Financial Mathematics (Tutor Worksheet)

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Time: 1 hour **Number of Pages: 2**
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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 piece of land in Calgary is available for sale for C$10 000. A candanian company, G-Machino Ltd, believes that there is an opportunity to install electricity-producing solar panels on the land.

The total cost of development will be C$85 000. This cost will be paid monthly in advance in six equal instalments. The first payment will be made at the same time that the land is purchased. Electricity production will start 6 months after the land is purchased.

It is estimated that the development will produce 80 000 units of electricity per year, with production assumed to be uniform across each year.
G-Machino Ltd will sell the produced electricity to the national power supplier, namely ENMAX, at a rate of C$0.12 per unit. Payments for electricity produced will be received quarterly in arrears.

The level of electricity production will fall as the solar panels start to degrade. In fact, the company estimates that the level of electricity produced will fall by 0.5% p.a. Electricity production is assumed to fall annually, with the first decrease of 0.5% occurring 6 months after production begins.

G-Machino Ltd will start monthly maintenance work after 6 months of electricity production. The maintenance costs are expected to be C$1 000 per annum incurred monthly in arrears. Annual maintenance costs will increase by 3% yearly with the first increase taking place a year after the maintenance work starts.

The risk discount rate is 6.5% p.a. effective.

(a) Calculate the accumulated profit of the project after 30 years. (16)

(b) From the above, determine the discounted payback period. (4)

[**20**]

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