CA-Final AFM Test 1
Topics Covered: Security Valuation
Max Marks: 40 Time: 1 Hour 15 Mins

Question 1(5 Marks): Following information is related to the Convertible Bond of A Ltd. which is currently priced at Rs 1060 per Bond:
(1) Conversion Parity Price - Rs 53
(2) Conversion Premium – 10.41667%
(3) Percentage of Downside Risk with respect to Straight Value of Bond – 12.766%
Calculate:(i) No. of shares on Conversion.
(ii) Current Market Price Per Share of A Ltd. (iii) Straight Value of Bond

Question 2(8 Marks): An investor has recently purchased substantial number of 7 year 6.75% Rs 1,000 bond with 5% premium payable on maturity at a required Yield to Maturity (YTM) of 9%. However, due to a financial crunch he is looking to sell these bonds and has got a proposal from another investor, who is willing to purchase these bonds by shelling out a maximum amount of Rs 897 per bond. Investors follow intrinsic value method for valuation of bonds.
(i) You are required to determine
(1) The Market Price, Duration and Volatility of the bond and
(2) Required YTM of the new investor using IRR Technique
(ii) What is relationship between the price of the bond and YTM?

Period (t)	1	2	3	4	5	6	7
PVIF (9%, t)	0.917	0.842	0.772	0.708	0.650	0.596	0.547

Question 3 (5 Marks): You are an investment analyst working for a financial advisory firm. You have been asked to analyze the bond market's yield curve to assist your clients in making investment decisions. The yield curve represents the relationship between the interest rates (yield) and the time to maturity for debt securities, usually government bonds. For simplicity, assume the following yield data for government bonds over various maturities (measured in years)

Maturity (Years)	Yield (%)
1 Year	3.00%
2 Years	4.00%
3 Years	5.00%
5 Years	6.00%
7 Years	6.40%
10 Years	7.00%
15 Years	7.40%
30 Years	7.60%

Based on above case scenario answer the following questions:
I. The main characteristic of a normal yield curve is…….
(a) Short-term yields are higher than long-term yields.
(b) Short-term yields are lower than long-term yields.
(c) Yields remain the same across all maturities.
(d) Yields fluctuate randomly over different maturities.
II. Based on the revised yield data, what is the yield spread between the 10- year bond and the 1-year bond?

(a) 2.0% (b) 3.5% **(c) 4.0%** (d) 5.0%

III. An inverted yield curve typically indicates……
(a) Economic growth (b) Economic uncertainty
(c) An upcoming recession (d)Inflationary pressure

IV. If an investor is looking to invest for 2 years starting 3 years from now, the forward rate he would expect shall be……
(a) 7.41% **(b) 7.52%** (c) 7.76% (d) 7.93%

V.If an investor is looking to invest for 2 years starting 5 years from now, the forward rate he would expect shall be……
(a) 7.41% (b) 7.52% (c) 7.76% (d) 7.93%

Question 4(5 Marks): Bank A enter into a Repo for 14 days with Bank B in 10% Government of India Bonds 2028 @ 5.65% for Rs 8 crore. Assuming that clean price (the price that does not have accrued interest) be Rs 99.42 and initial Margin be 3% and days of accrued interest be 272 days.
You are required to calculate:
(i) Dirty Price (ii) Approximate Repayment amount at maturity.
Note: (1) Consider 360 days in a year. (2) Round off calculations upto 2 decimals points.

Question 5(7 Marks): ABC Ltd. has Rs 600 million, 12 per cent bonds outstanding with six years remaining to maturity. Since interest rates are falling, ABC Ltd. is contemplating of refunding these bonds with a Rs 600 million issue of 6 year bonds carrying a coupon rate of 10 per cent. Issue cost of the new bond will be Rs 12 million and the call premium is 4 per cent. Rs 18 million being the unamortized portion of issue cost of old bonds can be written off no sooner the old bonds are called off. Marginal tax rate of ABC Ltd. is 30 per cent. Examine the bond refunding decision. [PVIFA (7%, 6 years) = 4.766] Note: Carry out calculations in Rs Million and round off calculations upto 4 decimal points.

Question 6(5 Marks): Rohan Ltd. has surplus cash of Rs 150 lakhs and wants to distribute 35% of it to the shareholders. The company decides to buy back shares. The Finance Manager of the company estimates that its share price after re-purchase is likely to be 15% above the buyback price-if the buyback route is taken. The number of shares outstanding at present is 10 lakhs and the current EPS is Rs 3. DETERMINE:
(i) The price at which the shares can be re-purchased, if the market capitalization of the company should be Rs 320 lakhs after buyback,
(ii) The number of shares that can be re-purchased, and
(iii) The impact of share re-purchase on the EPS, assuming that net income is the same.

