BOND VALUATION

IMPORTANT QUESTIONS

CLASS WORK QUESTIONS

Question 7:

On 31st March, 2023, the following information about Bonds is available:

Name of Security	Face Value ₹	Maturity Date	Coupon Rate	Coupon Date(s)
Zero coupon	1,000	31st March, 2033	N.A.	N.A.
T-Bill	10,000	20th June, 2023	N.A.	N.A.
10.82% GOI 2033	1,000	31st March, 2033	10.82	31st March
12 % GOI 2028	1,000	31st March, 2028	10.00	31st March & 30th September

Calculate:

i. If 10 years yield is 8.5% p.a. what price the Zero Coupon Bond would fetch on 31st March, 2023?
ii. What will be the annualized yield if the T-Bill is traded @ 9820?
iii. If 10.82% GOI 2033 Bond having yield to maturity is 8.5%, what price would it fetch on April 1, 2023 (after coupon payment on 31st March)?
iv. If 12% GOI 2028 Bond having yield to maturity is 10%, what price would it fetch on April 1, 2023 (after coupon payment on 31st March)?

(Source: FOD)

Question 12:

On 1 June 2003 the financial manager of Gadgets Corporation's Pension Fund Trust is reviewing strategy regarding the fund. Over 60% of the fund is invested in fixed rate long-term bonds. Interest rates are expected to be quite volatile for the next few years.

Among the pension fund's current investments are two AAA rated bonds:

a. Zero coupon June 2018
b. 12% Gilt June 2018 (interest is payable semi-annually)

The current annual redemption yield (yield to maturity) on both bonds is 6%. The semi-annual yield may be assumed to be 3%. Both bonds have a par value and redemption value of $100.

Required:

Estimate the market price of each of the bonds if interest rates (yields):

i. increase by 1%;
ii. decrease by 1%.

[Given PVF (2.5%, 30) = 0.4767, PVF (3%, 30) = 0.412, PVF (3.5%,30) = 0.3563]

(Source: ICAI)

Question 15:

On 30th January2022 Bank of Baroda proposes to borrow a certain sum of money from CB Bank for a period of 12 days @ 14% p.a. against 16.5% GOI Securities having a face value of Rs. 800 crore currently trading at Rs. 830 crore maturing on 30th April 2022. The coupon dates are 30 April and 30 September. You are required to determine the amount of borrowing and buy-back price of securities.

(Source: FOD)

Question 17:

Amara Raja Batteries Ltd. plans to issue Commercial Paper (CP) of ₹ 1,00,000 at a price of ₹ 97,800.

Maturity Period: 5 Months

Expenses for issue of CP are :

i. Brokerage 0.10%
ii. Rating Charges 0.60% and
iii. Stamp Duty 0.15%

Find the effective interest rate per annum and the cost of Fund.

(Source: FOD)

Question 29:

i. Consider two bonds, one with 10 years to maturity and the other with 25 years to maturity. Both the bonds have a face value of ₹ 1,000 and coupon rate of 10% (with annual interest payments) and both are selling at par. Assume that the yields of both the bonds fall to8%, whether the price of bond will increase or decrease? What percentage of this increase/decrease comes from a change in the present value of bond's principal amount and what percentage of this increase/decrease comes from a change in the present value of bond's interest payments?
ii. Consider a bond selling at its par value of ₹ 1,000, with 8 years to maturity and a 9% coupon rate (with annual interest payment), what is bond's duration?
iii. If the YTM of the bond in (b) above increases to 12%, how it affects the bond's duration? And why?

(Source: FOD)

Question 37:

Tangent Ltd. is considering calling ₹ 3 crores of 30 years, ₹ 1,000 bond issued 5 years ago with a coupon interest rate of 14 per cent. The bonds have a call price of ₹ 1,150 and had initially collected proceeds of ₹ 2.91 crores since a discount of ₹ 30 per bond was offered. The initial floating cost was ₹ 3,90,000. The Company intends to sell ₹ 3 crores of 12 per cent coupon rate, 25 years bonds to raise funds for retiring the old bonds. It proposes to sell the new bonds at their par value of ₹ 1,000. The estimated floatation cost is ₹ 4,25,000. The company is paying 40% tax and its after tax cost of debt is 8 per cent. As the new bonds must first be sold and then their proceeds to be used to retire the old bonds, the company expects a two months period of overlapping interest during which interest must be paid on both the old and the new bonds. You are required to evaluate the bond retiring decision. [PVIFA 8%, 25 = 10.675]

(Source: ICAI)

Question 38:

Tata Motors Ltd. has outstanding, a high yield Bond with following features:

Face Value	100000
Coupon	12%
Maturity Period	5 Years
Special Feature	Company can extend the life of Bond to 10 years.

