Question 1 (21 points) A company recently issued 10 year bonds at a price of $1000. These bonds pay $40 interest every 6 months. Their price remained stable since they were issued, and they still trade at par value of $1000.

Due to additional financing needs, the company wants to issue new bonds with a maturity of 5 years, a par value of $1000 and that pay $80 coupons every 6 months. If the investors require the same annual rate of return as they require from the existing bonds, what would be the value of the new bonds?
Question 2 (25 points) A portfolio manager has a $300,000 portfolio with a required return of 7%. Assume that the required return on the market portfolio is $r_M = 6\%$ and the risk-free rate is $r_{RF} = 1\%$.

The manager wants to invest some additional funds in some new stock with a beta 3, so that the new portfolio will have a required rate of return of 11\%. What is the dollar amount that the manager should invest in the new stock with $\beta = 3$ so that the new portfolio will have a required rate of return of 11\%?
**Question 3 (15 points):** Complete the duration of a 3 year bond which pays 80 coupons once every year and pays the 1000 face value at the maturity date when the annual yield $r_{\text{annual}} = 16\%$. 
True or False Questions (3 points each)

For the next 5 True False Questions below, consider a 15 year bond with annual coupon rate of 18% and coupons are paid semiannually. Assume that \( r_{d \text{ annual}} = 10\% \).

- The current value of this bond will be less than the par value of $1000

- If the \( r_{d \text{ annual}} \) remains at 10% after 6 months, the value of this bond will also remain the same.

- If the \( r_{d \text{ annual}} \) remains at 10% after 6 months, the 6 month total return on this bond will be given by 5%.

- If the \( r_{d \text{ annual}} \) remains at 10% after 6 months, the 6 month coupon return on this bond will be higher than 5%

- The duration of this bond will be shorter than the duration of a 15 year bond with 10% annual coupon rate.
For the next 5 True False questions below, consider a 10 year bond with annual coupon rate of 8% and coupons are paid semiannually. Assume that \( r_d \) annual = 10%.

- The current value of this bond will be less than the par value of $1000

- If the \( r_d \) annual remains at 10% after 6 months, the value of this bond will DECREASE

- If the \( r_d \) annual remains at 10% during the next 24 months, the 6 month coupon return on this bond will remain below 5% and decrease over the course of the next 24 months.

- The duration of this bond will be shorter than the duration of a 5 year bond with 8% annual coupon rate.

- If the \( r_d \) annual remains at 10% after 6 months, the 6 month total return on this bond will be 4%
For the next 3 True False questions below, consider

(i) Bond A: 10 year bond with annual coupon rate of 8%
(ii) Bond B: 10 year bond with annual coupon rate of 10%
(iii) Bond C: 20 year bond with annual coupon rate of 8%

- Bond A has the shortest duration.

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- Bond C has the longest duration.

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- An investor whose holds Bond A and Bond B (and nothing else) in equal weights in a bond portfolio will have a bond portfolio duration more than 10 years.

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