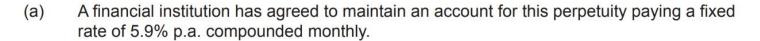**Question 8** **(6 marks)**

Ming, a former high school student and now a successful business owner, wishes to set up a perpetuity of $6000 per year to be paid to a deserving student from her school. The perpetuity is to be paid at the start of the year in one single payment.

(a)   A financial institution has agreed to maintain an account for this perpetuity paying a fixed rate of 5.9% p.a. compounded monthly.

Show that an amount of $98 974, to the nearest dollar, is required to maintain this perpetuity. (3 marks)

(b)   Ming allows herself five years to accumulate the required $98 974 by making regular quarterly payments into an account paying 5.4% p.a. compounded monthly.

Determine the quarterly payment needed to reach the required amount after five years if Ming starts the account with an initial deposit of $1000. (3 marks)