INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT – SEMESTER-6

Marks

Q.2 (a) (i) Difference between Investor and Speculator:

	Investor	Speculator
Planning Horizon	Longer Planning Horizon (One year holding period).	Short Planning Horizon (a few days to a few months).
Risk Disposition	Not willing to assume more than moderate risk. Rare assumes high risk knowingly.	Willing to assume high risk.
Return Expectation	Moderate rate of return commensurate with the lower risk level.	High rate of return in exchange of high risk.
Basis of Decision	Greater significance to fundamental factors, carries out careful evaluation of the prospects of the firm.	Relies more on technical analysis, hearsay, and market psychology.
Leverage	Normally uses own funds and minimizes borrowed funds.	Normally resorts to borrowing to supplement own resources.

Any three (3) points @ 1 mark each = 3

(ii) Current Yield and Capital Yield:

Current Yield is the rate of return attributable to the income (e.g. dividend, coupon payments etc.) generated from an asset or investment during the period.

OR

Current Yield = Annual Income ÷ Beginning Price 1

Capital Yield is the rate of return generated from the appreciation or depreciation in the market price of the asset or investment.

OR

Capital Yield = (Ending Price – Beginning Price) ÷ Beginning Price 1

(b)

Total cost of investment	= Rs. 75 x 100	= Rs. 7,500	1
Investor's contribution	= Rs. 7,500 x 60%	= Rs. 4,500	1
Borrowed amount	= Rs. 7,500 – Rs. 4,500	= Rs. 3,000	1
Sale proceeds to the investor after paying off the borrowed amount	= (Rs. 150 x 100) – Rs. 3,000	= Rs. 12,000	1
Return on Investment	= (12,000 ÷ 4,500) – 1	= 1.67 or 167%	1

(c) The expected return and standard deviation of returns is calculated below:

Period	Return in % R_i	Deviation $(R_i - \bar{R})$	Square of Deviation $(R_i - \bar{R})^2$	
1	15	6.17	38.07	1
2	–10	–18.83	354.57	1
3	17	8.17	66.75	1
4	20	11.17	124.77	1
5	–2	–10.83	117.29	1
6	13	4.17	17.39	1
Expected Rate $(\bar{R})$ =	8.83	SUM =	718.84	

OR 3 + 3 = 6

Marks

Variance = $\frac{\Sigma(R_i - \overline{R})^2}{n-1} = \frac{718.84}{6-1}$ = 143.77 1

Standard deviation = $(143.77)^{1/2}$ = 11.99% 1

(d) The interest rate implicit in the offer of Rs.500,000 after 5 years in lieu of Rs.250,000 now is:

FVIF (r,5 years) = $\frac{\text{Rs. } 500{,}000}{\text{Rs. } 250{,}000}$ = 2.000 1

From the tables we find that:

FVIF(15%, 5years) = 2.011 1

Which means that the implied interest rate is close to 15%. 1

Hence the option of Rs.500,000 after 5 years from now must be chosen because it offers a higher rate of return than the market (12%). 1

OR

The interest rate implicit in the offer of Rs.500,000 after 5 years in lieu of Rs.250,000 now is:

Rs.250,000 x $(1+r)5$ = Rs. 500,000 1

$(1+r)^5 = \frac{500{,}000}{250{,}000}$ = 2 1

r = $(2)^{1/5} - 1$ = 1.149 – 1 = 0.149 or 14.9% 1

Since the implied rate of 14.9% is higher than the market rate of 12%, the option of Rs.500,000, 5 years from now must be chosen. 1

Q.3 (a) Beta of Stock-A:

Year	R_A	R_M	$R_A - \overline{R}_A$	$R_M - \overline{R}_M$	$(R_A - \overline{R}_A)(R_M - \overline{R}_M)$	$(R_M - \overline{R}_M)^2$
1	8	10	–	1	–	1
2	12	13	4	4	16	16
3	–3	5	–11	–4	44	16
4	10	8	2	–1	–2	1
5	13	9	5	–	–	–
Sum	40	45			58	34
Mean	8	9				

