PART I: MULTIPLE CHOICE [20 QUESTIONS EACH WORTH 2 MARKS]

1. In a factor model, the return on a stock in a particular period will be related to

A) factor risk.
B) non-factor risk.
C) standard deviation of returns.
D) both **a** and **b** are true.
E) none of the above are true.

2. Which of the following factors was used by Fama and French in their multi-factor model?

A) Return on the market index
B) Excess return of small stocks over large stocks
C) Excess return of high book-to-market stocks over low book-to-market stocks
D) All of the above factors were included in their model.
E) None of the above factors were included in their model.

3. The **expected** impact of unanticipated macroeconomic events on a security's return during the period is

A) included in the security's expected return.
B) zero.
C) equal to the risk free rate.
D) proportional to the firm's beta.
E) infinite.

4. Consider the multifactor model APT with two factors. Portfolio A has a beta of 0.75 on factor 1 and a beta of 1.25 on factor 2. The risk premiums on the factor 1 and factor 2 portfolios are 1% and 7%, respectively. The risk-free rate of return is 7%. The expected return on portfolio A is _____ if no arbitrage opportunities exist.

A) 13.5%
B) 15.0%
C) 16.5%
D) 23.0%
E) none of the above

7% + 0.75(1%) 1.25(7%)

5. The feature of the APT that offers the greatest potential advantage over the CAPM is the _____.

A) use of several factors instead of a single market index to explain the risk-return relationship
B) identification of anticipated changes in production, inflation and term structure as key factors in explaining the risk-return relationship
C) superior measurement of the risk-free rate of return over historical time periods
D) variability of coefficients of sensitivity to the APT factors for a given asset over time
E) none of the above

6. In the empirical study of a multi-factor model by Chen, Roll, and Ross, a factor that appeared to have significant explanatory power in explaining security returns was

A) the change in the expected rate of inflation
B) the risk premium on bonds
C) the unexpected change in the rate of inflation
D) industrial production
E) **b, c** and **d**

7. Black, Jensen, and Scholes examined the validity of the simple version of the CAPM and the zero beta version of the CAPM. Their empirical results were

A) fully consistent with the simple version of the CAPM.
B) fully consistent with the zero beta version of the CAPM.
C) not fully consistent with either the simple version of the CAPM or the zero beta version of the CAPM, but were more consistent with the simple version of the CAPM.
D) not fully consistent with either the simple version of the CAPM or the zero beta version of the CAPM, but were more consistent with the zero beta version of the CAPM.
E) none of the above.

8. The research by Fama and French suggesting that CAPM is invalid has generated which of the following responses?

A) Better econometrics should be used in the test procedure.
B) Estimates of asset betas need to be improved.
C) Theoretical sources and implications of research that contradicts CAPM needs to be reconsidered.
D) The single-index model needs to account for non-traded assets and the cyclical behavior of asset betas.
E) All of the above

9. Consider the regression equation:

$r_i - r_f = g_0 + g_1 b_1 + g_2 s^2(e_i) + e_{it}$

where:

$r_i - r_f$ = the average difference between the monthly return on stock **i** and the monthly risk-free rate
b_i = the beta of stock **i**
$s^2(e_i)$ = a measure of the nonsystematic variance of the stock **i**.

If you estimated this regression equation and the CAPM was valid, you would expect the estimated coefficient g_0 to be

A) 0
B) 1
C) equal to the risk-free rate of return
D) equal to the average difference between the monthly return on the market portfolio and the monthly risk-free rate
E) none of the above.

10. Tests of multifactor models indicate

A) the single-factor model has better explanatory power in estimating security returns.
B) macroeconomic variables have no explanatory power in estimating security returns.
C) it may be possible to hedge some economic factors that affect future consumption risk with appropriate portfolios.
D) multifactor models do not work.
E) none of the above is true.

11. Which of the following statements is true about models that attempt to measure the empirical performance of the CAPM?

A) The conventional CAPM works better than the conditional CAPM with human capital.
B) The conventional CAPM works about the same as the conditional CAPM with human capital.
C) The conditional CAPM with human capital yields a better fit for empirical returns than the conventional CAPM.
D) Adding firm size to the model specification dramatically improves the fit.
E) Adding firm size to the model specification worsens the fit.

12. Consider the Sharpe and Treynor performance measures. When a pension fund is large and has many managers, the _____ measure is better for evaluating individual managers while the _____ measure is better for evaluating the manager of a small fund with only one manager responsible for all investments.

A) Sharpe, Sharpe
B) Sharpe, Treynor
C) Treynor, Sharpe
D) Treynor, Treynor
E) Both measures are equally good in both cases.

13. Suppose a particular investment earns an arithmetic return of 10% in year 1, 20% in year 2 and 30% in year 3. The geometric average return for the year period will be _____.

