

IE 400: Principles of Engineering Management

Study Set 6

Summer 2021

Question 1. Suppose it costs \$12,000 to purchase a new car. The annual operating cost and resale value of a used car are shown in the table below.

Age of Car (Years)	Resale Value (\$)	Operating Cost (\$)
1	7000	300 (year 1)
2	6000	500 (year 2)
3	4000	800 (year 3)
4	3000	1200 (year 4)
5	2000	1600 (year 5)
6	1000	2200 (year 6)

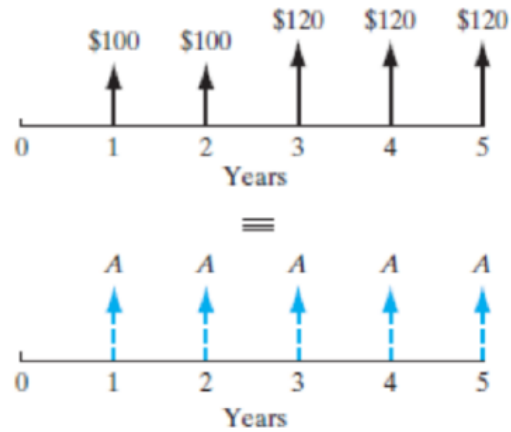
Assuming that one now has a new car, model and solve replacement problem that minimizes the net costs of owning and operating a car for the next six years using shortest path.

Question 2. You are about to borrow \$10,000 from a bank at an interest rate of 9% compounded annually. You are required to make five equal annual repayments in the amount of \$2,571 per year, with the first repayment occurring at the end of year 1. Show the interest payment and principal payment in each year.

Question 3. You bought 300 shares of Microsoft (MSFT) stock at \$2,600 on December 31, 2005. Your intention is to keep the stock until it doubles in value. If you expect 15% annual growth for MSFT stock, how many years do you anticipate holding onto the stock?

Question 4. Henry Cisco is planning to make two deposits: 25; 000 now and 30; 000 at the end of year 6. He wants to withdraw C each year for the first six years and $(C + 1000)$ each year for the next six years. Determine the value of C if the deposits earn 10% interest compounded annually.

Question 5. What value of A makes two annual cash flows equivalent at 13% interest compounded annually?



Question 6. Determine the interest rate (i) that makes the pairs of cash flows shown economically equivalent.

