough to discourage undesirable borrowers.

8. Firm A has assets that are mainly in financial securities and whose liabilities carry variable interest rates; Firm B has the same assets as Firm A and the same amount of liabilities but its liabilities are all at fixed interest rates. If the central bank lowers interest rates, everything else constant:
    a. Firm B's net worth will increase more than Firm A's.
    b. Firm A's net worth will increase more than Firm B's.
    c. Neither firm's net worth will change.
    d. The net worth of both firms will increase and by the same amount.

9. The Efficient Markets Hypothesis is consistent with all of the following except
    a. short run price movements are unpredictable.
    b. prices reflect all available information.
    c. the best long term strategy is buy and hold.
    d. managers that understand investor psychology outperform the market average return.

10. Tom decides to withdraw $300 out of his chequing account. The impact of this transaction on the Bank of Canada's balance sheet will be:
    a. no change in total assets or total liabilities, but an increase in the liability of currency and a decrease in the liability of reserves by $300 respectively.
    b. no change in total assets but a decrease in the liability of currency and an increase in the liability of reserves by $300 respectively.
    c. total assets decrease by $300 and the liability of currency decreases by $300.
    d. no change in either total assets or total liabilities.

11. The Bank of Canada sells U.S. Treasury bonds to chartered banks. Which of the following best describes the impact on the Bank's and the Banking System's balance sheets resulting from this transaction?
    a. The Bank's assets and liabilities increase, the banking systems assets and liabilities decrease.
    b. The Bank's assets increase and its liabilities both increase. For the banking system, the value of assets and liabilities do not change, only the composition of assets changes.

c. The Bank's assets and liabilities do not change, only the compositions of the assets change. For the banking system, assets and liabilities increase.
d. The Bank's assets and liabilities both decrease. For the banking system, the value of assets and liabilities do not change, only the composition of assets changes.

12. The fact that financial intermediaries employ experts to carry out particular activities and so lower transactions costs is usually associated with the following economic concept:
a. the law of demand
b. economies of scale
c. comparative advantage
d. information costs

13. Assume that the desired reserve rate is ten percent, banks want to hold excess reserves in an amount that equals three percent of deposits, and the public withdraws ten percent of every deposit in cash. An open market purchase of $1 million by the Fed will see banking system deposits increase by:
A) more than $1 million but less than $10 million.
B) exactly $1 million.
C) less than $1 million.
D) more than $10 million but less than $20 million.

14. An open market sale of securities by the central bank to banks will:
a. increase the banks' revenue even if the bank does nothing with the reserves.
b. induce the banks to make more loans since their revenue will decrease if they do nothing.
c. increase the amount of deposits in the banking system.
d. increase the banks' willingness and ability to make loans.

15. If a person selling bonds to the Bank of Canada cashes the Bank's cheque
a. currency in circulation remains unchanged, but reserves increase.
b. reserves remain unchanged, but currency in circulation increases.
c. reserves remain unchanged, but currency in circulation declines.
d. currency in circulation remains unchanged, but reserves decline.

16. Because the Bank of Canada does not completely control _____, it does not tightly control the monetary base.
a. open market sales
b. the bank rate
c. open market purchases
d. advances to banks

17. In the early 1930s, the currency ratio in the United States rose, as did the desired reserve ratio. Money supply analysis predicts that, all else constant, the money supply should have
    a. risen.
    b. remain unchanged.
    c. fallen.
    d. either risen or fallen, since the two factors work in opposite directions.

18. The Bank of Canada will engage in a sale and repurchase agreement when it wants to _____ reserves _____ in the banking system.
    a. increase; permanently
    b. decrease; temporarily
    c. increase; temporarily
    d. decrease; permanently

19. One problem with the too-big-to-fail policy is that it _____ the incentive for _____ by banks.
    a. increases; moral hazard
    b. decreases; moral hazard
    c. increases; adverse selection
    d. decreases; adverse selection

20. Covenants such as those to discourage undesirable behaviour of borrowers and those which require borrowers to maintain and insure their collateral are intended to help solve the
    a. Adverse selection in equity contracts.
    b. Moral hazard in debt contracts.
    c. Adverse selection in debt contracts.
    d. Moral hazard in equity contracts

21. If bank depositors begin to withdraw more currency from banks,
    a. The monetary base is unchanged
    b. Bank reserves increase
    c. The monetary base decreases
    d. Bank reserves are unchanged

22. In the (Keynesian) Liquidity Preference Framework, when income is _____ during a business cycle contraction, interest rates will _____.
    a. rising, rise
    b. rising, fall
    c. falling, rise
    d. falling fall

23. In Canada banks are
    a. encouraged to borrow from each other at the overnight rate during a pre-settlement period.
    b. encouraged to borrow from the Bank of Canada at the bank rate.
    c. encouraged to leave large sums of money on deposit at the Bank of Canada
    d. none of the above.

