Financial Mathematics (Tutor Worksheet)

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Time: 1 hour **Number of Pages: 2**
March 2025

Instructions

- This sheet is compiled from past material with minor adjustments and mainly for your own practice.
- Your workings are very important and earn part marks in excel assessments.
- Label columns and make sure your work is understandable.
- Aim to learn more than you already know.
- **Note:** The mark allocations in this sheet are not a true reflection of the actual marking standard.

Good luck and do your best! Remember, the goal is to test your own understanding and identify areas that need revision.

Q1 On 7 April 1986, the government issued an index-linked bond that matures in 30 years. Interest is payable half-yearly in arrear and the annual coupon rate is 3%. Both interest and capital payments are indexed by reference to the country's cost of living index with a time lag of eight months.

The index value for August 1985 was 187.52, and at the issue date of the bond the latest known value of the index was 192.10, the value for February 1986.

The issue price of the bond was such that, if the cost of living index were to increase continuously at the rate of 6% per annum effective, a purchaser of the bond would obtain a real yield on his investment of 3% per annum convertible half-yearly.

Calculate the issue price of the bond per R100 nominal.

[**6**]

Q2 Alex has an agreement with Joseph. Joseph is to make regular payments (payable in arrear) over 15 years. And in exchange, Alex gives him R2049 today.

The two agreed on the following details for this annuity:

- The annuity is payable half-yearly for the first five years, quarterly for the next five years and monthly for the final five years.
- The annual amount of the annuity is doubled after each five-year period.
- Moreover, the interest structure over the 15 years is on the basis of: an interest rate of 8% per annum convertible quarterly for the first four years, 8% per annum convertible half-yearly for the next eight years and 8% per annum effective for the final three years. the present value of the annuity is R2049.

Find the initial amount of the annuity.

[**4**]

"Remember, preparation is the key to success! Take your time, read each question carefully, and trust in your knowledge. Good luck!"