



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

SUPPLEMENTARY EXAMINATIONS

SERIES: JULY 2025

TIME: 2 HOURS

INSTRUCTIONS:

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

This paper consists of Three printed pages

QUESTION 1 (Compulsory)

GenZ Engineering Limited intends to establish a factory in Kwale at a cost of Ksh 888,000,000. The company is being presented with finances from three financial institutions, with the repayment scheme as follows:

- Bank 1: An annual repayment of Ksh 127,244,155.81 for 15 years
- Bank 2: An annual repayment of Ksh 140,779,988.91 for 12 years
- Bank 3: An annual repayment of Ksh 155,538,952.66 for 10 years

The current prevailing interest rate is 11%

Required:

- Explain any Five sources of finance to fund available for GenZ Engineering Limited
(10 marks)
- Calculate the total interest payable under each Bank above and advise GenZ Engineering Limited on the best option to take (12 Marks)
- Explain the Four Main functions of Finance (8 Marks)

QUESTION 2

- Baba Dogo 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 15% for the first 3 years, then at 12% for the following 2 years.

Thereafter the growth will be at a constant rate of 7% indefinitely. The company's required rate of return is 10%.

Required:

- i. Calculate the intrinsic value of the ordinary share (5 marks)
 - ii. Describe the 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 31st 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
	500,000
Fixed assets	250,000
Inventory	75,000
Receivables	125,000
Cash	50,000
	500,000

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 3

Bwana Katana who has a capital of Ksh 800,000 is considering whether to invest in a hotel business for six years. The after tax cost of capital is expected to be 14%. The hotel is expected to generate Cashflows of Ksh 275,000 per year for the first three years. The annual cashflows will then reduce by 20% for the next three years. The hotel is expected to have a scrap value of Ksh 37,248.00

Required:

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

- a) Payback Period (3 Marks)
- b) Net Present Value (8 Marks)
- c) Profitability Index (3 Marks)
- d) Non-financial considerations (6 Marks)

QUESTION 4

- a) Discuss any FOUR Capital Market Financial Institutions. (12 marks)
- b) Discuss any FOUR financial instruments used in the money market (8 marks)

QUESTION 5

a) 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:

- i. The company's weighted average cost of capital (WACC) (6 marks)
- ii. The marginal cost of capital (6 marks)

b) Mudziagrzi Limited is currently issuing 9% bonds redeemable at Sh. 100 par value in five years' time. Alternatively, each bond may be converted on that date into 20 ordinary shares of the company. The current market price per share is Sh. 4.45 and this is expected to grow at the rate of 6.5% per annum for the foreseeable future. The company's cost of debt is 7% per annum.

Required:

- i. Market value of the bond (4 marks)
- ii. Floor Value of the bond (4 Marks)