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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2018/2019 ACADEMIC YEAR THREE**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES**

**FOR THE DEGREE OF BACHELOR OF EDUCATION**

**COURSE CODE: ACS 304**

**COURSE TITLE: FINANCIAL MATHEMATICS II**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 06/02/2020 TIME: 2.00-4.00 PM**

**INSTRUCTION TO CANDIDATES**

* **The examination has FIVE (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of THREE (3) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. An investment of $100,000 at an interest rate of 9% compounded quarterly was made 8 years ago. What amount invested 4 years ago at 12% compounded annually would yield the same maturity value **[4 marks]**
2. An individual wishes to invest in a given portfolio where A(0)=100, A(1)=110 dollars. Also S(0)=50 dollars. Suppose that the random variable S(1) can take two values.

$$S\left(1\right)=\left\{\begin{array}{c}52, with a probability p\\\\48, with a probability 1-p\end{array}\right.$$

 Determine,

1. Return on investment. KA **[2 marks]**
2. Return on investment. KS **[4 marks]**
3. Given that the above bond (A) and Stock (S) prices in the value at time (0) of a Portfoliowith X= 20 stock shares and Y= 10 bonds. Determine the total revenue for The investor holding X stock and Y bond. **[4 marks]**
4. An investor holds a debenture of $ 100 carrying a coupon rate of 12% p.a. The interest is payable half yearly on 30th and 31 December every year.the maturity period of the debenture is 6 years and its to be redeemed at a premium of 10%.The investor’s required rate of return is 14% P.a. Compute the value of the debenture. **[6 marks]**
5. Explain three Relationships between the Required Rate of Return and Coupon Interest Rate. **[6 marks]**
6. Elaborate on difficulties with immunization procedure. **[5 marks]**

**QUESTION TWO**

1. A company is proposing to issue a 5 year debenture of ksh. 1,000 redeemable in equal installments at 14 percent rate of interest per annum. If an investor has a minimum required rate of return of 12 per cent, calculate the debenture’s present value for him. What should he be willing to pay now to purchase the debenture? **[10 marks]**
2. Discuss by giving examples three types of security markets. **[6 marks]**
3. An investor is considering the purchase of a 8% Rs. 1,000 bond redeemable after 5 years at par. The investor’s required rate of return is 10%. What should he be willing to pay now to purchase the bond? **[4 marks]**

**QUESTION THREE**

1. Explain the concept of amortization schedule. **[2 marks]**
2. Determine the end of year payment necessary to amortize fully a Ksh.600,000, 10% loan over 4years. Assume payment is to be rendered annually. **[10 marks]**
3. Explain any four types of investment risks. **[8 marks]**

**QUESTION FOUR**

1. Consider two investment schemes A and B. Scheme A offers 12% interest with annual compounding. Scheme B offers 11.5% interest with monthly compounding. Calculate the effective rates of interest of the two investments. Which scheme would you choose giving a reason? **[8 marks]**
2. With well labeled graphs, explain the different types of yield curves. **[12 marks]**

**QUESTION FIVE**

1. Many market analysts and financial advisors divide assets into different categories. With examples discuss five categories assets. **[10 marks]**
2. The table below shows two assets X and Y. An investor invests 60% of his money in asset X and 40% in asset Y.

|  |  |  |  |
| --- | --- | --- | --- |
| state | Pr | Rate of return of X | Rate of return of Y |
| 1 | 0.20 | 0.10 | 0.08 |
| 2 | 0.20 | 0.04 | -0.09 |
| 3 | 0.20 | -0.09 | 0.07 |
| 4 | 0.20 | 0.20 | 0.12 |
| 5 | 0.20 | 0.05 | 0.21 |

For each state of the economies above, calculate the expected rate of return of the portfolio**. [10 marks]**