

FIN101 Fixed Income I Questions – Set I Part A
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Question 1: I) Step Up Notes have coupon payments that decrease with time.
II) Treasury Inflation Protection Securities (TIPS) issued by the US Treasury have a principal that increases at the rate of inflation and a coupon rate that stays constant.
I&II are: A) FT B) FF C) TT D) TF

Question 2: I) A Deferred Coupon bond may not pay coupons for the first few periods.
II) The majority of Treasury bonds have coupon payments that increase as interest rates increase.
I&II are: A) FT B) FF C) TT D) TF

Question 3: A corporation has issued bonds with a “Sinking Fund” provision, which requires the corporation every year after the first ten years to 1) either give the Trustee either \$10 million for the Trustee to repurchase some of the issue 2) or to repurchase bonds of face value \$10 million and deliver them to the Trustee.
I) Suppose the coupon rate on the bonds is 4%, and currently the bonds yield 3.5%. In this situation the corporation will prefer to pay the Trustee.
II) Suppose the coupon rate on the bonds is 4%, and currently the bonds yield 6%. The corporation will prefer to buy bonds of face value \$10 million in the market and deliver these purchased bonds to the Trustee.
I&II are: A) FT B) FF C) TT D) TF

Question 4: I) The dirty price for a bond is the price that is quoted (does not include accrued interest).
II) The dirty price for a bond is the price that is actually paid (settlement price).
I&II are: A) FT B) FF C) TT D) TF

Question 5: I) The clean price for a bond will be show less volatility compared to the dirty price during the time coupon payments are made.
II) he clean price and dirty price will be equal immediately after the coupon payment.
I&II are: A) FT B) FF C) TT D) TF

Question 6: I) The Term Structure of Interest Rates is a plot of yields of Treasury bonds of varying coupon rates.
II) The 10 year spot rate equals the yield on a 10 year Treasury bond with 10 years left to maturity.
I&II are: A) FT B) FF C) TT D) TF

Information for Questions 7 to 10: A bond with face value \$1,000 and 4 years to maturity has 5% yearly coupons. The one year, two year, and three year Treasury spot rates are: 4%, 4.25%, and 4.75%.

Question 7: The present value of the coupon paid at the end of the first year is:

- A) \$46.08
- B) \$47.08
- C) \$48.08
- D) \$49.08

Question 8: The present value of the coupon paid at the end of the second year is:

- A) \$46.01
- B) \$47.01
- C) \$48.01
- D) \$49.01

Question 9: The present value of the coupon paid at the end of the third year is:

- A) \$46.50
- B) \$45.50
- C) \$44.50
- D) \$43.50

Question 10: Now suppose the price of the bond (present value) today is \$1,030. What is the 4 year spot rate?

- A) 4.15%
- B) 4.25%
- C) 4.35%
- D) 4.45%

Question 11: The spot rates for years 1, 2, and 3 are 5.31%, 5.54% and 5.77% respectively. What is the YTM for a 3 year bond that pays yearly coupons of 5%?

- A) 5.4548%
- B) 5.5548%
- C) 5.6548%
- D) 5.7548%

Question 12: The price of a 5 year maturity Zero of face value \$1 is \$0.80. The price of a 6 year maturity Zero of face value \$1 is \$0.75. The Forward Rate from the 5th to the 6th year is:

- A) 4%
- B) 5%
- C) 6.667%
- D) 25%

Question 13: The yield of a 7 year maturity Zero is 5.47%. The yield of a 9 year maturity Zero is 5.52%. The Forward Rate from the 7th to the 8th year is 5.49%. What is the Forward Rate from the 8th to the 9th year:

- A) 5.3%
- B) 5.5%
- C) 5.7%

D) 5.9%

Information for Questions 14 to 15: The rate for investing for 1 year today is 5.1%.

The forward rates for investing for 1 year are:

1 year from now: 5.2%

2 years from now: 5.29%

Question 14: The spot rate for two years is:

A) 0.04949988

B) 0.05049988

C) 0.05149988

D) 0.05249988

Question 15: The spot rate for 3 years is:

A) 0.0489664

B) 0.0499664

C) 0.0509664

D) 0.0519664

Question 16: The prices of a two year and a three year Zeros (maturity values of \$1) is \$0.897 and \$0.844. According to the Pure (Unbiased) Expectations Theory, the market's expectation of the one year yield two years from now is:

A) 6.1796%

B) 6.2796%

C) 6.3796%

D) 6.4796%

Question 17: I) According to the Expectations Theory an upward (downward) sloping Yield Curve implies that the market expects interest rates to rise (fall).

II) In the Expectations Hypothesis risk plays a role in determining rates.

I&II are: A) FT B) FF C) TT D) TF

Question 18: Suppose the price of face value \$1 one-year Zero is \$0.9562 and two-year Zero is \$0.9189. The is the Expectations Theory is true, the expectation of the one-year rate one year from now is:

A) 4.5806

B) 4.0592

C) 4.3196

D) Insufficient Information

Question 19: I) If real interest rates are stable (consistent with Irving Fisher's idea), and the expectations hypothesis is true then an upward sloping yield curve implies that the market expects the inflation to fall.

