Financial Mathematics (Tutor Worksheet)

Created By: K. Mthetho
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Total Marks: 20
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 coffee company 'HuggyMug' is opening a new store in Boston. HuggyMug purchased the premises for $500,000 on 1 January 2025. The total cost of refurbishing the premises will be $1,500,000 which will be incurred in six equal instalments payable monthly in advance with the first payment made on 1 October 2025.

The store is expected to open on 1 May 2026 and is expected to sell cups of coffee each month as follows:

- 10000 cups in the first month (1 May 2026), 11000 in the second month, 12000 in the third month, ...

- until the sixth month (1 Oct 2026) where we sell X cups, then we fix the the number of cups sold to X

- and sell X cups each month thereafter

we sell each cup of coffee at a constant $3 for the whole period.
All income from coffee sales can be assumed to be received continuously during the month.

The costs of staffing and maintaining the new store will be $10,000 per month payable continuously from 1 May 2026 and it is assumed that these will increase on each 1 September by 2% per annum effective.

Finally, assume that all costs and income will cease at the end of 2036.

The effective interest rate is 12% per annum effective.

Now then, calculate the Net Present Value, ie. PV(Income) - PV(Expenses).

[20]

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