PAPER – 14: Advanced Financial Management

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Time Allowed: 3 Hours **Full Marks: 100**

Section A

Answer Question No. 1 which is compulsory Carried 20 Marks.

1. (A) Each Question Carried 2 Marks: **[7×2 =14]**

(i) Earnings available to share holding = ₹ 60,000
No. of Equity Shares = 20,000
Earnings per share = $\frac{60,000}{20,000}$ = ₹ 3 per share
Market price per share = ₹ 20 per share.
Lots of Equity = $\frac{3}{20} \times 100 = 15\%$

(ii) $\beta = \frac{\rho_{GM} \times \sigma_G \times \sigma_M}{\sigma^2_M}$

ρ_{GM} = Correlation coefficient between Greaves Ltd. stock and the return of Market Index = 0.5.

σ_G = Standard deviation of returns of Greaves Ltd. stock = 24%

σ_M = Standard deviation of market return Index = 20%

$\beta_G = \frac{0.5 \times 0.24 \times 0.20}{(0.20)^2} = 0.6$

(iii)

Market Value of Investment	= 300 × 25	= ₹ 7,500
Purchase rate of unit	= 25 × 1.05	= ₹ 26.25
Total purchase consideration	= 26.25 × 300	= ₹ 7,875
Increase in value	= 300 × 25 × 0.15	= ₹ 1,125
Expenses	= 0.02 × 300 × 25	= ₹ 150
Rate of Returns	$= \frac{1,125 - 150}{7,875} \times 100$	= 12.38%

(iv) 1 French Franc = 20 US cents.
French Franc appreciated by 10%
∴ 1 French Franc = 20 US cents × (1 + 10%)
1 French Franc = 22 US cents
∴ 1 US cents = $\frac{1}{22}$ French Franc
= 0.0454 French Franc
∴ 1 US $ = 0.04545 × 100
= 4.545 French Francs.

(v) Present value factor at 10% Invest = 3.791
Installment amount payable at end of the year = $\frac{20,00,000}{3.791}$ = ₹ 5,27,565.

(vi) 1 Swedish Krones = $ 0.14
Swedish Kornes appreciated by 10%
1 Swedish Korne = $ 0.14 (1 + 0.10) = 0.154

1 $ = $\frac{1}{0.154}$ Swedish Korne

1 $ = 6.49351 Swedish Krones.

(vii) Future value = Present Value $\left(\frac{1+r}{m}\right)^{m \times n}$

r = Interest rate = 5.5% (or) 0.055
m = No. of time compounded in a year = 2
n = No. of years = 2

$= 1000 \left(\frac{1+0.055}{2}\right)^{2 \times 2}$

= 1000 [1.1146]
= 1114.62.

(B) State if each of the following sentences is T (=true) or F (= false), Each Question carries 1 Mark [6 × 1=6]

(i) False
(ii) False
(iii) True
(iv) False
(v) False
(vi) False

Section B

Answer any 5 Question from the following. Each Question Carried 16 Marks.

2. (a)

(i) Replacement of Machine – R

Incremental Cash Outflow:

Particulars	₹
(i) Cash outflow on Machine – S	2,50,000
Less: Sale value of Machine – R	
Less: Cost of Dismantling and Removal (₹ 1,00,000 – ₹ 30,000)	70,000
Net Outflow	1,80,000
(ii) Incremental Cash Flow from Machine – S	
Annual cash flow from Machine - S	2,70,000
Less: Annual cash flow from Machine – R	2,50,000
Net Incremental cash inflow	20,000

Present value of Incremental cash inflows:
= ₹ 20,000 × (0.8696 + 0.7561 + 0.6575 + 0.5717 + 0.4972)
= ₹ 20,000 × 3.3523 = ₹ 67,046.

NPV of Machine – S = ₹ 67,046 – ₹ 1,80,000 = (-) ₹ 1,12,954

Decision: Since Net Present value of Machine – S is negative, replacement is not advised.

Note: ₹ 2,00,000 spent on Machine – R is a sunk cost and hence it is not relevant for deciding the replacement.

If the company is in the process of selecting one of the two machines, the decision is to be made on the basis of independent evaluation of two machines by comparing their Net Present Values.

(ii) Independent evaluation of Machine – R and Machine – S.

Particulars	Machine - R	Machine – S
Units Produced	1,50,000	1,50,000
Selling price per unit (₹)	6	6
Sale value	9,00,000	9,00,000
Less: Operating Cost (Exclusive of depreciation)	2,00,000	1,80,000
Contribution	7,00,000	7,20,000
Less: Fixed cost	4,50,000	4,50,000
Annual cash flow	2,50,000	2,70,000
Present value of cash flows for 5 years	8,38,075	9,05,121
Cash outflow	2,00,000	2,50,000
Net Present Value	6,38,075	6,55,121

As the NPV of cash inflow of Machine – S is higher than that of Machine – R, choice should fall on Machine – S

Note; As the company is a zero-tax company for seven years (Machine life in both cases is only for five years), depreciation and tax effect on the same are not relevant for consideration.

