FAVOURABLE INCOME DIFERENTIAL PER SHARE, PREMIUM PAY BACK PERIOD ETC.

QUESTION NO.29A *(RTP)*

Face Value	`1000	Market Price of Convertible Debenture	`900
Conversion Ratio	30	Straight Value of Debenture	`700

8.5% Fully Convertible (into Equity shares) Debentures

Market Price of Equity share	` 25	Expected Dividend Per Share	`1

You are required to calculate: (a) Fair Conversion Value of Debenture As On Today OR Conversion Value of Debenture **(b)** Conversion Parity Price Of Equity Shares OR Market Conversion Price **(c)** Conversion Parity Price Premium per Equity share OR Conversion Premium Per Share **(d)** Ratio of Conversion Parity Price Premium OR Ratio of Conversion Premium **(e)** Downside Risk or Premium over Straight Value of Debenture **(f)** Favourable income differential per share **(g)** Premium pay back period

Solution:

(a) Conversion Value of Debenture = 25 x 30 = `750; **(b) Parity Price** = $\left[\dfrac{\text{MV of CB}}{\text{Convarision Ratio}}\right] = \left[\dfrac{900}{30}\right]$ = `30

(c) Parity Price Premium = 30 - 25 = `5; **(d) Parity Price Premium (%)** = $\left[\dfrac{30-25}{25}\right]$ = 20%

(e) Down Side Risk : in `:** 900 - 700 = `200; **in %: $\left[\dfrac{900-700}{700}\right]$ = 28.57 or $\left[\dfrac{900-700}{900}\right]$ = 22.22

(f) Favourable income differential per share

If not converted: Income p.a = 1000 x 8.5% = `85; **if converted:** 30 share x `1 = `30

$\therefore$ (Favourable) Income difference = `85 - `30 = `55; $\therefore$ Per share: $\dfrac{85-30}{30 \text{ No.of ES}}$ = 1.833 per share

(g) Premium pay back period: Premium PBP = $\dfrac{\text{Extra Initial Investment}}{\text{Extra Annual CF}} = \dfrac{150}{55}$ = 2.73 Years

CALCULATION OF FACE VALUE WHEN DIFFERENCE BETWEEN TWO BO IS GIVEN

QUESTION NO.54 *(4 Marks)* A bond is held for a period of 45 days. The current discount yield is 6 percent per annum. It is expected that current yield will increase by 200 basis points and current market price will come down by ` 2.50. **Calculate: (i)** Face value of the Bond and **(ii)** Bond Equivalent Yield. Assume 360 days in a year.

Solution:

(i) Face Value of the Bond:

When Kd is 6% with 45days maturity period : At ` 1 face value, Present Value will be $\dfrac{1}{1+\dfrac{.06}{360}\times 45}$ = 0.9925

When Kd is 8% with 45days maturity period : At ` 1 face value, Present Value will be $\dfrac{1}{1+\dfrac{.08}{360}\times 45}$ = 0.9900

Time is really the only capital that any human being has, and the only thing he can't afford to lose.

Difference in Price at ` 1 Face Value = 0.0025 ;

So when difference is .0025, face value is ` 1; When difference is 1, face value will be $\frac{1}{.0025}$

When difference is 2.5, face value will be $\frac{1}{.0025} \times 2.5$ = ` 1,000

Also Current Market Price in each case will be:
When Discount Rate is 6%
When ` 1 is face value,CMP is 0.9925,therefore when ` 1000 is face value, CMP will be 1000 x 0.9925 = 99.25
When Discount Rate is 8%
When ` 1 is face value, CMP is 0.9900, therefore when ` 1000 is face value, CMP will be 1000 x 0.9900 = 90.90
(ii) Bond Equivalent Yield (or Simply Return or Holding Period Return)

At the rate of 6% ** = $\frac{1000 - 992.50}{992.50} \times \frac{360}{45} \times 100 = 6.05\%$; **At the rate of 8% = $\frac{1000 - 990}{990} \times \frac{360}{45} \times 100 = 8.08\%$

QUESTION NO.58D The following data are available for a bond:
Face Value ` 10,000 to be redeemed at par on maturity ; Coupon rate 8.5% per annum ; Years to Maturity 5 years
Yield to Maturity (YTM) 10 per cent **You are required to calculate**:
(i) Current market price of the Bond, **(ii)**Macaulay's Duration, **(iii)**Volatility of the Bond, **(iv)**Convexity of the Bond,
(v) Expected market price, if there is a decrease in the YTM by 200 basis points
(a) By Macaulay's Duration based estimate **(b)**By Intrinsic Value Method.