A) greater than the arithmetic average return
B) equal to the arithmetic average return
C) less than the arithmetic average return
D) equal to the market return
E) cannot tell from the information given

14. Your return will generally be higher using the _____ if you time your transactions well and your return will generally be higher using the _____ if you time your transactions poorly.

A) dollar-weighted return method, dollar-weighted return method
B) dollar-weighted return method, time-weighted return method
C) time-weighted return method, dollar-weighted return method
D) time-weighted return method, time-weighted return method
E) cannot determine without more information

15. You want to evaluate three mutual funds using the Sharpe measure for performance evaluation. The risk-free return during the sample period is 6%. The average returns, standard deviations and betas for the three funds are given below, as is the data for the S&P 500 index.

	Average Return	Standard. Deviation	Beta
Fund A	24%	30%	1.5
Fund B	12%	10%	0.5
Fund C	22%	20%	1.0
S&P 500	18%	16%	1.0

The fund with the highest Sharpe measure is _____.

A) Fund A
B) Fund B
C) Fund C
D) Funds A and B are tied for highest
E) Funds A and C are tied for highest

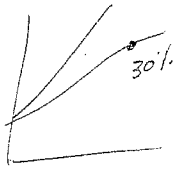
16. In measuring the comparative performance of different fund managers, the preferred method of calculating rate of return is _____.

A) internal rate of return
B) arithmetic average
C) dollar-weighted
D) time-weighted
E) none of the above

Use the following to answer questions 17-18:

The following data are available relating to the performance of Diamond Stock Fund and the market portfolio:

	Diamond	Market Portfolio
Average Return	18%	14%
Standard Deviation of Returns	30%	22%
Beta	1.4	1.0
Residual standard deviation	4.0%	0.0%



The risk-free return during the sample period was 6%.

22.
14.2

17. If you wanted to evaluate the Diamond Fund using the M^2 measure, what percent would need to be invested in Diamond Fund to give the adjusted portfolio the same risk as the market?

A) -36% (borrow)
B) 50%
C) 8%
D) 36%
E) 73%

18. Calculate the M^2 measure for the Diamond Fund.

A) 4.0%
B) 20.0%
C) 2.86%
D) 0.8%
E) 40.0%

19. Exchange rate risk

A) results from changes in the exchange rates in the currencies of the investor and the country in which the investment is made.
B) can be hedged by using a forward or futures contract in foreign exchange.
C) cannot be eliminated.
D) **a** and **c**.
E) **a** and **b**.

20. When an investor adds international stocks to her portfolio

A) it will raise her risk relative to the risk she would face just holding U.S. stocks.
B) she can reduce its risk relative to the risk she would face just holding U.S. stocks.
C) she will increase her expected return, but must also take on more risk.
D) it will have no significant impact on either the risk or the return of her portfolio.
E) she needs to seek professional management because she doesn't have access to international stocks on her own.

PART II ANSWER ONLY 1 QUESTION IN THIS PART (15 MARKS)

QUESTION 1 [see instruction #3] (15 Marks)

Answer the following questions on William Sharpe's article "Asset Allocation: Management Style and Performance Measurement", [Journal of Portfolio Management, Winter 1992, Pp. 7-19]:

1. What are the factors Sharpe used to explain returns in his model?

2. Explain why Sharpe went through 3 iterations to determine the coefficients of his factors.

2. How can Sharpe's model be used to evaluate a mutual fund's style and performance over time?

QUESTION 2 [see instruction #3] (15 Marks)

1. In the article, "Sorting Out Risks Using Known APT Factors", [Financial Analysts Journal, March-April 1988, pp. 29-42] by Berry, Burmeister and McElroy the authors state that legitimate risk factors must possess 3 important properties. What are these properties?

2. Explain what is the Type-5 risk factor in the Berry, Burmeister and McElroy model and how this risk is measured?

3. The Type-3 risk factor in the Berry, Burmeister and McElroy model is inflation. What is the appropriate Beta value for this risk? Explain your answer.

PART III ANSWER ONLY 1 QUESTION IN THIS PART (15 MARKS)

QUESTIONS 3 [see instruction #3] (15 Marks)

Discuss the objectives, methodology, findings and applications of the following article:

McQueen, Grant and Steven R. Thorley, "Mining Fool's Gold", Financial Analysts Journal, Mar/Apr 1999, pp. 61-72.

