**IE 260 CLASS EXERCISES - WEEK 13**

1. The package delivery company that you are working for has been getting complaints from the customers lately. The main focus of the complaints is on the late delivery of the parcels. Searching into the problem, you found that the 9-years old truck in the fleet is causing most of the delays. You want to make a detailed replacement analysis and find out when to replace the old truck if it is economical to replace the truck at all. You also see this as an opportunity to start converting your fleet into an electric one.

The 9-years old truck cost 85,000 TL when purchased. However, you see that it can be sold only for 21,000 TL today. You immediately regret that it wasn’t sold last year when there were buyers in the market willing to pay 36,000 TL for the truck. The expected market values and annual expenses for the current truck is given as follows.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| End of Year *k* | 1 | 2 | 3 | 4 |
| MV, End of Year *k* (TL) | 18,000 | 15,000 | 9,000 | 4,000 |
| Annual Expenses, *Ek* (TL) | 8,000 | 5,000 | 6,000 | 9,000 |

Having a governmental incentive, a new electric truck will require an investment of 38,000 TL. The expected market values and annual expenses for the new truck is given as follows.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| End of Year *k* | 1 | 2 | 3 | 4 |
| MV, End of Year *k* (TL) | 27,000 | 18,000 | 12,000 | 9,000 |
| Annual Expenses, *Ek* (TL) | 4,000 | 2,000 | 3,000 | 4,000 |

1. Find the economic lives of the current and the new electric truck with a MARR of 15%.
2. At the end of which year should the current truck be replaced?