Years	1	2	3	4	5
PVIF (10%, n)	0.909	0.826	0.751	0.683	0.621
PVIF (8%, n)	0.926	0.857	0.794	0.735	0.681

Solution:
(i)Current Market Price of Bond
= ` 850 (PVAF 10%, 5) + ` 10,000 (PVF 10%, 5) = ` 850 (3.79) + ` 10,000 (0.621) = ` 3,221.50 + ` 6,210 = ` 9,431.5
(ii)Macaulay's Duration

Year	Cash flow	P.V. @ 10%		Proportion of bond value	Proportion of bond value x time (years)
1	850	0.909	772.65	0.082	0.082
2	850	0.826	702.10	0.074	0.148
3	850	0.751	638.35	0.068	0.204
4	850	0.683	580.55	0.062	0.248
5	10,850	0.621	6,737.85	0.714	3.57
			9431.50	1.000	4.252

Duration of the Bond is 4.252 years

(iii)Volatility of Bond: Volatility of Bonds = $\frac{Duration}{(1+YTM)} = \frac{4.252}{1.10} = 3.865$

(iv)Convexity of Bond

Year	Cash flow	P.V. @ 8%		P.V @12%	
1	850	0.926	787.10	0.892	758.20
2	850	0.857	728.45	0.797	677.45
3	850	0.794	674.90	0.712	605.20
4	850	0.735	624.75	0.636	540.60

Think big.Think positive.Think to do Different.Think to achieve.
Drop of water in lake has no identity, but if it falls on lotus, it shines like pearl.

5	10,850	0.681	7388.85	0.567	6,151.95
			10204.05		8,733.40

Approximate Modified Convexity $= \dfrac{B_+ + B_- - 2B_0}{2 \times B_0(\Delta y)^2} = \dfrac{10204.05 + 8733.40 - 2(9431.5)}{2 \times 9431.5(0.02)^2} = 9.867$

Convexity of Bond = 9.867 x (0.02)^2 x 100 = 0.395% [**Additional Analysis:** This part is added extra by Institute. This part is not 100% correct. However students can add this point in exam, whenever convexity points comes in exam, in all above questions also like Q.58A; B ;C]

(v)The expected market price if decrease in YTM by 200 basis points.

(A)By Macaulay's duration-based estimate: % Change(Increase) in Bond Value = 3.865 x .02 = .0773

Hence expected market price is ` 9431.50 + ` 9431.50 x .0773 = ` 10,160.55

Hence, the market price will increase. In other words, if YTM decreases, Bond Value will increase.

(B)By Intrinsic Value method

Year	Cash flow	P.V. @ 8%	
1	850	0.926	787.10
2	850	0.857	728.45
3	850	0.794	674.90
4	850	0.735	624.75
5	10,850	0.681	7388.85
			10204.05

WHEN BOND IMMUNIZATION CONCEPT FAILS

QUESTION NO.59 *(12 Marks)* The following data are available for three bonds A, B and C. These bonds are used by a bond portfolio manager to fund an outflow scheduled in 6 years. Current yield is 9%. All bonds have face value of `100 each and will be redeemed at par. Interest is payable annually.

Bond	Maturity (Years)	Coupon rate
A	10	10%
B	8	11%
C	5	9%

(i)Calculate the duration of each bond.

(ii) The bond portfolio manager has been asked to keep 45% of the portfolio money in Bond A. **Calculate** the percentage amount to be invested in bonds B and C that need to be purchased to immunise the portfolio.

(iii) After the portfolio has been formulated, an interest rate change occurs, increasing the yield to 11%. The new duration of these bonds are: Bond A = 7.15 years, Bond B = 6.03 years and Bond C = 4.27 years the portfolio still immunized? Why or why not?

(iv)Determine the new percentage of B and C bonds that are needed to immunize the portfolio. Bond A remaining at 45% of the portfolio.

Present values be used as follows:

Present Values	t1	t2	t3	t4	t5
PVIF$_{0.09,t}$	0.917	0.842	0.772	0.708	0.650

Present Values	t6	t7	t8	T9	t10
PVIF$_{0.09,t}$	0.596	0.547	0.502	0.460	0.4224

Solution:

You don't hear things that are bad about your company unless you ask.
It is easy to hear good things, but you have to scratch to get the bad news.

