



# **MAASAI MARA UNIVERSITY**

**REGULAR UNIVERSITY EXAMINATIONS**

**2021/2022 ACADEMIC YEAR**

**FOURTH YEAR FIRST SEMESTER**

**SCHOOL OF BUSINESS AND ECONOMICS**

**BACHELOR OF COMMERCE**

**COURSE CODE: ECF 4105**

**COURSE TITLE: FINANCIAL MATHEMATICS**

**DATE: 31<sup>ST</sup> MARCH, 2022**

**TIME: 1100-1300**

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**INSTRUCTIONS TO CANDIDATES**

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

*This paper consists of **two** printed pages. Please turnover.*

### Question one

- a) Discuss the two main risks associated with use of derivatives (4 marks)
- b) Describe the two finance decisions made by finance manager (9 marks)
- c) Mr. Wema has won a litigation case and is expecting to receive sh. 10,000 at the end of each year for the next 30 years. What is the present value of sh. 10,000 due to be received at the 7% discount rate? (4 marks)
- d) Enumerate and evaluate any four major causes of conflict between shareholders and management (8 marks)

### Question two

- a) Explain the factors that determine interest rates in an economy (5 Marks)
- b) One of the theories used to explain the behavior of interest rates is the term structure of interest rates. Using your knowledge of this course explain the term structure of interest rates. Clearly identify the explanation that meets all the 3 criteria as per the term structure of interest rates (10 Marks)

### Question three

Jambo manufactures Ltd is contemplating the purchase either of two machines at a cost of Sh. 155 million and Sh. 180 million respectively. The machines will generate cash flows receivable at the end of each respective year as follows:

	<b>Machine A</b>	<b>Machine B</b>
<b><u>Year</u></b>	<b><u>Cash flow (Sh. Millions)</u></b>	<b><u>Cash flow (Sh. Millions)</u></b>
1	55	90
2	35	85
3	(35)	55
4	68	46

5	72	37
6	41	

Machine A has an estimated salvage value of Sh. 40 million at the end of year six. Machine B would cost Jambo an estimated Sh. 10 million to dispose off at the end of year five. Jambo has a cost of capital of 15% per annum.

- i. Using NPV approach, advice Jambo as to which of the machines, if any, it should invest in. **(8 marks)**
- ii. Due to the likelihood of technological changes, Jambo would prefer to invest in machines with a payback period not exceeding four years. Using the payback approach, which of the machines, if any, should Jambo invest in? **(4 marks)**
- iii. What are some of the shortcomings of the payback approach to capital project evaluation? **(3 marks)**

#### Question Four

- a) Distinguish between a put and a call option **(3 marks)**
- b) The following data relate to call options on two shares A and B

	Calls	
	A	B
Months to expiration	3	9
Risk free rate	10%	10%
Standard deviation of stock returns	40%	40%
Exercise price	Ksh.55	Ksh.55
Stock price	Ksh.50	Ksh.50
Required		

- i) Calculate the price of call option A and B **(9 marks)**
- ii) Of the two call options which would you expect to have a higher price?  
Why? (Do not compute) **(3 marks)**

**Question five**

Delphi Products Corporation currently pays a dividend of Sh. 2 per share and the dividend is expected to grow at a rate of 15% per year for 3 years, then at a 10% rate for the next 3 years, after which it is expected to grow at a rate of 5% rate forever.

**Required:**

- a) Determine the value of the stock if a required rate of return is 18% is desired. **(8 marks)**
- b) Would your valuation change if the asset is held for 3 years? **(4 marks)**
- c) Explain the determinants of share prices of a company. **(3 marks)**

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