



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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## University Examinations 2013/2014

THIRD YEAR, TWO SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF  
COMMERCE

### HBC 2223: PORTFOLIO AND INVESTMENT ANALYSIS

DATE: APRIL 2014

TIME: 2 HOURS

**INSTRUCTIONS:** Answer question *one* and any other *two* questions

#### QUESTION ONE – (30MARKS)

- (a) Investments is not the same thing as speculation. Explain. (3 Marks)
- (b) Explain the following terms
- (i) Random walk theory (2 Marks)
  - (ii) Informational efficiency (2 Marks)
  - (iii) Fundamental analysis (2 Marks)
- (c) Explain five assumptions about investor behavior in the modern portfolio theory. (5 Marks)
- (d) After thorough analysis of both the aggregate market and stocks ABC and XYZ, you develop the following opinion.

|                  |     |     |     |     |     |
|------------------|-----|-----|-----|-----|-----|
| Probability      | 0.1 | 0.2 | 0.4 | 0.2 | 0.1 |
| Returns (%)      |     |     |     |     |     |
| Aggregate Market | 39  | 17  | 6   | -12 | -16 |
| ABC              | 6   | 8   | 10  | 12  | 4   |
| XYZ              | 14  | 12  | 10  | 8   | 6   |

At present the treasury bill rate is 9%

Required

- (i) Calculate the standard deviation on each stock and the market index. (3 Marks)

- (ii) Calculate the correlation coefficient for the returns of ABC Limited and XYZ Limited. (4 Marks)
- (iii) What percentage of investment in each stock would yield lowest risk in a portfolio made up of ABC and XYZ stocks. (3 Marks)
- (iv) Calculate the sensitivity of returns of ABC Limited to that of the aggregate market index. (3 Marks)
- (v) Would investment in ABC Limited be wise considering CAPM assumptions? (3 Marks)

**QUESTION TWO – (20 MARKS)**

- (a) Using examples, distinguish between systematic and unsystematic risk. (4 Marks)
- (b) Explain five limitations of Capital Asset Pricing Model (CAPM). (5 Marks)
- (c) An investor is evaluating four portfolios with the following characteristics.

| Portfolio | Portfolio expected Return (%) | Portfolio Standard Deviation |
|-----------|-------------------------------|------------------------------|
| 1         | 19                            | 8                            |
| 2         | 25                            | 12                           |
| 3         | 16                            | 6                            |
| 4         | 22.5                          | 10                           |

The expected return on the market portfolio is 12% with an accompanying standard deviation of 4% the risk free rate of interest is 5%

Required

- (i) Use Capital market line to identify whether the portfolios are fairly priced. (8 Marks)
- (ii) In case of an efficient portfolio in (i) above, determine what the standard deviation should be for efficiency to be achieved at the given expected return. (3 Marks)

**QUESTION THREE – (20 MARKS)**

- (a) Explain the significance of hedge ratio in the context of option pricing. (2 Marks)
- (b) An investor who has Sh.30,000 to invest believes that the price of stock will increase in the next three months. The current price of the stock is Sh.30. The investor could directly invest in the stock or she would purchase three month call option with a strike price of Sh.35 for Sh.3

Compute

- (i) Profit from investing directly in the stock if the stock price is Shs.45 in three months. (2 Marks)

- (ii) Profit from investing in call options if the price of the stock is Sh.25 in three months. (4 Marks)
- (c) (i) Compute call option price by applying black schools option pricing model on the following values. (8 Marks)
- |                                     |          |
|-------------------------------------|----------|
| Strike price                        | Sh45     |
| Risk free rate (T-Bills)            | 10%      |
| Standard deviation of stock returns | 25%      |
| Time remaining to expiration        | 183 days |
| Current stock price                 | Sh47     |
- (ii) What assumptions did you take for granted in applying the model in (i) above. (4 Marks)

**QUESTION FOUR – (20 MARKS)**

- (a) Explain three tests of weak form of market efficiency. (6 Marks)
- (b) Compare the futures and forward contracts. (6 Marks)
- (c) The Managing Director of Centum Limited a company listed at the Nairobi securities exchange has asked you to assist in estimating the firm’s equity beta coefficient. The firm is all equity financed and was listed at the Nairobi Securities Exchange five years ago. You have gathered the following information from Rich Company website.

| Year | Centum Limited Average Share Price (sh) | Dividend Per Share (DPS) |
|------|---|--------------------------|
| 2008 | 69.5                                    | -                        |
| 2009 | 73.5                                    | 3.5                      |
| 2010 | 81.5                                    | 4.25                     |
| 2011 | 92.5                                    | 4.5                      |
| 2012 | 94.0                                    | 5.0                      |

Nairobi Securities Exchange

| Year | Average Share Index | NSE Dividend Yield | Return on government Stocks (%) |
|------|---------------------|--------------------|---------------------------------|
| 2008 | 2000                | -                  | 6                               |
| 2009 | 2990                | 3                  | 7                               |
| 2010 | 3040                | 5                  | 9                               |
| 2011 | 3280                | 5.5                | 8                               |
| 2012 | 4000                | 5.5                | 8                               |

Required

Use Capital Asset Pricing Model (CAPM) to estimate the beta of Centum. (8 Marks)

**QUESTION FIVE – (20 MARKS)**

You contemplate investing in a portfolio consisting of three security A, B and C. You currently have Ksh1, 200,000 which you want to invest equally in each. The returns of each assets under four state of nature were given as below

| State of nature | Probability | Asset Returns |    |    |
|-----------------|-------------|---------------|----|----|
|                 |             | A             | B  | C  |
| 1               | 0.4         | 0             | -5 | 6  |
| 2               | 0.3         | 4             | 2  | 8  |
| 3               | 0.2         | 12            | 10 | 10 |
| 4               | 0.1         | 16            | 14 | 12 |

Required:

Calculate

- (i) The risk and return of each security (8 Marks)
- (ii) The risk and returns of the portfolio consisting of A, B and C. (12 Marks)