(i)Calculation of Bond Duration

Bond A

Year	Cash flow	PVF@ 9%	PV	Weights	Weights x time (years)
1	10	0.917	9.17	0.086	0.086
2	10	0.842	8.42	0.079	0.158
3	10	0.772	7.72	0.073	0.219
4	10	0.708	7.08	0.067	0.268
5	10	0.650	6.50	0.061	0.305
6	10	0.596	5.96	0.056	0.336
7	10	0.547	5.47	0.051	0.357
8	10	0.502	5.02	0.047	0.376
9	10	0.460	4.60	0.043	0.387
10	110	0.4224	46.46	0.437	4.370
			106.40	1.000	6.862

Duration of the bond is 6.862 years or 6.86 years.

Bond B

Year	Cash flow	PVF@ 9%	PV	Weights	Weights x time (years)
1	11	0.917	10.087	0.091	0.091
2	11	0.842	9.262	0.083	0.166
3	11	0.772	8.492	0.076	0.228
4	11	0.708	7.788	0.070	0.280
5	11	0.650	7.150	0.064	0.320
6	11	0.596	6.556	0.059	0.354
7	11	0.547	6.017	0.054	0.378
8	111	0.502	55.722	0.502	4.016
			111.224	1.000	5.833

Duration of the bond B is 5.833 years or 5.84 years Bond C

Year	Cash flow	PVF@ 9%	PV	Weights	Weights x time (years)
1	9	0.917	8.253	0.082	0.082
2	9	0.842	7.578	0.076	0.152
3	9	0.772	6.948	0.069	0.207
4	9	0.708	6.372	0.064	0.256
5	109	0.650	70.850	0.709	3.545
			100.00	1.000	4.242

Duration of the bond C is 4.242 years or 4.24 years

(ii) Amount of Investment required in Bond B and C

Alt 1: .45 x 6.862 + Wb x 5.833 + (1-.45 - Wb) x 4.242 = 6 or Wb = .363125 or 36.31%; Therefore Wc = 18.69 %

Alt 2:

Period required to be immunized	6.000 Years
Less: Period covered from Bond A	3.087 Years
To be immunized from B and C	2.913 Years

Let proportion of investment in Bond B and C is b and c respectively then b + c = 0.55; 5.883b + 4.242c = 2.913

On solving these equations, the value of b and c comes 0.3534 or 0.3621 and 0.1966 or 0.1879 respectively and accordingly, the % of investment of B and C is 35.34% or 36.21% and 19.66 % or 18.79% respectively.

Note: Any Alternative can be used in exam

Do not mix the words with your mood because you will have many options to change the mood but you will never get any option to replace the spoken words.

(iii) With revised yield the Revised Duration of Bond stands

0.45 x 7.15 + 0.36 x 6.03 + 0.19 x 4.27 = 6.20 years

Comment: No portfolio is not immunized as the duration of the portfolio has been increased from 6 years to 6.20 years.

(iv) New percentage of B and C bonds that are needed to immunize the portfolio.

Alt 1: .45 x 7.15 + Wb x 6.03 + (1 - .45 - Wb) x 4.27 = 6

or 3.2175 + 6.03 Wb + 2.3485 - 4.27Wb = 6 or 1.76 Wb = .434 or Wb = 24.66%; Therefore Wc = 30.34 %

Alt 2:

Period required to be immunized	6.0000 Years
Less: Period covered from Bond A	3.2175 Years
To be immunized from B and C	2.7825 Years

Let proportion of investment in Bond B and C is b and c respectively, then b + c = 0.55; 6.03b + 4.27c = 2.7825

On solving these equations, the value of b and c comes 0.2466 and 0.3034 respectively and accordingly, the % of investment of B and C is 24.66% or 25% and 30.34 % or 30.00% respectively.

YIELD CURVE

QUESTION NO.60 ABC Ltd. wants to issue 9% Bonds redeemable in 5 years at its face value of ` 1,000 each. **The annual spot yield curve for similar risk class of Bond is as follows:**

Year	**1**	**2**	**3**	**4**	**5**
Interest Rate	12%	11.62%	11.33%	11.06%	10.80%

(i) Evaluate the expected market price of the Bond if it has a Beta value of 1.10 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 ` upto 2 decimal points.

