Investing and borrowing - Applications test

Name: _____ Date: _____

10 questions | 59 marks | 70 minutes

An original mixed topic paper. Show calculations, label rates and periods, and explain conclusions using the supplied hypothetical financial rules. Round final monetary answers to cents unless a minimum deposit is requested.

A scientific calculator may be used.

1. A school enterprise buys an item for AUD 80 and marks it up 25%. It later discounts the marked price 10%. [5 marks]

(a) Find the marked and final sale prices. [2 marks]

(b) Find profit as a percentage of cost. [3 marks]

2. A club savings account opens at AUD 1000. At each quarter end it earns 1% interest, receives AUD 200 and pays a AUD 5 fee, in that order. [6 marks]

(a) Find the first two closing balances. [3 marks]

(b) Write a recurrence and explain why $1000(1.01)^4$ cannot give its full year-end balance. [3 marks]

3. A single fund earns AUD 540 simple interest from AUD 6000 over 18 months. [6 marks]

(a) Find its annual simple interest rate. [3 marks]

(b) At that rate, how long would AUD 6000 take to reach AUD 6900 under simple interest? [3 marks]

4. A club deposits AUD 4000 at 5% compounded annually. It needs at least AUD 5000. [6 marks]

(a) Compare its balances after 4 and 5 years. [3 marks]

(b) If withdrawals occur only at anniversaries, when is the first withdrawal meeting the target? [3 marks]

5. Equipment costs AUD 6000 now. Its price is modelled to increase 3% each year. A savings deposit earns 5% annually for 3 years. [6 marks]

(a) Find the predicted equipment price after 3 years. [3 marks]

(b) Find the minimum single deposit now that meets that future price. [3 marks]

6. AUD 10000 is invested for 2 years at 6% annually. Under a supplied rule,30% of each year's interest is deducted as tax at year end. [6 marks]

(a) Find the after-tax growth factor per year and final balance. [3 marks]

(b) Compare this with deducting 30% of all accumulated interest only at the end of Year 2. [3 marks]

7. A club buys 100 shares at AUD 7 and another 100 at AUD 9. Each purchase incurs AUD 10 brokerage. It sells all 200 at AUD 9.50, incurs AUD 15 sale brokerage and receives AUD 0.20 per share dividend. [6 marks]

(a) Find total cost and net profit. [3 marks]

(b) Calculate ROI to 2 decimal places and explain why the two purchase prices cannot be ignored. [3 marks]

8. A machine costs AUD 4800 cash. A buyer pays 20% deposit and borrows the rest at 7% flat simple interest for 2 years, with an AUD 80 fee. [6 marks]

(a) Find the deposit, borrowed principal and interest. [3 marks]

(b) Find total outlay including deposit and 24 equal repayments. State the monthly repayment. [3 marks]

9. A student models an AUD 2500 loan at 1% monthly with AUD 300 paid at month end. [6 marks]

(a) Calculate the balance after 3 months. [3 marks]

(b) Give a spreadsheet formula for the next balance if the current balance is in B2 and explain why copying it works. [3 marks]

10. A comparison predicts account A finishes AUD 12 higher than B after one year. A has a fixed rate; B’s rate can change and its quoted rate applies only if a monthly condition is met. [6 marks]

(a) State two pieces of information needed to judge the prediction. [3 marks]

(b) If A has an omitted AUD 18 closing fee, revise the difference and conclusion. [3 marks]