Question 7(5 Marks): An investor is considering purchasing the equity shares of LX Ltd., whose current market price (CMP) is 150. The company is proposing a dividend of Rs 6 for the next year. LX is expected to grow @ 18% per annum for the next four years. The growth will decline linearly to 14% per annum after first four years. Thereafter, it will stabilize at 14% per annum infinitely. The required rate of return is 18% per annum. You are required to determine:
(i) The intrinsic value of one share
(ii) Whether it is worth to purchase the share at this price

T	1	2	3	4	5	6	7	8
PVIF (18, t)	0.847	0.718	0.609	0.516	0.437	0.370	0.314	0.266

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(3) Percentage of Downside Risk with respect to Straight Value of Bond – 12.766%
Calculate:
(i) No. of shares on Conversion.
(ii) Current Market Price Per Share of A Ltd.
(iii) Straight Value of Bond

Answer:

(i) The No. of share on Conversion shall be computed as follows:
Conversion Parity Price = Bond Price/ No. of shares on Conversion
Rs 53 = 1060/No. of shares on Conversion
Accordingly, No. of shares on Conversion = 20
(ii) To determine current Market Price Per Share of A Ltd. we shall use Conversion Premium as follows:
Conversion Premium = Market Price of Bond - Conversion Value of Bond
Conversion Value of Bond
0.1041667 = (1060 - Conversion Value of Bond)/ Conversion Value of Bond
Conversion Value of Bond = Rs 960
Since the No. of share on Conversion = 20
The current market price of share of A Ltd. shall be = Rs 960/ 20 = Rs 48 per share
(iii) To determine the Straight Value of Bond we shall use Percentage of Downside Risk as follows:
Percentage of Downside Risk = (Market Price of Bond - Straight Value of Bond)/Straight Value of Bond
0.12766 = (1060 - Straight Value of Bond)/Straight Value of Bond
Straight Value of Bond = Rs 940 per Bond

Question 2(8 Marks): An investor has recently purchased substantial number of 7 year 6.75% Rs 1,000 bond with 5% premium payable on maturity at a required Yield to Maturity (YTM) of 9%. However, due to a financial crunch he is looking to sell these bonds and has got a proposal from another investor, who is willing to purchase these bonds by shelling out a maximum amount of Rs 897 per bond. Investors follow intrinsic value method for valuation of bonds.
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PVIF (9%, t)	0.917	0.842	0.772	0.708	0.650	0.596	0.547

Answer:

(1)(A) Market Price of Bond
= 1,000 X 6.75% X (PVIAF 9%,7) + 1,050 X (PVIF 9%,7)
= 67.50 X 5.032 + 1050 X 0.547
= 339.66 + 574.35 = Rs 914.01

(B) Duration of Bond (Follow Class presentation)

Year	Cash flow	P.V. @ 9%		Proportion of bond value	Proportion of bond value x time (years)
1	67.50	0.917	61.898	0.0677	0.0677
2	67.50	0.842	56.835	0.0622	0.1244
3	67.50	0.772	52.110	0.0570	0.1710
4	67.50	0.708	47.790	0.0523	0.2092
5	67.50	0.650	43.875	0.0480	0.2400
6	67.50	0.596	40.230	0.0440	0.2640
7	1117.50	0.547	611.273	0.6688	4.6816
			914.011		5.7579

Duration of the Bond is 5.758 years

(C) Volatility of Bond-

Volatility = Duration/(1+YTM) = 5.758/(1+0.09) = 5.28

(2) Required yield of new Investor

= 67.50 PVIAF (r, 7) + 1050 X PVIF (r, 7)

Now, let us discount the cash flow by 9% PV @ 9% = 67.50 X 5.032 + 1050 X 0.547

= 339.66 + 574.35 = 914.01

NPV @ 9% = 914.01 – 897 = Rs17.01

Since, NPV of bond is positive, We need to increase discount rate say 12%

= 67.50 PVIAF (12%,7) + 1050 X PVIF (12%,7)

= 67.50 X [0.893 + 0.797 + 0.712 + 0.636 + 0.567 + 0.507 + 0.452] + 1050 X 0.452

= 67.50 X 4.564 + 474.60

= 308.07 + 474.60= 782.67

NPV @ 12% = 782.67 - 897= - Rs114.33

Use interpolation formula = YTM= 9.39%

Note: it is preferable to consider 10 percent as the higher rate

(ii) Relationship between the price of the bond & YTM is opposite or inverse

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Yield Curve Table

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You are required to calculate:

(i) Dirty Price

(ii) Approximate Repayment amount at maturity.

