QUESTION ONE

(a) Define the following terms as used in asset management
   i. Portfolio.
   ii. Certificate of deposit.
   iii. Money weighted rate of return.
   iv. Performance monitoring.
   v. Investment appraisal.

[5 marks]

(b) A pension funds assets were invested with two fund managers. On 1 January 2007 Manager A was given 120,000 and Manager B was given 100,000. A further 10,000 was invested with each manager on 1 January 2008 and again on 1 January 2009. The values of the funds were:

	31 December 2007	31 December 2008	31 December 2009
Manager A	130,000	135,000	180,000
Manager B	140,000	145,000	150,000

   i. Calculate the time-weighted rates of return earned by Manager A and Manager B over the period 1 January 2007 to 31 December 2009.

[4 marks]

   ii. Show that the money-weighted rate of return earned by Manager A over the period 1 January 2007 to 31 December 2009 is approximately 9.4% per annum. [2 marks]

(c) Consider the following cash inflows from an investment today

Year	Cash inflows
1	3000
2	0
3	2500

If the rate of the capital is 5%, what is the investment worth today. [3 marks]

(d) Explain the differences between
   i. Money market and capital market. [2 marks]
   ii. Primary market and secondary market. [2 marks]

(e) The present value is the most valid and the true concept of value. Discuss. [6 marks]

(f) The value of the assets held by a pension fund on 1 January 2010 was 10 million. On 30 April 2010, the value of the assets had fallen to 8.5 million. On 1 May 2010, the fund received a contribution payment of 7.5 million and paid out 2 million in benefits. On 31 December 2010, the value of the fund was 17.1 million.

   i. Calculate the annual effective money-weighted rate of return (MWRR) for 2010. [3 marks]

   ii. Calculate the annual effective time-weighted rate of return (TWRR) for 2010. [3 marks]

QUESTION TWO

(a) Describe the characteristics of Eurobonds. [3 marks]

(b) An investor owns a portfolio of four securities. The following information is available

Security	Beta	Proportion,%	Return rate,%
A	1.4	30	13
B	0.9	30	18
C	1.0	20	10
D	-1.3	20	12

   i. What is the expected rate of return for this portfolio? [3 marks]

   ii. Find the beta of the portfolio. [2 marks]

   iii. Find the variance of the rate of return for this investment. [5 marks]

(c) A speculator borrows 50,000 at an effective interest rate of 8% per annum to finance a project that is expected to generate 7,500 at the end of each year for the next 15 years. Find the discounted payback period for this investment. [5 marks]

(d) Describe the characteristics of convertible bonds. [4 marks]

QUESTION THREE

(a) Given a portfolio of three securities A, B and C with the following information

Security	Amount invested,$	Average rate%	Beta
A	5000	9	8.8
B	5000	10	1.0
C	10000	11	1.2

   i. What are the weights of each of the three securities? [2 marks]

   ii. What is the average return on the portfolio? [2 marks]

   iii. If the risk free rate is 3% and the market return is 12%, what is the required return on the portfolio using the CAPM? [2 marks]

(b) The force of interest, $\delta(t)$, is a function of time and at any time t, measured in years, is given by the formula

$$A_{(t)} = A_0 \exp \int \delta \, dt$$

$$d = \frac{1}{1+i}$$

$$\delta(t) = \begin{cases} 0.04 + 0.003t^2, & 0 < t < 5; \\ 0.01 + 0.03t, & 5 < t. \end{cases}$$

   i. Calculate the amount to which 1,000 will have accumulated at $t = 7$ if it is invested at $t = 3$. [4 marks]

   ii. Calculate the constant rate of discount per annum, convertible monthly, which would lead to the same accumulation as that in (i) being obtained. [3 marks]

(c) A fund had a value of 2.0 million on 1 January 2013. On 1 May 2013, 2.5 million was invested. Immediately before this investment, the value of the fund was 2.1 million. At the close of business on 31 December 2013, the value of the fund was 4.2 million.

   i. Calculate the annual effective time-weighted rate of return for 2013. [2 marks]

   ii. Calculate the annual effective money-weighted rate of return for 2013. [3 marks]

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iii. Comment on your answers to parts (i) and (ii). [2 marks]

QUESTION FOUR

(a) Consider the following probability distribution

Security	Probability(%)	Net income(M)
A	20	1
B	30	2
C	40	3
D	10	4

What is the expected net income and the standard deviation of the net income? [6 marks]

(b) For each of the projects outlined below, calculate:

  i. the internal rate of return.

  ii. the range of interest rates at which money can be borrowed in order for the projects to be viable.

  iii. the accumulated profit at the end of 5 years, assuming that the projects are financed by a loan subject to interest at 6.25%.

Project C Initial outlay 100,000
Proceeds (at the end of 5 years) 140,000
Project D
Initial outlay 100,000
Proceeds (at the end of each of the next 3 years) 38,850. [8 marks]

(c) Distinguish between passive and active portfolio management. [6 marks]

QUESTION FIVE

(a) You have a portfolio of equally valued investments in two companies A and B. The beta of this portfolio is 1.2. Suppose you sell one of the companies, which has a beta of 0.4 and invest the proceeds in a new stock with a beta of 1.4. What is the beta of your new portfolio. [5 marks]

(b) Stocks A and B have the following returns over the past five years.

Year	A return(%)	B return(%)
1	8	10
2	9	12
3	14	18
4	16	20
5	20	14

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Find the

    i. Expected return for each stock.   [2 marks]

    ii. Variances of each stock.   [4 marks]

    iii. Covariance for the stocks.   [2 marks]

    iv. Correlation coefficient between the stocks and comment on your answer. [2 marks]

(c) Discuss the THREE forms of market efficiency under efficient market hypothesis.[5 marks]