(b) Project X

NPV Estimated	Probability	NPV Estimate × Probability	Deviation from Expected NPV i.e., ₹ 90,000	Square of deviation	Square of deviation × Probability
₹		₹		₹	₹
30,000	0.1	3,000	60,000	3,60,00,00,000	36,00,00,000
60,000	0.4	24,000	30,000	90,00,00,000	36,00,00,000
1,20,000	0.4	48,000	-30,000	90,00,00,000	36,00,00,000
1,50,000	0.1	15,000	-60,000	3,60,00,00,000	36,00,00,000
Expected NPV		90,000			1,44,00,00,000

Project Y

NPV Estimated	Probability	NPV Estimate × Probability	Deviation from Expected NPV i.e., ₹ 90,000	Square of the deviation	Square of the deviation × Probability
₹		₹		₹	₹
30,000	0.2	6,000	60,000	3,60,00,00,000	72,00,00,000
60,000	0.3	18,000	30,000	90,00,00,000	27,00,00,000
1,20,000	0.3	36,000	-30,000	90,00,00,000	27,00,00,000
1,50,000	0.2	30,000	-60,000	3,60,00,00,000	72,00,00,000
Expected NPV		90,000			1,98,00,00,000

(i) The expected Net Present Value of Projects × and Y is ₹ 90,000 each.

(ii) Standard Deviation = $\sqrt{\text{Square of the deviation} \times \text{Probability}}$

In case of Project X : Standard Deviation = $\sqrt{₹1,44,00,00,000}$ = ₹ 37,947.

In case of Project Y : Standard Deviation = $\sqrt{₹1,98,00,00,000}$ = ₹ 44,497.

(iii) Co-efficient of Variation = $\frac{\text{Standard Deviation}}{\text{Expected Net Present Value}}$

In case of Project X : Standard Deviation = $\frac{37,947}{90,000}$ = 0.42.

In case of Project Y : Standard Deviation = $\frac{44,497}{90,000}$ = 0.4944 (or) 0.5.

Project Y is riskier since it has higher co-efficient of variation.

3. (a) Given:

Risk free rate of return = R_f = 7%

Market rate of return = R_m = 14%

Computation of weighted Beta (i.e., Beta of the Portfolio):

Security	Amount Invested	Proportion of Investment to Total Investment	Beta of Investment	Weighted Beta
(1)	(2)	(3) = (2) ÷ 9,05,000	(4)	(5) = (3) × (4)
Oxy Rin Ltd.	80,000	0.09	0.45	0.041
Boxed Ltd.	1,50,000	0.17	0.35	0.059
Square Ltd.	2,25,000	0.25	1.15	0.288
Ellipse Ltd.	4,50,000	0.49	1.85	0.907
Total	9,05,000	1		1.295

Computation of Expected Return on Portfolio (Under CAPM):

Expected Return $[E(R_P)] = R_F + \beta_P \times (R_M - R_F)$

$= 7\% + [1.295 \times (14\% - 7\%)]$

$= 7\% + [1.295 \times 7\%]$

$= 7\% + 9.065\% = 16.065\%$.

(b) Calculation of growth g = 0.25 × 30

= 7.5%

Calculation of K_e under CAPM

$K_e = 6 + 0.75\ (8)$

$K_e = 12\%$.

$P_0 = \frac{D_1}{K_e - g} = \frac{8.0625}{12 - 7.5} = 179.16$.

Given company's share price = 150.

∴ 179.16 > 150.

The share is undervalued.

4. (a) (i) Computation of Price of Futures contract

Particulars	
Spot Price (S_x)	₹ 5,000
Dividend Yield Expected (y)	6% (or) 0.06

Tenor / Time Period (t) in years	4 months (or) 0.3333 year
Risk Free Interest Rate (r)	9% (or) 0.09
Price of Future Contract (TFP_x) $TFP_x = S_x \times e^{(r-y)xt}$	= ₹ 5,000 × $e^{(0.09 - 0.06) \times 0.3333}$ = ₹ 5,000 × $e^{0.03 \times 0.3333}$ = ₹ 5,000 × $e^{0.01}$ = ₹ 5,000 × 1.0101 = ₹ 5,050.5

Therefore, Price of Futures Contract is ₹ 5,050.5 (or) 5.050 (approx)

