



**TECHNICAL UNIVERSITY OF MOMBASA**  
*School of Business*  
DEPARTMENT OF ACCOUNTING AND FINANCE  
UNIVERSITY EXAMINATIONS FOR DEGREE IN  
BACHELOR OF SCIENCE IN MATHEMATICS AND FINANCE  
**BMS 4151: MATHEMATICAL FINANCE**

MAIN EXAMINATIONS  
**SERIES: APRIL 2022**  
**TIME: 2 HOURS**

**INSTRUCTIONS:**

Answer Question **ONE (Compulsory)** and any other **TWO** questions

*This paper consists of Four printed pages*

---

**QUESTION 1 (Compulsory)**

- a) Bwana Mkate who has a capital of Ksh 700,000 is considering whether to invest in a small kiosk for seven years. The after-tax cost of capital is expected to be 11%. The hotel is expected to generate Cashflows of Ksh 145,000 per year for the first four years. The annual cashflows will then reduce by 20% during the fifth year and increase by Ksh 50,000 in each of the last two years. The kiosk is expected to have a scrap value of Ksh 26,883.08 at the end of its useful economic life

**Required:**

Advise Bwana Katana on which investment to make based on the following methods:

- |       |                              |           |
|-------|------------------------------|-----------|
| (i)   | Payback Period               | (3 Marks) |
| (ii)  | Net Present Value            | (8 Marks) |
| (iii) | Profitability Index          | (3 Marks) |
| (iv)  | Non-financial considerations | (6 Marks) |

- b) The following cash flows were projected by Kitimoto Limited:

Year	Cash-flows (Ksh)
1	390,000
2	1,140,000

3	1,820,000
4	(1,250,000)
5	1,110,000
6	1,780,000

Discounting rate 14%

**Required:**

Compute the present value and future value of the cash-flows. (10 Marks)

**QUESTION 2**

The following information was extracted from the books of Congo Ltd for the year ending 31<sup>st</sup> December 2020.

	Ksh 000
Accounts receivable	30,000
Accounts Payable	24,000
Inventories	22,500
Credit sales	146,000
Credit purchases	91,250

Required

- Compute the company's cash conversion cycle in days (12 Marks)
- Describe the implication of the conversion cycle and suggest any four ways of improving it (8 Marks)

**QUESTION 3**

- The capital structure of Chenje Limited is given below:

	Sh. "million"
6,000,000 fully paid ordinary shares	60
Retained earnings	40
2,000,000 8% preference shares	30
400,000 10% long term debentures	<u>70</u>
	<u>200</u>

The company intends to raise additional finance as follows:

Sh. 50,000,000 from issuing 8% debentures

Sh. 40,000,000 from selling new ordinary shares at a flotation cost of Sh. 2 per share

The current market value of each ordinary share is Sh. 40. The shareholders expect a dividend of Sh. 5 share next year. The dividends grow at the rate of 12% per annum into perpetuity. The debentures of the company have a face value of Sh. 100 each with market value of Sh. 150. The company's tax rate is 30%.

**Required:**

- The company's weighted average cost of capital (WACC) (6 marks)
  - The marginal cost of capital (6 marks)
- Describe Dividend Discounting Model (DDM) as used in cost of equity calculations and valuation of securities and state its main assumptions. (8 Marks)

#### QUESTION 4

- a) BibiYai ltd. Shares of are very competitive in the market. The company declared a dividend of Ksh 4.18 during the last financial year. The dividend is expected to grow at a rate of 18% for the first 3 years, then at 14% for the following 3 years. Thereafter the growth will be at a constant rate of 8% indefinitely. The company's required rate of return is 12%.

**Required:**

- i. Calculate the intrinsic value of the ordinary share (5 marks)
  - ii. Describe he assumptions of the model used to value the shares (3 Marks)
- b) The following financial statements were obtained from the books of Mapeni Ltd. The net profit for the year 2019 was Ksh 22,500.

Statement of Financial Position As at 31<sup>st</sup> December 2019

	Sh.
30,000 ordinary shares of @ 200	300,000
Retained earnings	42,500
10% debentures	90,000
Payables	47,500
Bank overdraft	20,000
	<u>500,000</u>
Fixed assets	250,000
Inventory	75,000
Receivables	125,000
Cash	50,000
	<u>500,000</u>

**Required:**

Compute and interpret the following ratios:

- i). Debt equity ratio (3 Marks)
- ii). Acid test ratio (3 Marks)
- iii). Earnings per share (3 Marks)
- iv). Return on Assets . (3 Marks)

#### QUESTION 5

- a) Investments requires finances. Explain any Four sources of Finance available to investors clearly describing their distinguishing characteristics (10 marks)
- b) Explain any four types of decisions that finance managers may make and how they can be affected by biases. (10 Marks)