QUESTIONS 4 [see instruction #3] (15 Marks)

Discuss the objectives, methodology, findings and applications of the following article:

Bauman, W. Scott et al, "Growth versus Value and Large-Cap versus Small-Cap in International Markets", Financial Analysts Journal, Mar/Apr 1998, pp. 75-89

PART IV ANSWER 2 OUT OF 3 QUESTIONS IN THIS PART (30 MARKS)

QUESTION 5 [see instruction #4] (15 Marks)

1. What were the 3 reasons the Pegasus Pension Fund wanted to invest outside Canada?

2. Explain the following model that was proposed to Pegasus:

$$PREM_t^{loc} = \beta_0 + \beta_1 JAN_t + \beta_2 DIV_{t-1} + \beta_3 SHT_{t-1} + \beta_4 TERM_{t-1} + \beta_5 STKRET_{t-1} + \beta_6 USDIV_{t-1} + \beta_7 USTERM_{t-1} \quad (1)$$

3. Explain how the following table was derived and interpret the results in the rows: 1. Top Country; 2. Top 10 countries; 3. MSCI World Index and 4. Canadian Index

International Application of the Tactical Asset Allocation Model January 1974 to May 1994[1]

Portfolio	Annualized Canadian Dollar Return (% p.a.)	Annualized Standard Deviation Risk (% p.a.)	Sharpe Ratio (% p.a.)	Months Model Return > MSCI World Index (%)	Months Model Return > Canadian Index (%)	Average Portion of Portfolio in T-bills (%)	Monthly Portfolio Turnover (%)
Top Country	21.26*	23.81**	0.483	48.57	51.02	0.41	66.53
Top 2 Countries	19.45*	20.14**	0.481	52.65	55.51	0.82	51.22
Top 3 Countries	18.53*	17.92**	0.489	53.47	57.96	1.36	44.90
Top 4 Countries	19.45**	16.83**	0.575	54.29	56.33	2.24	39.18
Top 5 Countries	18.32*	15.97*	0.535	53.88	56.33	3.84	35.27
Top 6 Countries	18.65**	15.21	0.584*	54.29	55.92	6.80	31.97
Top 7 Countries	18.36**	14.42	0.596*	55.92	53.88	10.20	29.68
Top 8 Countries	18.10**	13.62	0.612**	56.33	54.29	14.29	27.24
Top 9 Countries	17.61*	12.93**	0.606**	55.51	54.29	19.00	26.26
Top 10 Countries	17.20	12.08**	0.615**	55.10	55.10	24.29	24.73
Top 11 Countries	16.60	11.34**	0.602**	53.47	55.51	29.28	23.23
Top 12 Countries	16.26	10.56**	0.615**	53.47	55.51	34.22	21.84
Top 13 Countries	15.99	9.83**	0.633**	55.06	56.33	38.71	20.41
Top 14 Countries	15.66	9.23**	0.638**	51.02	56.33	42.80	19.10
MSCI World Index	14.80	14.26	0.353	-	-	-	-
Canadian Stock Index	11.14	17.76	0.077	-	-	-	-
Canadian T-bill	9.77	0.90	-	-	-	-	-

[1] Note: ** indicates statistically different from the MSCI World index benchmark portfolio at ≥ 95% confidence; and * indicates statistically different with ≥ 90% confidence. All performance numbers are reported in Canadian currency. Returns are annualized by multiplying monthly returns by twelve.

QUESTION 6 [see instruction #4] (15 Marks)

1. What are the 2 main objectives of the Hewlett Foundation's [HF] Investment Policy?

2. How and why did HF come up with their new recommended asset allocation policy?

3. What were the risk and return achieved by HF on their investments in absolute return strategies?

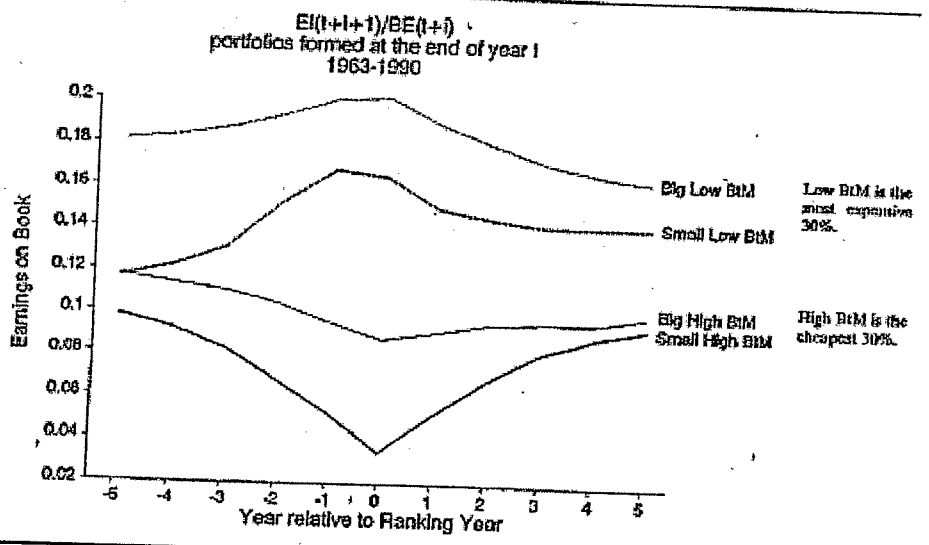
4. Explain how the equitization and bondization return overlay program works and what it might accomplish.