Note: (1) Consider 360 days in a year.

(2) Round off calculations upto 2 decimals points.

Answer:

Dirty Price = Clean Price + Accrued Interest

= 99.42 + 100*10%*272/360 = 106.98

First Leg = Nominal Value *Dirty Price/100 *(1-Initial Margin%) = 8,30,16,480

Second Leg(Repayment) = First Leg + Interest at Repo Rate for 14 days = 8,31,98,886

Question 5(7 Marks): ABC Ltd. has Rs 600 million, 12 per cent bonds outstanding with six years remaining to maturity. Since interest rates are falling, ABC Ltd. is contemplating of refunding these bonds with a

Rs 600 million issue of 6 year bonds carrying a coupon rate of 10 per cent. Issue cost of the new bond will be Rs 12 million and the call premium is 4 per cent. Rs 18 million being the unamortized portion of issue cost of old bonds can be written off no sooner the old bonds are called off. Marginal tax rate of ABC Ltd. is 30 per cent. Examine the bond refunding decision.

[PVIFA (7%, 6 years) = 4.766]

Note: Carry out calculations in Rs Million and round off calculations upto 4 decimal points.

Answer:

	(i) Calculation of initial outlay:-	
	a. Face value	Rs (million) 600
	Add:-Call premium	24
	Cost of calling old bonds	624
	b. Gross proceed of new issue	600
	Less: Issue costs	12
	Net proceeds of new issue	588
	c. Tax savings on call premium	
	and unamortized cost 0.30 (24+18)	12.60

Therefore Initial outlay = Rs 624 million – Rs 588 million – Rs 12.60 million = Rs 23.40 million

Calculation of net present value of refunding the bond:-

Saving in annual interest expensesRs (million) [600 x (0.12 – 0.10)] 12.00

Less:- Tax saving on interest and amortization

0.30 x [12 + (18-12)/6] 3.90

Annual net cash saving 8.10

PVIFA (7%, 6 years) 4.766

Present value of net annual cash saving Rs 38.6046 million

Less:- Initial outlay Rs 23.40 million

Net present value of refunding the bond Rs 15.2046 million

Decision: The bonds should be refunded

Question 6(5 Marks): Rohan Ltd. has surplus cash of Rs 150 lakhs and wants to distribute 35% of it to the shareholders. The company decides to buy back shares. The Finance Manager of the company estimates that its share price after re-purchase is likely to be 15% above the buyback price-if the buyback route is taken. The number of shares outstanding at present is 10 lakhs and the current EPS is Rs 3.

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(ii) The number of shares that can be re-purchased, and

(iii) The impact of share re-purchase on the EPS, assuming that net income is the same.

Answer:

(i) Let P be the buyback price decided by Rohan Ltd.

Market Capitalisation after Buyback

1.15P (Original Shares – Shares Bought Back)

= 1.15P [10 Lakhs - (35% of 150 lakhs)/P]

= 1.15 lakhs * P – 52.5 lakhs *1.15 = 11.50 lakhs P – 60.375 lakhs

Again, 1.15 lakhs P – 60.375 lakhs

or 11.50 lakhs P = 320 lakhs + 60.375 lakhs

or P = 380.375/ 11.50 = Rs 33.08 per share
(ii) Number of Shares to be Bought Back:
52.50 Lakhs/ 33.08 = 1,58,706 shares

(iii) New Equity Shares:
10 lakhs – 1.59 lakhs = 8.41 lakhs or 1000000 – 158706 = 841294 shares

EPS = (3 x 10 lakhs)/8.41 = Rs 3.57
Thus, EPS of Rohan Ltd., increases to Rs 3.57

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Answer:
D1 = Rs 6
D2 = Rs 6 (1.18) = Rs 7.08
D3 = Rs 6 (1.18)2 = Rs 8.35
D4 = Rs 6 (1.18)3 = Rs 9.86
D5 = Rs 9.86 (1.17) = Rs 11.54
D6 = Rs 9.86 (1.17)(1.16) = Rs 13.38
D7 = Rs 9.86 (1.17)(1.16)(1.15) = Rs 15.39
D8 = Rs 9.86 (1.17)(1.16)(1.15)(1.14) = Rs 17.54
TV7 = D8/Ke-g = 438.50
Intrinsic Value = 172.85
Since the Intrinsic Value of share is Rs 172.85 while it is selling at Rs 150 hence it is under-priced and better to acquire it.