7.09 The Term Structure of Interest Rates Spot, Par, and Forward Curves

Question 1

An investor with a 5-year investment horizon observes the following annual compound spot rates:

Tenor	Spot Rate
1-year	2.50%
2-year	2.90%
3-year	3.20%
4-year	3.40%
5-year	3.50%

Given the observed spot rates, the 3y2y implied forward rate is *closest* to:

A. 3.55%

B. 3.90%

C. 3.95%

Question 2

The forward curve consists of the following rates, which are stated on a semiannual basis:

Time Period	Forward Rate
0y1y	5.00%
1y1y	7.20%
2y1y	11.00%
3y1y	12.25%

Based on this information, the implied three-year spot rate is *closest* to:

A. 7.56%

B. 7.72%

C. 9.78%

Question 3

An analyst gathers the following information on spot rates:

Maturity	Spot Rate
0.5 year	1.50%
1.0 year	1.90%
1.5 years	2.20%
2.0 years	2.40%

Based on this information, the price of a two-year 3% coupon bond that pays interest semiannually is *closest* to:
A. 96.64
B. 101.16
C. 101.18

Question 4
An analyst has compiled the following data points from a forward curve:

Period	Forward Rate (%)
0y1y	0.90
1y1y	1.35
2y1y	2.89
3y1y	3.42

Based on these rates, the price of a 3-year bond with 2.5% annual coupon is *closest* to:
A. 102.34
B. 104.01
C. 104.57

Question 5
A feature of spot curves is that bond yields-to-maturity *most likely* assume that bonds are:
A. priced at par.
B. coupon bonds.
C. free of default risk.

Question 6
A benchmark government yield curve is *most likely* obtained from:
A. interpolation.
B. the par curve.
C. the spot curve.

Question 7
An investor wants to price a two-year, 6% annual coupon bond. Spot rates are 5% for zero-coupon, one-year bonds of similar credit quality and 7% for similar, zero-coupon, two-year bonds. Based on this information, the price of the bond per 100 of par value is *closest* to:
A. 98.19
B. 98.30
C. 101.86

Question 8
An investor is considering a three-year investment and has calculated a "2y1y" forward rate of 2.75%. If a two-year zero-coupon bond's YTM is 1.85% and a three-year zero-coupon bond's YTM is 2.15%, the forward rate is *best* described as the:
A. implied spot rate of a two-year zero-coupon bond in one year.
B. required rate of return to invest in the three-year zero-coupon bond.
C. breakeven reinvestment rate on a one-year zero-coupon bond in two years.

Question 9
.Theoretically, all bonds on a par curve are *least likely* to have the same:
A. liquidity.
B. maturity.
C. credit risk.

Question 10
Which of the following is *most likely* a valid assumption in constructing a par yield curve?
A. A par yield curve mainly uses bonds that are priced at par.
B. All cash flows from a bond are discounted at the same rate.
C. Each bond uses the same periodicity regardless of maturity.

Question 11
An analyst has gathered the following forward rates:

Period	Forward Rate
0y,1y	2.23%
1y,1y	2.49%
2y,1y	2.61%

If the rates are based on a periodicity of one, the implied two-year spot rate is *closest* to:
A. 2.36%
B. 2.44%
C. 2.75%

Question 12

A Treasury bond with a 5% annual coupon and 4 years remaining to maturity is currently priced at 106 per 100 of par value. An investor plans to create an arbitrage profit by replicating this bond with zero-coupon strips using the spot rates shown in the image below:

Time to Maturity (years)	Spot Rates
1	0.4%
2	1.2%
3	2.1%
4	3.4%

Ignoring transaction costs, the potential profit from the arbitrage transaction is *closest* to:

A. 0

B. 0.31

C. 0.42

Question 13

An investor replicates a 4-year, 2% annual coupon-paying Treasury bond with 100 par value by combining zero-coupon bonds with the following spot rates:

Time to Maturity (years)	Spot Rates (annual)
1	0.5%
2	1.7%
3	2.8%
4	4.0%

The YTM on the bond is *closest* to:

A. 3.00%

B. 3.94%

C. 4.43%

Question 14

The following table shows the spot rates for Years 1 through 4:

Year	Spot Rate
1	3.25%
2	3.75%
3	4.15%
4	4.35%

If the rates are stated on an annual basis, the 2y1y implied forward rate is *closest* to:

A. 4.25%
B. 4.60%
C. 4.95%

Question 15
The following table shows a series of annual spot rates:

Maturity (years)	Spot Rate (%)
1	1.05
2	2.33
3	2.90

The 1-year rate available in 2 years is *closest* to:
A. 3.47%
B. 4.05%
C. 6.04%

Question 16
The forward curve is constructed from the implied forward rates shown below. The rates are stated on an annual basis:

Time Period	Forward Rate
0y1y	1.20%
1y1y	2.15%
2y1y	2.85%
3y1y	3.25%

The price per 100 par value of a three-year, 4% annual-pay bond is *closest* to:
A. 102.11
B. 103.38
C. 105.64

Question 17
The risk-free yields for a spot curve constructed from government debt instruments *most likely* refer to the absence of:
A. credit risk.
B. liquidity risk.
C. inflation risk.

Question 18
An analyst has gathered the following information on zero-coupon government bond yields:

Maturity	Spot Rate
1 year	2.42%
2 years	3.05%
3 years	3.48%
4 years	3.65%

If the rates are based on a periodicity of 1, the one-year forward rate 2 years in the future (2y1y) is *closest* to:

A. 3.72%

B. 4.16%

C. 4.35%