

**UNIVERSITY OF ESWATINI**  
**DEPARTMENT OF ACCOUNTING AND FINANCE**  
**EXAMINATION PAPER OCTOBER 2021**  
**ACADEMIC YEAR 2020/2021**

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**PROGRAMME OF STUDY** : **Master of Business Administration**  
**YEAR OF STUDY** : **Year 1 (Part Time)**  
**TITLE OF THE PAPER** : **Investment Analysis and Portfolio Management**  
**COURSE CODE** : **ACF 624**  
**TIME ALLOWED** : **Three (3) Hours**

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**INSTRUCTIONS**

1. There are **FIVE (5)** questions; **ANSWER ALL THE QUESTIONS IN SECTION A AND ANY TWO (2) QUESTIONS IN SECTION B.**
2. The paper consists of seven (7) numbered pages, including this page and Appendix 1 which contains useful formulae.
3. Begin the solution to each question on a new page.
4. The marks awarded for a question are indicated at the end of each question.
5. Show your necessary workings.

**NOTE:** You are reminded that in assessing your work, account will be taken of accuracy of the language and the general quality of expression, together with layout and presentation of your answer.

**THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR / SUPERVISOR.**

**SPECIAL REQUIREMENT: FINANCIAL CALCULATOR / SCIENTIFIC CALCULATOR**

**SECTION A - COMPULSORY****(50 Marks)****ANSWER ALL THE QUESTIONS IN THIS SECTION****QUESTION ONE****(25 Marks)**

Axe Dee Limited is considering putting together a portfolio containing two assets; T and B. Asset T will represent 45% of the rand value of the portfolio, and asset B will account for the other 55%. The expected returns over the next five years, 2016 to 2020, for each of these assets, are given below in Table 1.1:

Year	Expected Return	
	Asset T (%)	Asset B (%)
2016	19	-8
2017	8	3
2018	-12	-9
2019	-3	2
2020	15	4

**Table 1.1****Required:**

- 1.1 Calculate the expected portfolio return,  $E(R_p)$  for each of the five years. **(6 Marks)**
- 1.2 Calculate the expected value of the portfolio returns over the 5-year period. **(4 Marks)**
- 1.3 Calculate the standard deviation of expected portfolio returns over the 5-year period. **(6 Marks)**
- 1.4 Calculate the arithmetic mean annual rate of return for each stock. Which stock is most desirable by this measure? **(3 Marks)**
- 1.5 Calculate the geometric mean rate of return for each stock. Highlight the key differences between the arithmetic mean return and the geometric mean return for each stock. **(6 Marks)**

**QUESTION TWO****(25 Marks)**

Assuming that you have E1 000 000 to invest in a portfolio of two risky securities plus a riskless asset. The following information in Table 2.1 contains three stocks that are in different industries.

State of Economy	Probability of State	Return on Stock X	Return on Stock Y	Return on Stock Z	Riskless Asset
Depression	15%	-15%	-5.0%	-10%	1.25%
Recession	20%	-5.0%	10.0%	-12%	2.5%
Normal	25%	10.0%	15.0%	14.0%	4.5%
Boom	40%	25.0%	17.0%	18.0%	7.5%

**Table 2.1****Required:**

- 2.1 As a risk-averse investor, indicate which among the three shares you would choose. Motivate your answer with relevant calculations. **(15 Marks)**
- 2.2 Suppose that your wealth is allocated to these two stocks plus the riskless asset in the proportions of 45%, 25% and 30% respectively.

**Calculate:**

- 2.2.1 the expected return of the portfolio. **(5 Marks)**
- 2.2.2 the standard deviation or total risk of the portfolio. **(5 Marks)**

**SECTION B****(50 Marks)****ANSWER ANY TWO (2) QUESTIONS IN THIS SECTION****QUESTION THREE****(25 Marks)**

You have been named as investment adviser to a foundation established by Dr Andile Dlamini with an original contributing consisting entirely of the common stock of SBC Limited, founded by Wandile Fakudze, SBC Limited manufactures and markets medical devices invented by the doctor and collects royalties on other patented innovations.

All of the shares that made up the initial contribution to the foundation were sold a public offering of SBC Limited common stock, and the E5 million proceeds will be delivered to the

foundation within the next week. At the same time, Mrs Dlamini will receive E5 million in proceeds from the sale of her stock in SBC Limited.

Dr Dlamini's purpose in establishing the Dlamini Foundation was to 'offset the effect of inflation on medical school tuition for the maximum number of worthy students'.

You are preparing for a meeting with the foundation trustees to discuss investment policy and asset allocation.

3.1 In the context of the given extract, discuss the differences between an investment objective, an investment constraint, and the importance of the investment policy statement. **(10 Marks)**

3.2 The following portfolios in Table 3.1 are being considered for investment by Buhle. During the period under consideration  $R_f = 0.07$ .

