Roche Brothers is considering two alternatives for a capacity expansion of its supermarket – (1) 3-stage expansion, and (2) 1-stage expansion.

The first alternative expands the supermarket at the *end* of year 0 to 60,000 customers, to 70,000 at the *end* of year 3, and to 80,000 at the *end* of year 5. Since the first stage expansion provides a big leap for the company to provide services from 30,000 to 60,000 customers, the initial investment would be higher at the end of year 0 than other two investments. The initial investment would be $1,000,000 at the *end* of year 0, $500,000 at the *end* of year 3, and $200,000 at the *end* of year 5. With this alternative, the company must pay $50,000 of monthly operating expenses.

The second alternative expands the supermarket at the *end* of year 0 to 75,000. The initial investment would be $1,500,000 at the *end* of year 0. With this alternative, the company must pay $30,000 of monthly operating expenses.

The projected demand for the next 7 years is shown below.

|  |  |
| --- | --- |
| Year | Projected Demand |
| 1 | 50,000 |
| 2 | 55,000 |
| 3 | 60,000 |
| 4 | 65,000 |
| 5 | 70,000 |
| 6 | 75,000 |
| 7 | 80,000 |

The current effective capacity is equivalent to 30,000 customers per year and the pre-tax profit is approximately $3 per month of customer spending. Using information given above, please prepare the following information in details:

a. Before-tax cash inflows , cash outflows, and cumulative cash flow through year 7 for each alternative

b. What is the final contribution at the end of year 7 for each alternative?

c. What is the break-even years and months for each alternative?

d. According to the question (c), if the annual compound interest rate is 10%, which alternative is better? Why?