Financial Mathematics (Tutor Worksheet)

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Total Marks: 6+6*
Number of Pages: 2

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 (a) As part of project development, Kurt is interested in an annuity (payable for 25 years) to fund a certain project (*"MADO 04"*). The total amount paid in *year t* is t^2. There are six equal payments in a year, spread evenly over each year, payable in advance.

Find the present value of this 25 year annuity using an effective interest rate of 8% per annum.

(4)

(b) Catherine makes a series of strategic payments at the beginning of each year for 20 years, in the hopes of saving for her trip to Japan. The first payment is R100. Each subsequent payment through the tenth year increases by 5% from the previous payment. After the tenth payment, each payment decreases by 5% from the previous payment.

Calculate the present value of these payments at the time the first payment is made using an annual effective rate of 7%. (2)

[**6**]

Q2* BONUS QUESTION

A group called RTFM decided to invest in Student Housing countrywide. At one University the group spent R20 000 000 to build a Residence that houses 800 self-catering students and which it will operate on a build-operate and transfer basis.

The group will receive rental income of R600 000 per annum payable quarterly in advance in the first year. The annual rent (payable in advance in all subsequent years) then will increase by R15 000 per annum thereafter.

The University agreed to buy the building for R50 000 000 at the end of the 25th year.

RTFM is responsible for all repairs during the 25 years. Repairs are paid continuously at the rate of R20 000 per annum in the first year and thereafter the rate of payment increases by R5 000 per annum until the building is sold to the University.

Calculate the present value of the income and expenses of this investment, at an effective interest rate of 6% per annum.

[**6**]

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