Solution:

(i) For finding expected market price first we shall calculate Intrinsic Value of Bond as follows:

PV of Interest + PV of Maturity Value of Bond

Forward rate of interests

1st Year	12%
2nd Year	11.62%
3rd Year	11.33%
4th Year	11.06%
5th Year	10.80%

$$\text{PV of interest} = \frac{90}{(1+0.12)} + \frac{90}{(1+0.1162)^2} + \frac{90}{(1+0.1133)^3} + \frac{90}{(1+0.1106)^4} + \frac{90}{(1+0.1080)^5}$$

= ` 90 x 0.8929 + ` 90 x 0.8026 + ` 90 x 0.7247 + ` 90 x 0.6573 + ` 90 x 0.5988

= ` 80.36 + ` 72.23 + ` 65.22 + ` 59.16 + ` 53.89 = ` 330.86

$$\text{PV of Maturity Value of Bond} = \frac{1000}{(1+0.1080)^5} = ` 1,000 \times 0.5988 = ` 598.80$$

Intrinsic value of Bond = ` 330.86 + ` 598.80 = ` 929.66

Expected Price = Intrinsic Value x Beta Value = ` 929.66 x 1.10 = ` 1,022.63
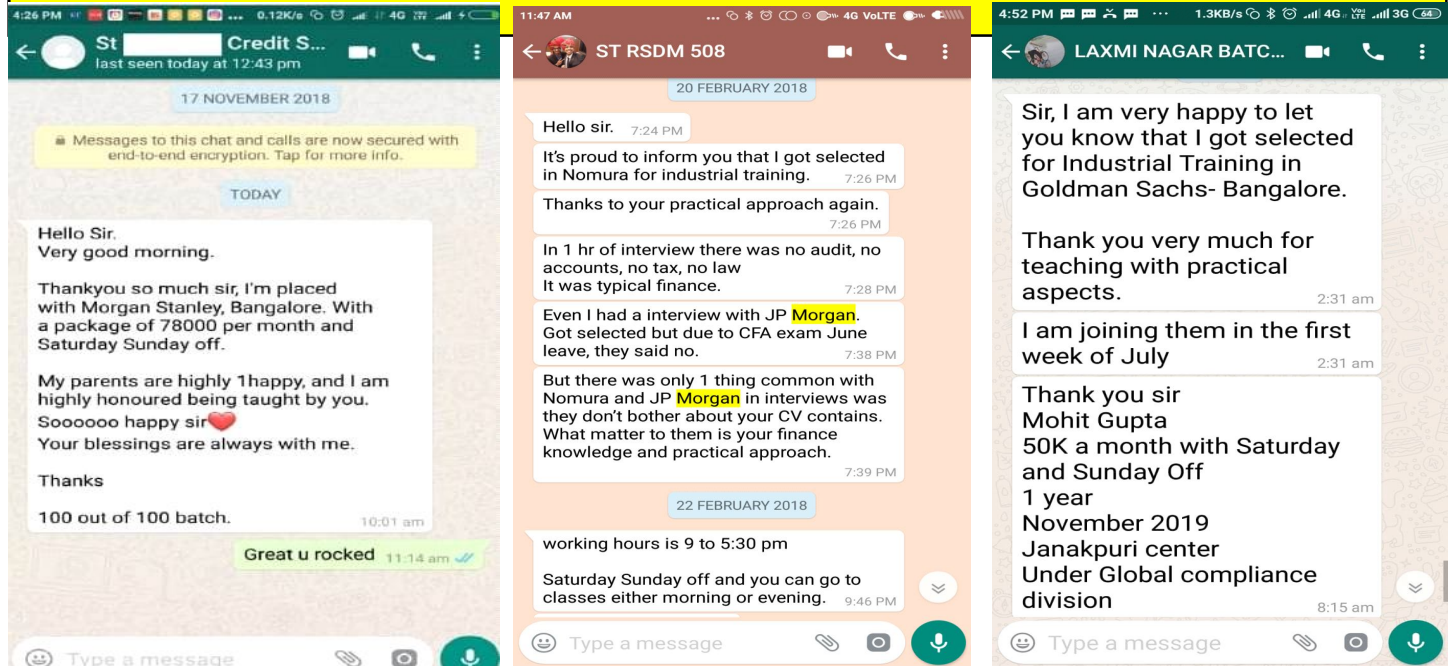
(ii) The given yield curve is inverted yield curve.

The main reason for this shape of curve is expectation for forthcoming recession when investors are more interested in Short-term rates over the long term.

If you want to build a positive attitude, learn the phrase, "do it now" and stop the habit of procrastination.

50000+STIPEND

FOR INTER QUALIFIED- ARTICLESHIP IN INVESTMENT BANKING FIRM

..NOW FINANCE MANAGER OF ITC

100 OUT OF 100 IN SFM

"Every successfull person has a painfull story".."Every painfull story has a successfull ending" ... Accept the pain & get ready to success..