2

$\sigma_M^2 = \frac{34}{5-1}$ = 8.500 1

$Cov_{A,M} = \frac{58}{5-1}$ = 14.500 1

$\beta_A = \frac{14.5}{8.5}$ = 1.706 1

Marks

(b) (i) Covariance (A,B) = rAB x σA x σB = 0.54 x 8 x 13 = 56.16% 1

(ii) Expected return = (0.5 x 8) + (0.5 x 15) = 11.50% 1

Risk (standard deviation) = $[w^2_A \sigma^2_A + w^2_B \sigma^2_B + 2\, w_A\, w_B\, Cov\,(A,B)]^{½}$ 1

= $[0.5^2 \times 64 + 0.5^2 \times 169 + 2 \times 0.5 \times 0.5 \times 56.16]^{½}$

= $[16 + 42.25 + 28.08]^{½}$ = $[86.33]^{½}$ = 9.29% 1

Q.4 (a) (i) Current Price of the Stock:

$$P_o = \frac{D_1}{r - g}$$ 1

$$P_o = \frac{17.25}{0.1123 - 0.05} = \text{Rs. } 276.89$$ 1

(ii) Present Value of Growth Opportunities (PVGO):

$$P_o = \frac{E_1}{r} + PVGO$$ 1

$$P_o = \frac{(17.25 \div 0.65)}{0.1123} + PVGO$$ 1

276.89 = 236.32 + PVGO

PVGO = Rs. 40.57 1

(b) (i) Sustainable Growth Rate:

Retention Ratio for Year-4	=	1 – (2,063 ÷ 5,163)	= 60.00% 1
Retention Ratio for Year-5	=	1 – (3,075 ÷ 7,688)	= 60.00% 1
Average Retention Ratio	=	(60% + 60%) ÷ 2	= 60.00% 1
ROE for Year-4	=	5,163 ÷ (1,875 + 18,475)	= 25.37% 1
ROE for Year-5	=	7,688 ÷ (1,875 + 23,088)	= 30.80% 1
Average ROE	=	(25.37% + 30.80%) ÷ 2	= 28.09% 1
Sustainable growth rate	=	0.6 x 28.09	= 16.85% 1

(ii) EPS estimate for Year-6: Rs. in million

	Year-5	Year-6	
Net sales	47,500	52,250	1
Profit before interest and taxes	14,750	17,793	1
Interest	3,625	3,734	1
Profit before tax	11,125	14,059	
Tax	3,438	4,218	1
Profit after tax	7,688	9,841	1
EPS (Rs.)	41.00	52.49	1

Marks

(c) Difference between Technical Analysis and Fundamental Analysis:

Technical Analysis	Fundamental Analysis
Focuses solely on charts and past price behaviours.	Concentrates on the financial drivers.
Traders rely on various tools, indicators and patterns.	Traders follow news sources and corporate announcements.
Traders attempt to predict future price movement on the basis of past price trends.	Trades attempt to predict market sentiments driven by actual financial performance and news and economic data.
Considered to be more useful in short-term.	Observed to hold in long-term.

Any three (3) differences @ 1 mark each = 3

Q.5 (a) Terminal value of the interest proceeds = 130 x $FVIFA_{(15\%, 5)}$

= 130 x 6.742 = 876.46 1

Redemption value = 1,000

Terminal value of the proceeds from the bond = 1,000 + 876.46 = 1,876.46 1

Let 'r' be the yield to maturity. The value of 'r' can be obtained from the equation

$965 (1 + r)^5 = 1,876.46$ 1

$r = (1,876.46/965)^{1/5} - 1$ 1

= 0.1423 or 14.23% 1

(b) Value of the Issue:

No. of shares after conversion in one year = 2

Value of the shares at the price of Rs.200 = 2 x 270 = Rs. 540.00 1

PV of the convertible portion at the required rate of 16% = 540 ÷ 1.16 = Rs. 465.52 1

Payments that would be received from the debenture portion:

Year	Principal Payment	Coupon Payment	Total Payment	$PVIF_{12\%,t}$	PV
1	–	140	140	0.893	125.02
2	125	70	195	0.797	155.42
3	125	52.5	177.5	0.712	126.38
4	125	35	160	0.636	101.76
5	125	17.5	142.5	0.567	80.80
		2	+		2 = 4
				Total	589.38 1

Value of the convertible debenture = 465.52 + 589.38 = Rs. 1,054.9 1

Marks

(c) **(i)** Call Option and Put Option:

Call Option gives the option holder the right to buy the underlying asset at a fixed priced during a certain period. ½