Portfolio	Return	Beta	Standard Deviation
P	0.15	1.0	0.05
Q	0.20	1.5	0.10
R	0.10	0.6	0.03
S	0.17	1.1	0.06
Market	0.13	1.0	0.04

**Table 3.1**

**Required:**

3.2.1 Calculate the Sharpe and Treynor measures of performance for the above portfolios and the market. **(8 Marks)**

3.2.2 Rank the portfolios using each measure and indicate the measures by which Buhle's portfolio outperformed the market. **(5 Marks)**

3.2.3 If instead Buhle could invest only in Treasury Bills and one of these portfolios, which one portfolio would she choose? **(2 Marks)**

**QUESTION FOUR****(25 Marks)**

- 4.1 Consider the following Table 4.1, which gives a security analyst's expected return on two stocks for two particular markets returns.

Market Return (%)	Aggressive Stock (%)	Defensive Stock (%)
5	2	3.5
20	32	14

**Table 4.1****Required:**

- 4.1.1 Calculate the betas of the stocks. **(4 Marks)**
- 4.1.2 What are the expected rate of return on each stock if the market is equally likely to be 5% or 20%? **(4 Marks)**
- 4.1.3 If the T-Bill rate is 8%, and the market return is equally likely to be 5% or 20%, draw the security market line (SML) for this economy. **(3 Marks)**
- 4.1.4 Plot the two securities on the SML graph. What are the alphas of each stock? **(4 Marks)**
- 4.2 The Capital Asset Pricing Model (CAPM) is an equilibrium model *'which treats the problem of finding a set of mutually consistent equilibrium prices and expected rates of return across all stocks'*. In that context, discuss the CAPM and its role in measuring the performance of competing portfolio managers and its limitations. **(10 Marks)**

**QUESTION FIVE****(25 Marks)**

- 5.1 Rich McDonald Lukhele, is evaluating his investment alternatives in Ytel Incorporated by analyzing a Ytel convertible bond and Ytel common equity. The characteristics of the two securities are given in the following Table 5.1:

Characteristics	Convertible Bond	Common Equity
Par value	E1,000	-
Coupon (annual payment)	4%	-
Current market price	E980	E35 per share
Straight Bond Value	E925	-
Conversion ratio	25	-
Conversion option	At any time	-
Dividend	-	E0
Expected Market Price in 1 Year	E1,125	E45 per share

**Table 5.1**

**Required.**

- 5.1.1 Calculate the market conversion price for the Ytel convertible bond. **(3 Marks)**
- 5.1.2 Calculate the Expected one-year rate of return for the Ytel convertible bond. **(3 Marks)**
- 5.1.3 Expected one-year rate of return for the Ytel common equity. **(3 Marks)**
- 5.2 One year has passed and Ytel common equity price has increased to E51.00 per share. Also, over the year, the yield to maturity on Ytel's non-convertible bonds of the same maturity increased, while credit spreads remain unchanged.
- Name two components of the convertible bond's value. Indicate whether the value of each component should decrease, stay the same, or increase in response to the:
- 5.2.1 Increase in Ytel's common equity price **(3 Marks)**
- 5.2.2 Increase in bond yield. **(3 Marks)**
- 5.3 Critically discuss passive and active investment strategies and highlight the key distinction between these two strategies. **(10 Marks)**

## APPENDIX 1

- $$\text{HPR} := \frac{(Pe - P) + D}{Pb}$$

- $$\text{HPR}_{\text{AVL}} = \sum_{t=1}^T \left[ \text{HPR}_t \times \frac{P_t}{TV} \right]$$

- $$\sigma^2 = \sum P(s) \times [E_t - E(r)]^2$$

- $$\sigma = \sqrt{\sigma^2}$$

- $$E(R_i) = R_F + \beta_i [E(R_M) - R_F]$$

- Sharpe measure 
$$= \frac{r_p - r_f}{\sigma_p}$$

- Treynor measure 
$$= \frac{r_p - r_f}{\beta_p}$$

- Jensen (Alpha) 
$$\alpha_p = r_p - [r_f + \beta_p (r_m - r_f)]$$

- PV of a bond 
$$= C \left( \frac{1 - \frac{1}{(1+r)^t}}{r} \right) + \frac{FV}{(1+r)^t}$$

- $$E(r) = \sum_{t=1}^s p(s)r(s)$$

- $$\text{Var}(r) = \sigma^2 = \sum_{t=1}^s P(s)[r(s) - E(r)]^2$$

- $$SD(r) = \sigma = \sqrt{\text{Var}(r)}$$

- $$SD = \sqrt{W_A^2 SD_A^2 + W_B^2 SD_B^2 + W_C^2 SD_C^2 + 2W_A W_C SD_A SD_C R_{AC} + 2W_A W_B SD_A SD_B R_{AB} + 2W_C W_B SD_C SD_B R_{CB}}$$

END OF PAPER