QUESTION 7 [see instruction #4] (15 Marks)

1. What is the DFA 9-10 Portfolio? Explain how DFA selects and purchases the securities for this portfolio and discuss the performance of this portfolio?

2. Explain the following Figure and its significance.

Exhibit 10 Earnings on Book Equity



3. Explain the equation, the setup and the results in the Table on the next and last page of this questionnaire.

[REMEMBER TO: Number the pages of your answer book[s].

Complete the Table of Contents on the front page of the questionnaire.

SIGN AND RETURN THE COMPLETE QUESTIONNAIRE [INSIDE YOUR BOOKLET].

Exhibit 4

Regressions on the Excess Returns of 25 Portfolios

Formed on Size and Book-to-Market Equity on the Excess Return on the Market Portfolio and on the Returns on the Portfolios for Size and Book-to-Market Equity: 7/63-12/90 Obs=330

$$R(t) - RF(t) = a + b\,[RM(t)-RF(t)] + sSMB(t) + hHML(t) + e(t)$$

equation setup results

		Book-to-Market (lowest) 1	2	3	4	(highest) 5	Book-to-Market (lowest) 1	2	3	4	(highest) 5
		average excess return: a					t(a)				
(smallest)	1	-0.37	-0.07	-0.00	0.06	0.05	-3.33	-0.88	-0.11	0.89	0.70
	2	-0.05	-0.06	0.05	0.09	-0.00	-0.55	0.74	0.60	1.24	-0.03
Size	3	-0.07	0.14	-0.07	0.15	0.04	-0.82	1.63	-0.84	1.96	0.44
	4	0.11	-0.09	-0.05	0.07	0.03	1.26	-1.07	-0.56	0.71	0.27
(largest)	5	0.19	-0.08	-0.09	-0.09	-0.03	2.73	-1.13	-1.03	-1.14	-0.29
		sensitivity to market (beta): b					t(b)				
(smallest)	1	1.02	0.99	0.92	0.89	0.94	36.68	48.94	52.75	55.63	52.60
	2	1.10	1.05	1.00	1.00	1.08	50.21	56.06	52.67	54.04	57.24
Size	3	1.10	1.01	1.00	0.98	1.07	52.60	48.36	47.14	50.21	47.80
	4	1.06	1.08	1.03	1.02	1.22	48.92	50.71	44.86	40.86	43.04
(largest)	5	0.95	1.00	0.99	0.98	1.05	56.08	55.26	43.99	50.86	39.64
		sensitivity to size: s					t(s)				
(smallest)	1	1.40	1.23	1.16	1.12	1.20	36.03	43.54	47.55	49.93	48.23
	2	1.00	0.97	0.84	0.75	0.92	32.73	36.90	31.49	29.02	34.88
Size	3	0.73	0.67	0.61	0.49	0.66	24.84	22.79	20.69	18.00	21.25
	4	0.37	0.31	0.28	0.24	0.45	12.10	10.58	8.60	6.98	11.33
(largest)	5	-0.15	-0.12	-0.20	-0.16	-0.07	-6.12	-4.62	-6.42	-5.94	-1.78
		sensitivity to BtM: h					t(h)				
(smallest)	1	-0.27	0.07	0.23	0.38	0.63	-5.78	1.93	7.81	14.03	20.73
	2	-0.51	0.02	0.22	0.40	0.70	-13.70	0.52	6.71	12.87	21.94
Size	3	-0.38	-0.04	0.28	0.47	0.70	-10.66	-1.11	7.81	14.38	18.46
	4	-0.44	0.03	0.30	0.53	0.74	-11.99	0.81	7.67	12.42	15.39
(largest)	5	-0.46	0.00	0.22	0.54	0.74	-15.87	0.18	5.65	16.51	17.05
		correlation: R^2					s(e)				
(smallest)	1	0.93	0.96	0.96	0.96	0.96	1.97	1.43	1.24	1.14	1.26
	2	0.95	0.96	0.95	0.95	0.96	1.54	1.32	1.34	1.31	1.33
Size	3	0.95	0.93	0.92	0.93	0.92	1.48	1.48	1.50	1.37	1.58
	4	0.93	0.92	0.90	0.87	0.89	1.53	1.50	1.63	1.76	2.00
(largest)	5	0.94	0.92	0.87	0.89	0.84	1.20	1.28	1.59	1.36	1.87

30