Question 1:

You are a risk manager at Depo Bank, a Swiss bank. Victor, a wealth manager, needs your help to prepare a meeting with Mrs Jasper, the widow of one of his Swiss clients who passed away recently.

He explains that Mrs Jasper would like to understand the investments that her husband has made. She does not have a deep knowledge about investments and asked him several questions. Unfortunately, he cannot answer himself because he has a very busy day and the meeting with this client is planned for tomorrow.

You check the client's portfolio at the end of March 2022 and decide to help Victor by answering Mrs. Jasper's questions. Delighted with your response, Victor tells you that you may ignore taxes in the calculations for simplicity.

a) A major portion of the portfolio is invested in bonds and the largest portion of bonds is the EUR 300,000 (nominal) that was invested on 19th July 2019 in 10-year bonds issued by NIBC Bank maturing on 19th July 2027 that carry an annual coupon of 0.46%. The bond currently quotes at 99.56% (clean price).

a1) What are the expected cash flows from the bond from now on? (4 points)

a2) What is the current yield on the bond? (4 points)

a3) If the yield to maturity of the bond is 0.58% and yields increase by 0.10% (0.1 percentage point) on 19th July 2022, what is the expected change in the bond position in percentage terms if you use duration to estimate the change? [Hint: First calculate the price in EUR of the bond on 19th July 2022. Then, calculate the Macaulay duration which you can use to estimate the percentage price change.]
[Note: If you didn't answer a1), use a coupon amount of EUR 1,300 and a final repayment of EUR 250,000.] (9 points)

b) As the bonds position matures in EUR, there are corresponding futures contracts to hedge the EUR position with respect to CHF. The client has rolled over the 2-year futures contracts and the current contracts which will expire in June 2023, trade at EUR 1 = CHF 1.0425 while the spot rate is EUR 1 = CHF 1.04. The contract size of a EUR/CHF futures contract is EUR 100,000.

b1) The EUR/CHF contract size is EUR 100,000 on the EUREX exchange and is EUR 125,000 on the CME group exchange. Which exchange will you choose for the roll over of the contract? What is the futures position needed to hedge EUR 300,000 exposure? (3 points) b2) Explain what the expected cash flows from the futures position are? Just describe. No calculations or numbers needed. (4 points)

b3) If you have to hedge using options, how would you do that? Just describe. No calculations or numbers needed. (2 points)

c) Equities form 30% of the portfolio and one of the largest holdings is 8,000 shares of Nestle Ltd quoting at CHF 130 per share. The company has just declared EPS (earnings per share) of CHF 5 and a dividend of CHF 3 per share.

c1) What are the expected cash flows from the Nestle shares? [Hint: taxes not considered] (2 points)

c2) What is the dividend yield of Nestle shares? (2 points)

c3) What corporate action can a company take that has a similar objective to dividends? How is it different from paying dividends? (2 points)

c4) Briefly explain how would you classify the stock of Nestle using the 3 main classification criteria? (6 points)

d) The portfolio also has open short positions in Nestle call options with a strike price of CHF 140 maturing in 3 months. The current stock price is CHF 130, and the contract size is 100.

d1) What are the expected cash flows of a short position in call options? Among others, also name the expected cash flows of the Nestle call options short position per contract if it is exercised. (4 points)

d2) What type of option is it if the strike is higher than the stock price (how is it called)? (2 points)

d3) What is the maximum number of option contracts that can be sold against the 8,000 shares of Nestle? (2 points)

d4) Explain the reasoning behind the short call position? What is the risk with this strategy? (2 points)