



MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER

SCHOOL OF BUSINESS AND ECONOMICS

BACHELOR OF SCIENCE IN FINANCIAL ECONOMICS

COURSE CODE: ECF 4105

COURSE TITLE: FINANCIAL MODELLING

DATE: DECEMBER 2023

TIME

INSTRUCTIONS TO CANDIDATES

Answer Question **ONE** and any other **TWO** questions

SECTION A (20 MARKS)

1. (a) Your client has tasked you to develop and operationalize a comprehensive financial model for their business. What steps would you follow in developing the financial model. [5 marks]
- (b) Let i_t^f denote the one-period forward rate of interest over the year from time $t - 1$ to time t as shown in the table below. A fixed interest security pays coupons annually in arrears at the rate of 7% per annum and is redeemable at par in exactly four years.

Time (t)	1	2	3	4
i_t^f	4.4	4.7	4.9	5.0

- i Calculate the price per *shs* 100 nominal of the security assuming no arbitrage. [4 marks]
- ii Calculate the gross redemption yield of the security. [3 marks]
- iii Explain, without doing any further calculations, how your answer to part (b) would change if the annual coupon rate on the security were 9% per annum (rather than 7% per annum). [2 marks]
- (c) You are offered an investment that will return you three \$7000 payments. The first payment will occur three years from today. The second will occur in six years from today, the third will follow in the following year. If you can earn 9% p.a
- i What is the most this investment is worth today? [3 marks]
- ii What is the future value of the cash flows after seven years? [3 marks]

SECTION B (15 MARKS EACH)

2. (a) The directors of ABC Boats Ltd are interested in a new type of rowing boat that ejects a rower when they are exhausted. This new project has caused a lot of controversy but the directors believe that they can sell 50 units per year to countries that compete in the sport of international rowing. The selling price will be \$50 000 per unit and the variable costs per unit will be 40% of revenue. The product should have a 4-year life. The directors require a 20 percent return on new products such as this one. Fixed cost for the project will be \$750 000 per year. The company will need to invest a total of \$1,500,000 in manufacturing equipment. This equipment may be depreciated at 15% straight line. In 4 years, the equipment will be worth half of what the company paid for it. The corporate tax rate is 30%

Required

- i Prepare a table of Cash Flows [6 marks]
- ii Calculate
- A. Net Present Value [3 marks]
- B. Internal Rate of Return [3 marks]

C. Payback Period

[3 marks]

3. (a) Roberto Enterprises is concerned that exporting to South East Asia will impact on its share price and is seeking a full analysis of the determinants of share price. At the moment the company has a risk return rating on its shares of 15.5%, determined by using a beta factor of 1.25. The risk free rate is 5.5%
- i What is the risk premium for Roberto Enterprises? [2 marks]
 - ii What is the market risk premium? [2 marks]
 - iii Two examples of market risk that face Roberto Enterprises [2 marks]
 - iv What risk is measured by beta? [1 marks]
 - v What does a beta of 1.25 inform shareholders about the risk of Roberto Enterprises? Explain your answer [2 marks]
 - vi Should shareholders be compensated for bearing the total risk associated with the returns of the individual company? [2 marks]
 - vii Draw the Security Market Line (SML) diagram and identify the position of Roberto Enterprises, market portfolio and risk free rate (Label all the axes). [4 marks]
4. (a) Highlight the key assumptions in an ordinary least squares model [5 marks]
- (b) The manager of Dairy cool Creameries has approached you for some consultation on their daily sales of icecream. The table below gives their daily sales of icecream against the average daily temperatures.

Temperature(in degress celcius)	5	7	6	8	10	9	7	8
Sales(in 1000's of shillings)	8	10	8	13	15	14	11	9

- i Fit an ordinary least squares model to the data and explain the variables [7 marks]
- ii The weather forecast predicts that the average daily temperature for next Tuesday will be $11^{\circ}C$. Compute the expected sales. [3 marks]

THE END