Program	**MSc Quantitative Finance**
Course	**Financial Markets and Instruments**
Subject	**Mini Test 3**

Name:______________________________ Student Number:______________________

In July 2021, a European insurance company entered a long position in a USD/EUR 9M forward contract at a forward price of 1.0932 USD/EUR with a notional principal of 150 million EUR. Three months later the CEO asks to provide accounting numbers (= replication value) and the selling value (= closing value) for this position.

- Provide the cash flows and maturities of the FX forward contract.
- Provide the cash flows and maturities that exactly replicate the contract and calculate the replication value.
- Provide the cash flows and maturities that exactly close the contract and calculate the closing value.
- The CEO asks you how these numbers would change and why, if EUR interest rates increase.

EURD	**Bid**	**Ask**	**USDD**	**Bid**	**Ask**	**Days**
ON	0.20	0.23	**ON**	1.56	1.61	1
TN	0.21	0.24	**TN**	1.61	1.66	1
SW	0.32	0.37	**SW**	1.66	1.71	7
1M	0.41	0.45	**1M**	1.71	1.76	31
3M	0.45	0.52	**3M**	1.76	1.84	91
6M	~~0.50~~	0.54	**6M**	1.85	1.91	182
9M	0.64	0.68	**9M**	1.97	2.01	275
1Y	0.75	0.81	**1Y**	2.03	2.07	365
EUR=	1.1189	1.1209				

продав 1 евро 1,1189 USD получим
купить 1 евро, 1,1209 USD надо

July (0) October (3) April (9M)

Long position in FX

+150 M[EUR]
− 1,0932 · 150 =
(163,98[USD])

Replicate

150 M[EUR] −
− 163,98[USD]

Long MM 6M EUR $\quad -150/(1+0,5\% \cdot \frac{182}{360}) = -149,62$ [EUR] $\quad$ 150M

Buy EUR $\quad +149,62$ [EUR]

$- 1,1209 \cdot 149,62 =$

$= -167,71$ [USD]

$-163,98$ [USD]

Short MM 6M USD $\quad \dfrac{163,98}{(1+1,91\% \cdot \frac{182}{360})} =$

$=$

$= 162,11$ [USD]

$-167,71 + 162,11 = -5,59$

$RV = -5,59$

Close

$-150M$ [EUR] $+$

$+163,98$ [USD]

Short MM 6M EUR $\quad 150/(1+0,54\% \cdot \frac{182}{360})$

$= 149,59$ [EUR]

Sell EURO $\quad -149,59$ [EUR]

$+ 1,1189 \cdot 149,59$

$= 167,37$ [USD]

Long USD $\quad -163,98/((1,89\% \cdot \frac{182}{360}+1)$ $\quad +163,98$ [USD]

$-162,48$

$$CV = -(167,37 - 162,48) =$$

$$= -4,94$$

(т.е. нужно доплатить, чтобы выйти из сделки)