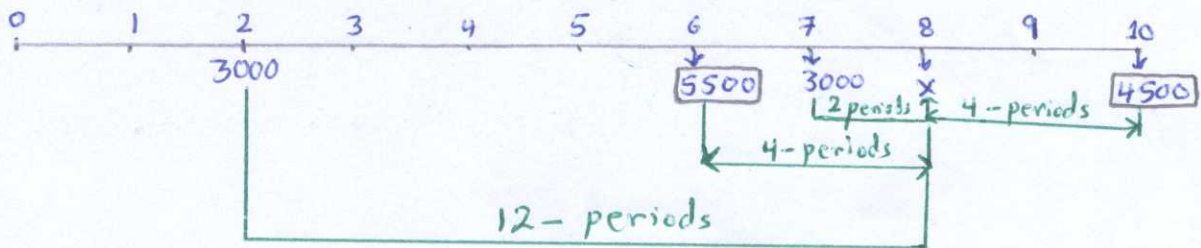


Question 2 : (10 Points)

- a. A debt of \$5500 due in six years from now and \$4500 due in ten years from now is to be repaid by a payment of \$3000 in two years and \$3000 in seven years and final payment at the end of eight years. If the interest rate is 5% compounded semiannually, how much should the final payment? (6 points)

Solution:Let X be the final payment, $r = \frac{.05}{2} = 0.025$ 

$$\textcircled{3} \left\{ \begin{aligned} 3000(1+0.025)^{12} + 3000(1+0.025)^2 + X &= 5500(1+0.025)^4 + 4500(1+0.025)^{-4} \\ 4034.67 + 3151.875 + X &= 6070.971 + 4076.78 \\ X &= 5500(1.025)^4 + 4500(1.025)^{-4} - 3000(1.025)^{12} - 3000(1.025)^2 \\ &= 10,147.75 - 7186.545 \\ X &= \$ 2,961.21 \end{aligned} \right. \textcircled{1}$$

- b. An initial investment of \$25,000 in a business guarantees the following cash flows.

Year	Cash Flow
3	\$8,000
4	\$10,000
6	\$11,000

If the interest rate is 4% compounded semiannually, determine whether the investment is profitable or not? Why? (4 points)

Solution: $r = \frac{.04}{2} = 0.02$

$$\textcircled{2} \left\{ \begin{aligned} \text{The net present value} = NPV &= 8000(1.02)^{-6} + 10,000(1.02)^{-8} + 11,000(1.02)^{-12} - 25,000 \\ &= 7103.771 + 8534.904 + 8673.425 - 25,000 \\ &= 24,312.1 - 25,000 \\ &= -687.9 < 0 \end{aligned} \right. \textcircled{1}$$

The $NPV < 0$, then it is not profitable } $\textcircled{1}$