Put Option gives the option holder the right to sell the underlying asset at a fixed priced during a certain period. ½

(ii) American Option and European Option:

American Option can be exercised on or before the exercise date. ½

European Option can be exercised only on the exercise date. ½

(d) Value of a Comparable Put Option:

According to put-call parity theorem:

$$P_o = C_0 + \frac{E}{e^{rt}} - S_0 \quad 1$$

$$= 165 + \frac{180}{e^{0.095 \times 1}} - 200 \quad 1$$

$$= 165 + \frac{180}{1.0996} - 200 \quad 1$$

$$= 165 + 163.69 - 200 = \text{Rs. } 128.69 \quad 1$$

Q.6 **(a)** Strategies for Overcoming Psychological Biases:

- Understand the Biases:

  Reflect on the biases and develop proper understanding.
- Focus on the Big Picture:

  Develop an investment policy as it will help react less impulsively to the market movements.
- Follow a Set of Quantitative Investment Criteria:

  Quantitative investment criteria provide measurable triggers for investment decision making rather than abstract actions under the influence of emotion, hearsay, rumor etc.
- Diversify:

  A fairly diversified portfolio reduces the impact of losses in one or two investments because such losses are likely to be offset by gains in other investments.
- Control Your Investment Environment:

  Control investment environment means controlling one's behavior. This control may be achieved through reducing the frequency of stock trading and portfolio reviews.
- Strive to Earn Market Returns:

  A desire to over perform the market leads to greater likelihood of getting trapped by psychological biases. Therefore, return objectives must be in line with what the market offers.
- Review Your Biases periodically:

  Review the past decisions taken under influence of psychological biases as the findings of such reviews will help contain the biases in future.

Any four (4) strategies @ 1 mark each = 4

Marks

(b) **(i)** Main Goals of a Real World Investor:

The three main goals of a real world investor are: Safety, Income and Growth. 1

(ii) Correct Asset Allocation:

Asset Type	Order of Allocation	
Stocks	4	½
Options	6	½
Residential House	2	½
Bonds	3	½
Cash	1	½
Commercial Property	5	½

(c) Constraints that Influence the Investment Policy of an Investor:

- Liquidity:

  Liquidity is the ease with which an asset can be sold without suffering any discount to its market price. Liquidity constraint is defined by the requirement of cash in the foreseeable future.

- Investment Horizon:

  Investment horizon is the time when the whole investment or a part of it is planned to be liquidated to meet a specific need of the investor.

- Taxes:

  Post-tax rate of return may vary from investment to investment due to tax rebates and shelters available on certain types of investments.

- Regulations:

  More applicable on institutional investors which are often regulated by an government authority. Regulations may require the investors to invest in certain type of security or may put an investment limit on certain assets.

- Unique Circumstances:

  Reflect the unique requirements and preferences of individual investors. For example an investor may prefer not to invest in interest bearing assets while other may chose not to buy stocks of tobacco companies.

Any four (4) constraints @ 1 mark each = 4

Marks

(d) Salient Features of Warren Buffet's Investment Philosophy:

- Turn off the Stock Market:

  Warrant Buffet is of the opinion that stock markets are too extreme (volatile) at times and one should not take direction from the market.

- Don't Worry about the Economy:

  It is as difficult to predict the economy as it is to forecast the stock market. Further, Buffet prefers to invest in businesses that do well irrespective of the state of the economy.

- Buy a Business, not a Stock:

  The investment must be viewed from the long-term perspective of a business man rather than with a short-term objective of quick money-making from stock market's movements.

- Manage a Portfolio of Business:

  Warren Buffet does not believe in maintaining a diversified portfolio of a number of stocks as he thinks it is suitable only when the investor knows nothing about the stocks. He advocates investing in a five to ten sensibly-priced businesses with in-depth knowledge about their long-term business prospects.

Any three (3) features @ 1 mark each = 3

(e) Treynor Measure $= \dfrac{\bar{R}_p - R_f}{\beta_p}$ 1

$= \dfrac{40 - 10}{1.3} = 23.08$ 1

Jensen Measure $= \bar{R}_p - [R_f + \beta_p (\bar{R}_M - R_f)]$ 1

$= 40 - [10 + 1.3(31 - 10)] = 40 - (10 + 27.3) = 2.70$ 1

THE END