ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF LAW, BUSINESS INTELLIGENCE AND ECONOMICS

DEPARTMENT OF ECONOMICS, MARKETING AND ENTREPRENEURSHIP

EXAMINATION PAPER

| | | |
|---|---|---|
| COURSE CODE | : | MSTM5218 |
| COURSE TITLE | : | INVESTMENT & PORTFOLIO MANAGEMENT |
| DURATION | : | 3 Hours |
| LEVEL | : | 1.2 |

30 JUL 2025

**INSTRUCTIONS TO CANDIDATES:**

1. No cell phones are allowed in the examination venue.
2. Use of silent, non-programmable calculators is allowed
3. Answer question number **one (1)** in Section A (Compulsory) and any other **three (3)** questions in Section B.
4. Begin each question on a new page.
5. The number of marks for each question or part question is shown in brackets [ ]
6. Show all workings, where applicable.

**Section A (Compulsory)**

**Question 1:**

Consider the following scenario involving LM, a producer of ice cream, and HH, a producer of sugar :

**Probability Distribution Table**

| | NORMAL YEAR FOR SUGAR | | ABNORMAL YEAR |
|---|---|---|---|
| | ***BULLISH STOCK MARKET*** | ***BEARISH STOCK MARKET*** | ***SUGAR CRISIS*** |
| ***PROBABILITY*** | *50%* | *30%* | *20%* |
| ***RATE OF RETURN*** | | | |
| ***HH*** | *30%* | *15%* | *-20%* |
| ***LM*** | *10%* | *5%* | *25%* |
| ***T-BILLS*** | *20%* | *20%* | *20%* |

***Calculate:***

a) The expected return and standard deviation of HH. **[5 marks]**

b) The expected return and standard deviation for LM. **[5 marks]**

c) The covariance between the returns of HH and LM. **[4 marks]**

d) The correlation coefficient. **[2 marks]**

e) The standard deviation of a portfolio in which you have invested 50% in T-bills, 25% in HH and 25% in LM. **[4 marks]**

f) The standard deviation and expected return of a portfolio in which you have invested 50% in HH and 50% in LM. **[5 marks]**

**[Total: 25 marks]**

**Question 2**

Discuss the five-step procedure of the investment management process **[25 marks]**

**Question 3**

a) Discuss the roles of five players in the investment environment **[25 marks]**

## Question 4

Given the following information about the 6 month performance of Airplays Corporation and the ZSE Index in Table 4.1 ;

**Table 4.1 Individual-Market returns**

| Month | Airplays Corporation-HPR (%) | ZSE Index- HPR (%) |
|---|---|---|
| JANUARY | 10 | 4 |
| FEBRUARY | 9 | 6 |
| MARCH | 12 | 9 |
| APRIL | 15 | 13.4 |
| MAY | 16 | 11 |
| JUNE | 8.9 | 11.5 |

a) Estimate the index model using Capital Asset Pricing Model **[17 marks]**

b) Comment on the significance of your results and illustrate your answer with a Security Characteristic Line (SCL). **[8 marks]**

## Question 5

An investor has gathered the following information about the Zimbabwean market

| | Bond Fund | Equity Fund |
|---|---|---|
| E( R) | 30% | 60% |
| | | |
| Standard Deviation | 25% | 45% |

Covariance between bonds and equities is - 125

Expected return on Treasury bills is 15%

Investor's risk aversion coefficient is 3

**Required**

a) Calculate the weight invested in
   i.the bond fund **[4 marks]**

ii.the equity fund , and [2 marks]

iii. the money market. [4 marks]

b) Calculate the expected return and standard deviation of the risky portfolio and the complete portfolio. [5 marks]

c) Calculate the Reward to Variability ratio supported by the risk free asset and the risky portfolio and comment on your results. [5 marks]

**Question 6**

You are given the following information about the economy in Zimbabwe

| State of the economy | Probability of state of the economy | Expected return, given state of the economy |
|---|---|---|
| Recession | 0.40 | 25% |
| Normal | 0.20 | 35% |
| Boom | 0.10 | 15% |
| Super boom | 0.30 | 20% |

**Required:**

a) Compute the expected return of the economy [6 marks]

b) Calculate the standard deviation of the economy [6 marks]

c) Interpret the results of the economy [6 marks]

d) Explain the significance of covariance and correlation coefficient in relation to portfolio diversification [7 marks]

**The End**

**Formulas: Investment Analysis and Portfolio Management**

1. $E(R_A)=\sum \Pr * R_A$

2. $\sigma_A{}^2=\sum\left[R_A-E(R_A)^2\right]\Pr$

3. $r_{A,B}=\dfrac{COV_{A,B}}{\sigma_A\sigma_B}$

4. $E(Rp)=E(Ri)Wi$

5. $\sigma^2 p=W^2{}_A\sigma^2{}_A+W^2{}_B\sigma^2{}_B 2COV_{A,B}W_AW_B$

6. $Y^*=\dfrac{E(Rp)-Rf}{0.01*A*\sigma^2 p}$

7. $Y=\dfrac{E(Rm)-Rf}{0.01*A*\sigma^2 p}$

8. $WD=\dfrac{[E(R_D)-Rf]\sigma^2{}_E-[E(R_E)-Rf]COV_{D,E}}{[E(R_D)-Rf]\sigma^2{}_E+[E(R_E)-Rf]\sigma^2{}_D-[E(R_D)-Rf+E(R_E)-Rf]COV_{D,E}}$

9. $\alpha=ER-[Rf+\beta E(Rm)]$

10. $R_i=\alpha+\beta_i Rm+e_i$

11. $\sigma^2 i=\beta^2 i\sigma^2 m+\sigma^2{}_{(ei)}$ Variance of the rate of return on a security

12. $COV\ (R_i Rm)=\beta i\sigma^2 m$

13. $\sigma^2(e_i)=\left(\dfrac{1}{n-2}\right)\sum_{t=1}^{n}e^2{}_t$ Variance attributable to firm specific factors

14. $\sigma^2{}_m=\dfrac{1}{n-1}\sum\left(RM-\bar{RM}\right)^2$ $\beta^2\sigma^2 m=$ Variance attributable to market forces

15. $\sigma^2(ep)=\sum_{t=1}^{n}\left(\dfrac{1}{n}\right)^2\sigma^2 e_i$

16. $\beta=\dfrac{\sum XY-\left(\sum X\sum Y\right)/n}{\sum X^2-\left(\sum X^2\right)/n}$

17. $\alpha=\bar{Y}-\beta\bar{X}$

18. $COV\ (ab)=\sum Pi\ [Ra-E(Ra)][Rb-E(Rb)]$

19 $\sigma^2=\sum\sum W_iW_j\ \sigma_{ji}$ ,