

**Birla Institute of Technology & Science, Pilani.**

**Hyderabad Campus, First Term 2022-23**

**Course No. ECON F412/FIN F313**

**Course Title: Security Analysis & Portfolio Management**

**Quiz-3 (CB)**

**Marks: 20 (10%) 40 mins.**

**Date: 09/12/2022**

**Name of the Student:**

**ID No.:**

Each question carries 2 marks. There is no negative marking. Please write the correct options in the box below. Please ensure you have written your name and id number.

QUESTIONS	OPTION SELECTED
Q1	
Q2	
Q3	
Q4	
Q5	
Q6	
Q7	
Q8	
Q9	
Q10	

### Data for Q1-Q3

As a general rule, a PEG ratio of 1.0 or lower suggests a stock is fairly priced or undervalued respectively. A PEG ratio above 1.0 suggests a stock is overvalued. PE ratio below 30 might be considered as underpriced, and greater than equal to 30 as overpriced.

Name of Company	Market value of equity (INR crores)	Net Profit (INR crores)	Dividend pay-out ratio (%)	Shareholder's equity (INR crores)
Techno Ltd. (TL)	5000	130	30%	700
Lesla Ltd. (LL)	1500	40	60%	60
UniverseX Ltd. (UL)	10000	400	25%	500
Kpharma Ltd. (KL)	500	15	25%	25
Risco Ltd. (RL)	7600	200	40%	55

The growth rate in earnings is the product of the retention ratio and return on equity.

#### **Q1. Which statements are correct?**

- I. **KL** is underpriced based on the PEG ratio
- II. All 5 stocks are overpriced as per the PE ratio

- a) Only I is correct
- b) Only II is correct
- c) Both I and II are correct
- d) Neither I nor II is correct

#### **Q2. Which statements are correct?**

- I. PEG ratio of **TL** is less than 2
- II. PEG ratio of **RL** is more than 0.5

- a) Only I is correct
- b) Only II is correct
- c) Both I and II are correct
- d) Neither I nor II is correct

#### **Q3. Which statements are correct?**

- I. ROE for **UL** is 50%
- II. The growth rate in earnings for **TL** is in the range of 12%-14%

- a) Only I is correct
- b) Only II is correct
- c) Both I and II are correct
- d) Neither I nor II is correct

#### **Data for Q4-Q6**

You are hired as a fixed-income portfolio manager. You have information about a corporate bond issued recently in the market. This is a green bond issued to fund projects with positive environmental benefits. The bond is an AAA-rated bond. The par value of the bonds is ₹1000. The characteristics of the bonds are provided below: -

You also have information on a Social bond.

Bond	Time to maturity	Coupon rate p.a.	Payments
Social Bond (S)	6 years	6%	Annual
Green bond (G)	4 years	8%	Annual

The market interest rate (yield to maturity) is 8% p.a. for **Green bonds** and 6%p.a. for Social bonds at the time of issuance.

**Q4. What is the % change in price for 150 basis points increase in market interest rate using duration and convexity adjustment together for Green bond?**

- a) -ve 6% to -ve 3%
- b) 4%-5%
- c) -ve 2.5% to -ve 1.5%
- d) 6%-8%
- e) None of the options are correct

**Q5. Which statements are correct?**

- I. The interest rate risk of Green bond is higher than Social bond
  - II. *Ceteris paribus*, higher the coupon rate, higher is the interest rate risk
- a) Only I is correct
  - b) Only II is correct
  - c) Both I and II are correct
  - d) Neither I nor II is correct

**Q6. Which statements are correct?**

- I. The annual convexity of Green bond is higher than Social bond
  - II. The Macaulay duration in years of Green bond is lower than Social bond
- a) Only I is correct
  - b) Only II is correct
  - c) Both I and II are correct
  - d) Neither I nor II is correct

**Q7. Which statement is wrong?**

- a) Reinvestment risk is the risk that a bond is repaid early, and an investor has to find a new place to invest with the risk of lower returns.
- b) Resistance is a high price range in which selling activity is sufficient to stop a price rise.
- c) The golden cross appears on a technical chart when a stock's short-term moving average crosses above its long-term moving average, indicating the potential for a bullish price movement.
- d) White/Hollow candle stick chart indicates bearish pressure

**Data for Q8-Q9**

An insurance company wishes to shield its overall financial obligation from exposure to interest rate fluctuations. They wanted to fund the obligation using 3-year zero coupon bond and a perpetual bond paying fixed annual coupons (ytm being 7% p.a.). The insurance company has an expected obligation of \$24000 in 6 years.

**Q8. What should the proportion invested in perpetual bonds be for immunization (range)?**

- a) 73%-76%
- b) 0%
- c) 23%-25%
- d) 100%
- e) None of the options are correct

**Q9. After 1 year, the market interest rate for perpetual bond reduces by 100 basis points. What should the proportion invested in perpetual bonds be for immunization after 1 year has passed (range)? (Note there will be reallocation as years remaining for expected obligation is 5 years now and time to maturity remaining for zero coupon bond will be 2 years.)**

- a) 79%-80%
- b) 18% - 22%
- c) 25%-28%
- d) 100%
- e) None of the options are correct

**Q10. The parameter which demonstrates how the duration of a bond changes as the interest rate changes and measures the curvature in the relationship between bond prices and bond yields is**

- a) Macaulay duration
- b) Modified duration
- c) Convexity
- d) Par value of bond
- e) None of the options are correct

## FORMULA LIST

$$\text{Convexity} = \frac{1}{P \times (1+y)^2} \sum_{t=1}^T \left[ \frac{CF_t}{(1+y)^t} (t^2 + t) \right]$$

**P** = Bond price.

**y** = Yield to maturity in decimal form.

**T** = Maturity in years.

**CF<sub>t</sub>** = Cash flow at time t.

Macaulay Duration

$$D = \frac{\sum_{t=1}^n \frac{C_t \times t}{(1+r)^t}}{\sum_{t=1}^n \frac{C_t}{(1+r)^t}}$$

$r \rightarrow$  ytm of bond

$t \rightarrow$  time of coupon or principal repayment

$C_t \rightarrow$  Coupon & Principal repayment.