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OFFICE OF THE DEPUTY PRINCIPAL

ACADEMICS, STUDENT AFFAIRS AND RESEARCH

UNIVERSITY EXAMINATIONS

2020 /2021 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER REGULAR EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE (APPLIED STATISTICS WITH COMPUTING)

COURSE CODE: **STA 428**

COURSE TITLE: **MATHEMATICAL APPLICATIONS IN FINANCE**

DATE: 15/7/2021 **TIME: 0800-1100HRS**

INSTRUCTION TO CANDIDATES

- **SEE INSIDE**

THIS PAPER CONSISTS OF 5 PRINTED PAGES **PLEASE TURN OVER**

REGULAR – MAIN EXAM

STA 428: MATHEMATICAL APPLICATIONS IN FINANCE

STREAM: ASC **DURATION: 3 Hours**

INSTRUCTION TO CANDIDATES

Answer **ALL** questions from section A and any **THREE** from section B.

SECTION A [31 Marks]. Answer ALL questions.

QUESTION ONE (16 MKS)

a) Consider five years projects whose initial investment is Sh 250,000 with an expected salvage value of Sh 50,000. The project is expected to generate the following accounting o kliprofit

Year	1	2	3	4	5
Expected profit Sh '000'	80	70	50	30	20

Determine the accounting rate of return for this project [3 mks]

b) Differentiate between spot price and forward price of a stock [4 mks]

c) Write short notes on:

i) In the money option [3 mks]
ii) At the money option [3 mks]
iii) Out of the money option [3 mks]

QUESTION TWO (15MKS)

a) State the importance of financial analysis [2 mks]

b) List five types of users of financial analysis/statement and explain how they apply in their businesses. [5 mks]

c) Explain three categories of ratios as used in financial analysis [6 mks]

d) Derive an expression of $i^{(p)}$ in terms of i [2 mks]

SECTION B (39 MARKS)

ANSWER ANY THREE QUESTIONS

QUESTION THREE (13MKS)

a) In each group of ratios list two examples and in each explain how they can be interpreted in financial analysis [9 mks]

b) Explain three steps that should be adopted when assessing the financial performance of a business organization [4 mks]

QUESTION FOUR (13MKS)

a) Define the term derivative securities and hence explain the four examples of derivative securities [10 mks]

b) If $\delta(t) = 0.01t + 0.04$ calculate the value to which an investment of amount 1 at time $t = \frac{1}{2}$ will have accumulated by time $t = 6$ [3mks]

QUESTION FIVE (13MKS)

a) Consider a three year project whose initial cash outlay is Sh 120,000 and is expected to generate the following cash flow

Year	**1**	**2**	**3**
Cash flows Sh '000'	**65**	**40**	**50**

If the cost of capital is 12%, compute internal rate of return of this project [6 mks]

b) Consider five year project whose initial cash outlay is Sh 100,000, the project is expected to generate the following cashflows

Year	**1**	**2**	**3**	**4**	**5**
Cash flows Sh '000'	**40**	**30**	**20**	**10**	**5**

If the cost of capital is 12% determine the NPV of the project [7mks]

QUESTION SIX (13MKS)

Discuss the scope of finance functions [13 mks]

QUESTION SEVEN (13 MKS)

a) A company expects to receive Sh 300,000 at the end of each year which could be deposited in an account and earn the interest rate of 12% per annum over a period of 5 years. Compute the future value of the annuity [4mks]

b) Using (a) above, assuming that the annual cashflows are received at the beginning of each year, compute the future value of the annuity [3mks]

c) A company expects to make a payment of 200,000 at the end of each year over a period of 4 years. Using a discounting rate of 16%, compute the present value of all future payments [3mks]

d) Explain three characteristics of capital investments. [3mks]

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