# **Interest and Depreciation Questions**

**Question 1**

Amanda has  to invest. She has been offered a flat rate interest of  p.a., with interest added monthly.

(a) If she wishes to earn  interest so that the total amount of money she has comes to  how long will she need to invest her money for? Give your answer correct to the nearest month.

(b) Generate a first-order recurrence relation to find the value of the investment after  years.

(c) Amanda considers leaving the money invested for  years, but wants to see what the balance is at the end of each of the  years. Set up a table that shows the respective values for time,  and .

(d) Represent the account balance for each of the  years graphically.

**Question 2**

Amanda is given a different option for investing her  This option offers an interest rate of  p.a. compounded weekly.

(a) Establish the first-order recurrence relation that gives the value of the investment in relation to the previous year, clearly stating the value of the compounding factor

(b) Compare both investment options that Amanda has (flat rate offer from question **1** and compounding interest offer from question **2**) after two years and then after five years. Comment on your result.

(c) What would you expect from both these investment options in the longer term? Discuss in relation to their respective graphs.

(d) Amanda sets a new target of wanting to reach . Use the Finance Solver on CAS to determine how long it will take if she invests with the compounding interest option. Give your answer in years correct to 2 decimal places.

(e) How does the flat rate option compare if invested for the above specified time found in part (d)?

(f) Given the above information, make a general comment regarding the suitability of both investment options.

**Question 3**

A building company purchased some equipment valued at  The company chose to use the flat rate depreciation model for tax purposes, the rate of which was specified as  It was expected that the useful life of the equipment would be 6 years.

(a) Find the annual depreciation

(b) (i) Write the recurrence relation that represents the depreciation.

(ii) Establish the future value equation that gives the value of the equipment after  years.

(c) Use the equation from (b) (ii) to determine the scrap value.

**Question 4**

Reducing balance depreciation can be expressed by the recurrence relation



(a) State the value of  and calculate its value for the reducing balance rate of .

(b) If an item purchased for  depreciates by  p.a. using the reducing balance method and its scrap value is , how long is its effective life?

**Question 5**

A dishwasher purchased for  depreciates at a rate of  cents per normal wash cycle.

(a) Write down the recurrence relation that represents the depreciation.

(b) Use the recurrence relation to generate a depreciation schedule for the future value of the dishwasher after  and  normal wash cycles.

(c) If after  years the dishwasher was worth  how many normal wash cycles have been run?