24. Mary Jones is the president of a local bank. She knows that half of the loan applicants in town she would classify as high risk and the other half as low risk. She observes that the other banks in town charge two different interest rates, a lower rate for low risk borrowers and the higher rate for high risk borrowers. She decides that to have an advantage over the other banks she will offer an average rate to everyone. The likely result will be:
    a. Mary's bank will be highly successful as this will provide the bank with a large competitive advantage.
    b. Mary's bank is likely to see a dramatic increase in both types of borrowers.
    c. Mary's bank will experience adverse selection and have a disproportionate number of low risk borrowers.
    d. Mary's bank will experience adverse selection and have a disproportionate number of high risk borrowers.

25. The Coyne Affair motivated the Bank Act which
    a. established that the Bank of Canada had operational independence but did not have goal independence.
    b. resulted in the government writing regular directives to the Bank of Canada.
    c. required that the Department of Finance and the Bank of Canada not collude in setting policy.
    d. stipulated that the Bank of Canada was to conduct monetary policy in a way that was not transparent.

***Section* 2 (25 marks).** Answer the following three questions. Show your calculations with proper formulas. Correct answers without derivations will receive zero marks.

Question 1 (12 marks) This question tells a sad tale of Merrill Lynched, an "investment bank". Investment banks have a higher maximum asset to equity ratio of 20 (versus the 10 requirement imposed on regular banks). This allows them to earn a potentially higher rate of profit and pay higher (uninsured) deposit rates. The initial balance sheet (in millions of dollars) is as follows.

Assets		Liabilities	
Reserves	100	Deposits	1000
Loans	800	Bank Bonds	200
Securities	400	Bank capital	

(a) (1 marks) What is bank capital? Does it satisfy the regulation(s)?

(b) (2 marks) Merrill makes a healthy 8% return on both loans and securities (sub-prime mortgages) but only has to pay out 5% to both depositors and bondholders. Merrill pays no taxes because they are very clever. What is Merrill's annual net income, ROA and ROE?

(c) (2 mark) Merrill identifies 50 of reserves as excess reserves and decides to lend that out leaving 50 as reserves. How much does this improve the ROE?

Investment banks get the Shrub Administration to raise the maximum equity multiplier to 33. (Continue from part (c)).

(d) (2 mark) Merrill wants to maximize its return on equity and also grow the company by buying more securities by issuing bank bonds; reserves and deposits are the same as before. (Merrill figured this was a safe move because unlike loans, securities are usually liquid, and unlike deposits, bond funding cannot be quickly withdrawn.) Redraw the balance sheet. What is the maximum ROE?

Merrill suffered an electronic bank run on Monstrous Monday Sept 14 in which fearful demand depositors suddenly started withdrawing. Merrill can't sell the loans. The securities, which are sub-prime, receive 10 cents on the dollar in the crisis. (Merrill's can't get a loan from other banks or an Advance from the Fed.)

(e)(3 marks) After what quantity of withdrawals is Merrill insolvent? Redraw The new balance sheet.

(f) (2 marks): Now suppose there are deposit withdrawals of $390 million. What is the loss to bondholders and depositors if Merrill had received regulatory forbearance and continued to payout to all withdrawers by continuing to liquidate securities in insolvency. The loans can be liquated at 80%. Redraw the balance sheet. (In the end, Merrill was bailed out.)

Question 2 (6 marks) After careful analysis, you have determined that a firm's dividends should grow at 2%, on average, in the foreseeable future. The firm dividend starts at $3. The required rate of return on equity is 10%. Suppose the current price of the stock is $20.56.

(a) (1 mark) Assuming nothing changes, what is the price of the stock in three years?

(b) (1 mark) Is the stock price overpriced or underpriced? Why?

(c) (2 marks) Suppose after three years, dividends grow at a slower rate but constant of 1.8% for ever. Would you expect an increase or decrease in the required return? Compute the new required return.

d) (2 marks) Suppose the Fed make an open market purchase ($50 million) and First National Bank uses all proceeds from the Fed to make more loans. Draw T-account changes to First National Bank's balance sheet in three stages i.e. 1st the purchase, 2nd the loan, 3rd after the proceeds from the loan are spent by the borrower.

Question 3 (7 marks) Assuming that velocity and output were fixed, the basic Quantity Theory implies inflation equals the growth rate of the money supply, $\pi_t = \%\Delta M_t$.

a) (1 mark) Derive this relationship from the equation of exchange.

The rate of return on money is related to the inflation rate: $\%\Delta\Omega_t = -[\pi_t/(100 + \pi_t)]100$.

b) (2 marks) Under the basic Quantity Theory, what is the functional relationship between the rate of return on money and the growth rate of the money supply? If the rate of growth of the money supply is -12%, what is the rate or return on money?

During the Great Depression, the price level at end of 1929 is $P_{1929} = 1$, and the value of money increases by 50% over the three years from the end of 1929 to end of 1932.

c) (3 marks) What is the implied price level at the end of 1932? What is the average inflation rate from the end of 1929 to 1932? What is the average rate or return on money from the end of 1929 to 1932?

In reality rates neither output nor velocity were constant. From the end of 1931 to the end of 1932, output falls by 17%, velocity falls by 12% and the price level fell 10%. (Hint: equation of exchange)

d) (1 mark) What is the implied growth rate of the money supply in 1932?

END