ExamFM(FinancialMathematics)StudyNoteFall2006

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Exam FM Financial MathematicsThe examination for this material consists of two hours of multiple-choice questions and is identical to CAS Exam 2.The goal of the Financial Mathematics course of reading is to provide an understanding of the fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, asset/liability management, investment income, capital budgeting and valuing contingent cash flows. The following learning outcomes are presented with the understanding that candidates are allowed to use specified calculators on the exam. The education and examination of candidates should reflect that fact. In particular, such calculators eliminate the need for candidates to learn and be examined on certain mathematical methods of approximation. LEARNING OUTCOMESCandidates will know definitions of key terms of financial mathematics: inflation. rates of interest [simple, compound (interest and discount), real, nominal, effective, dollar-weighted, time-weighted, spot, forward], term structure of interest rates. force of interest (constant and varying). equivalent measures of interest. yield rate. principal. equation of value. present value. future value. current value. net present value. accumulation function. discount function. annuity certain (immediate and due). perpetuity (immediate and due). stocks

(common and preferred). bonds (including zero-coupon bonds). other financial instruments such as mutual funds, and guaranteed investment contracts.Specifically, candidates are expected to demonstrate the ability to:Choose the term, given a definitionDefine a given termDetermine an equation of value, given a valuation problem involving one or more sets of cash flows at specified timesCandidates will understand key procedures of the financial mathematics: determining equivalent measures of interest. discounting. accumulating. determining yield rates. estimating the rate of return on a fund. amortizationSpecifically, candidates are expected to demonstrate the ability to:Calculate the equivalent annual effective rate of interest, given a nominal annual rate and a frequency of interest conversion, discrete or continuous, other than annual.Calculate the equivalent effective rate of interest per payment period given a payment period different from the interest conversion period.Estimate the interest return on a fundCalculate the appropriate equivalent single value (present value, net present value, future (accumulated) value or combination), given a set of cash flows (level or varying), an appropriate term structure of interest rates, the method of crediting interest (e.g., portfolio or investment year) as necessary, an appropriate set of inflation rates as necessary, and accounting for reinvestment interest rates as necessary. for example:Calculate the loan amount or outstanding loan balance, given a set of loan payments (level or varying) and the desired yield rate (level or varying)Calculate the price of a bond (callable or non-callable), given the bond coupons, the redemption value, the

term of the bond (constant or varying), the coupon interest rate, and the desired yield rate (level or varying)Calculate the value of a stock, given the pattern of dividends and the desired yield rate (level or varying)Calculate the net present value, given a set of investment contributions and investment returnsCalculate a unique yield rate, when it exists, given a set of investment cash flowsCalculate the amount(s) of investment contributions, given there is more than one contribution, and given a set of yield rates, the amount(s) and timing of investment return(s), and the desired timing of the investment contributions 100Test