Presently the interest rate on equivalent Bond is 10%.

i. If an investor expects that interest will be 10%, five years from now then how much he should pay for this bond now.
ii. Now suppose, on the basis of that expectation, he invests in the Bond, but interest rate turns out to be 14%, five years from now, then what will be his potential loss/ gain if the company extents the life of Bond for another 5 years.

(Source: FOD)

Question 39:

XYZ Ltd. has the following outstanding Bonds.

Bond	Coupon	Maturity
Series A	10%	8 Years
Series B	Variable changes annually comparable to prevailing rate	8 Years

Initially these bonds were issued at face value of Rs. 1,00,000 with yield to maturity of 10%.

Assuming that:

i. After 3 years from the date of issue, interest on comparable bonds is 12%, then what should be the price of each bond?
ii. If after three additional years, the interest rate on comparable bond is 9%, then what should be the price of each bond?
iii. What conclusions you can draw from the prices of Bonds, computed above.

(Source: FOD)

Question 40:

Following are the yields on Zero Coupon Bonds (ZCB) having a face value of ₹ 10,000

Maturity (Years)	Yield to Maturity (YTM)
1	11%
2	12%
3	13%

Assume that the term structure of interest rate will remain the same.

You are required to

i. Calculate the implied one year forward rates

ii. Expected Yield to Maturity and prices of one year and two year Zero Coupon Bonds at the end of the first year.

(Source: FOD)

Question 42:

The following data is related to 8.5% Fully Convertible (into Equity shares) Debentures issued by JAC Ltd. at ₹ 1000.

Market Price of Debenture	₹ 900
Conversion Ratio	30
Straight Value of Debenture	₹ 700
Market Price of Equity share on the date of Conversion	₹ 25
Expected Dividend Per Share	₹ 1

You are required to calculate:

a. Conversion Value of Debenture

b. Market Conversion Price

c. Conversion Premium per share

d. Ratio of Conversion Premium

e. Premium over Straight Value of Debenture

f. Favourable income differential per share

g. Premium pay back period

(Source: ICAI)

Question 45:

The following is the data related to 9% Fully convertible (into Equity Shares) debentures issued by Delta Ltd. at ₹ 1000.

Market Price of 9% Debenture	₹ 1,000
Conversion Ratio (No. of shares)	25
Straight Value of 9% Debentures	₹ 800
Market price of equity share on the date of conversion	₹ 30
Expected Dividend per share	₹ 1

Analyse the value of Debenture both from cost and payback period angle for an investor who is considering to adopt the route of conversion to acquire the shares of the company.

(Source: ICAI)

Question 53:

TVS Motors Ltd. wants to issue 10% Bonds redeemable in 4 years at its face value of Rs. 100each. The annual spot yield curve for similar risk class of Bond is as follows:

Year	Interest Rate
1	13%
2	12.62%
3	12.33%
4	12.06%

i. Evaluate the expected market price of the Bond if it has a Beta value of 1.05 due to its popularity because of lesser risk.
ii. Interpret the nature of the above yield curve and reasons for the same.

Note: Use PV Factors upto 4 decimal points and value in Rs. upto 2 decimal points.

(Source: FOD)

Question 59:

The Investment portfolio of a bank is as follows:

Government Bond	Coupon Rate	Purchase rate (F.V. ₹ 100 per Bond)	Duration (Years)
G.O.I. 2026	11.68	106.00	3
G.O.I. 2030	7.55	104.00	6
G.O.I. 2035	7.38	105.50	7
G.O.I. 2042	8.35	109.00	8
G.O.I. 2052	7.95	102.00	12

Face value of total Investment is ₹7 crores in each Government Bond.

Calculate actual Investment in portfolio.

What is a suitable action to churn out investment portfolio in the following scenario?

i. Interest rates are expected to lower by 75 basis points.
ii. Interest rates are expected to raise by 25 basis points.

Also calculate the revised duration of investment portfolio in each scenario.

(Source: FOD)