II) Suppose the expectations hypothesis is true and the one year yield is less than the two year yield. Then the market expects the one year spot rate a year from now to be greater than the current spot rate.

I&II are: A) FT B) FF C) TT D) TF

Question 20: I) If the Liquidity Preference (Biased Expectations) theory is true, then it is possible to have an upward sloping yield curve along with the market expecting interest rates to fall.

II) If the Liquidity Preference (Biased Expectations) theory is true, then it is possible to have a downward sloping yield curve along with the market expecting interest rates to rise.

I&II are: A) FT B) FF C) TT D) TF

Question 21: I) In the Liquidity Preference (Biased Expectations) theory with real rates and inflation remaining constant through time, a one-year yield may be lower than the two-year yield because of the higher interest rate risk borne by two-year bonds.

II) The risk-premium for interest rate risk in the Liquidity Preference (Biased Expectations) is necessarily positive.

I&II are: A) FT B) FF C) TT D) TF

Question 22: I) In the Market Segmentation Theory the interest rate in each segment is determined by demand and supply within that segment.

II) In the Preferred Habitat Theory investors remain in their market segment (preferred habitat) irrespective of the difference in interest rates between segments.

I&II are: A) FT B) FF C) TT D) TF

Question 23: Suppose the yield of a 6% 2 year (semi-annual coupons) AAA bond is 6.5% and the yield of the 6% 2 year (semi-annual coupons) Treasury is 5% then Relative Yield Spread is:

- A) 1.5%**
- B) 5%**
- C) 15%**
- D) 30%**

Question 24: Suppose the yield of a 6% 2 year (semi-annual coupons) AAA bond is 6.5% and the yield of the 6% 2 year (semi-annual coupons) Treasury is 5% then Yield Ratio is:

- A) 1.5%**
- B) 6.5%**
- C) 130%**
- D) 0%**

Question 25: Suppose the spot rates (annualized) for Treasuries are given as:

6 months	= 1.31%	(1/2 of annualized 6 month spot rate)
1 year	= 1.92%	(1/2 of annualized 1 year spot rate)
1.5 years	= 2.37%	(1/2 of annualized 1.5 year spot rate)
2 years	= 2.96%	(1/2 of annualized 2 year spot rate)

The Z-spread (annualized) is 1.24% for a 2 year maturity, 4% coupon (paid semi-annually) bond with face value of \$1,000. Remember, these rates are calculated using 6-month periods. The price of the bond is:

- A) \$1,001.86
- B) \$1,011.86
- C) \$1,021.86
- D) \$1,031.86

Question 26: I) Yield Spreads between assets in the same sector are called inter-market yield spreads.

II) The extra yield of Corporates over comparable (same coupons and face) Treasuries is called the Credit Spread.

I&II are: A) FT B) FF C) TT D) TF

Question 27: I) Credit Spreads contract during recessions (expansions).

II) Bonds with Embedded Options (like call provision) that favor the issuer result in higher bond prices.

I&II are: A) FT B) FF C) TT D) TF

Question 28: I) Bonds that are less liquid have lower prices and hence higher spreads.

II) Larger issues are more liquid.

I&II are: A) FT B) FF C) TT D) TF

Answers (Starred questions are discussed below):

- 1) A 15) D
- 2) D 16) B
- 3) C 17) D
- 4) A 18) B
- 5) C 19) A
- 6) B* 20) D
- 7) C 21) C
- 8) A 22) D
- 9) D 23) D
- 10) A 24) C
- 11) D* 25) A*
- 12) C* 26) A
- 13) D* 27) B
- 14) C 28) C

Discussion for Question 6: The yield on a 10 year treasury is a mix of the 10 year spot rate and spot rates for lower maturities.

Discussion for Question 11: First find price of bond by adding present values of coupons and face (paid on maturity). Then find YTM.

Discussion for Question 12: The Forward Rate is the rate of return that we can “lock in” today for an investment that we will make from the 5th to the 6th year (one-year investment). An alternative way to do this is to sell a 5 year Zero today to receive \$0.94. Use this money to buy $\$0.80/\$0.75 = 1.06667$ units of the 6 year Zero. Cash flow today = 0; Cash flow 5 years from now = -\$1 (as short the 5 year Zero); Cash flow 6 years from now = \$1.06667. Hence return = 6.667%. As “alternative way” has the same results as entering into a Forward, therefore by Absence of Arbitrage the Forward Rate must be 6.667%

Discussion for Question 13: The price of a 7 year maturity Zero is $\$1/1.0547^7 = \0.688807 , and of a 9 year maturity Zero is $\$1/1.0552^9 = \0.616576 . Hence the return that can be obtained from the 7th to the 9th year by trading Zeros is $\$0.688807/\$0.616576 - 1 = 11.7147\%$. And the return from the 8th to the 9th years that can be guaranteed TODAY by trading Zeros and entering into a Forward Contract from the 7th to the 8th years is: $1.117147/1.0549 - 1 = 5.9008\%$.

Discussion for Question 25: You have to divide the Z-spread by 2 (to get the 6-month rate) and then add it to the spot rates.