(ii) Gain on short Futures Position

(a) Computation of No. of Contracts to be Entered

Particulars	Value
Portfolio Value	₹ 10,10,000
4-Month's Future Price per unit of BSE Index	₹ 5,050
No. of Units per BSE Index Futures Contract	50
Value per BSE Index (Futures Contract [50 units × ₹ 5,050 per unit]	₹ 2,52,500
No. of Contracts to be entered $\left[\frac{\text{Portfolio Value} \times \text{Beta of Portfolio w.r.t. Index}}{\text{Value per BSE Index Futures Contract}}\right] = \left[\frac{₹ 10,10,000 \times 1.5}{₹ 2,52,500}\right]$	6 Contracts

(b) Computation of gain on short Futures Position

Particulars	Value
Position	Sell
Contracted sale price per unit of BSE Index	₹ 5,050
Less: Index Position in 3-months	₹ 4,500
Gain per unit of BSE Index Future	₹ 550
No. of Units per contract	50
Gain per contract (₹ 550 × 50 units)	₹ 27,500
No. of Contracts entered into	6
Total gain (6 contracts × ₹ 27,500 per contract)	₹ 1,65,000

Total gain on short Futures Position in 3 months is ₹ 1,65,000.

(b) Basic Data:

Factor	Notation	Value (₹)
Current Market Price	S	₹ 165
Option Exercise price	x	₹ 150
Time	t	2
Risk free rate of return	r	6% or 0.06
Standard deviation of return	σ	15% or 0.15

$$d_1 = \frac{\left[Ln\left(\frac{S}{x}\right) + (r + 0.50\sigma^2) \times t\right]}{\sigma\sqrt{t}}$$

$$= \frac{\left[\text{Ln}\left(\frac{165}{150}\right) + (0.06 + 0.50 \times (0.15)^2) \times 2\right]}{0.15 \times \sqrt{2}}$$

$$= \frac{\text{Ln}(1.1) + 0.1425}{0.212}$$

$$= \frac{0.09531 + 0.1425}{0.212}$$

$$= 1.12$$

$d_2 = d_1 - \sigma \sqrt{t}$ $= 1.12 - 0.15 \times \sqrt{2}$
$= 1.12 - 0.212$
$= 0.908$ or 0.91 (approx)

So, $N(d_1) = N(1.12) = 0.8686$
$N(d_2) = N(0.91) = 0.8186$

Hence, value of call option = $[S \times N(d_1)] - [X \times e^{-rt} \times N(d_2)]$
$= [165 \times 0.8686] - [150 \times e^{-0.06 \times 2} \times 0.8186]$
$= 143.320 - 150 \times 0.8869 \times 0.8186$
$= 143.320 - 108.90$
$= 34.42.$

5. (a) Computation of Expected Return Under CAPM

$E(R_x) = R_f + \text{Beta} \times (R_m - R_f)$
Risk free Return = $R_f = 4.5\%$
Return on Market portfolio = $R_m = \frac{153}{1000} = 15.30\%$
Beta of equity-stable = 1.35
Expected return of equity – stable
= 4.50% + [1.35 × (15.30% - 4.50%)]
= 19.08%.

Computation of Alpha Factor of 3 funds.

Year	Mutual Funds x		Mutual Funds y		Mutual Funds z	
	Actual Return	Abnormal Return	Actual Return	Abnormal Return	Actual Return	Abnormal Return
1	17.35%	17.35 – 19.08 = (1.73)	17.2%	17.20 – 19.08 = (1.88)	17.10%	17.10 –19.08= (1.98)
2	18.70%	18.70 – 19.08 = (0.38)	18.25%	18.25 – 19.08 = (0.83)	18.60%	18.60 –19.08= (0.48)
3	21.60%	21.60 – 19.08 = 2.52	22.15%	22.15 – 19.08 = 3.07	22.00%	22.00 –19.08 = 2.92
		0.41		0.36		0.46

Alpha Factor:

Fund x = $\frac{0.41}{3}$ years = 0.137%

Fund y = $\frac{0.36}{3}$ years = 0.120%

Fund z = $\frac{0.46}{3}$ years = 0.153%

Evaluation : Equitable scheme of Mutual Fund z has the highest alpha 0.153% return more than the market expectations when compared to 0.137% and 0.120% of fund x and y. therefore, the fund manager of Mutual Fund z has performed better.

Ranking : Fund Manager z = 1
Fund Manager x = 2
Fund Manager y = 3

5. (b) (i) Exchange rate in Mumbai (Purchase power parity Theorem)
Exchange rate in Mumbai per $ = Bag Price in ₹ at Mumbai/Bag Price in $at New York
= ₹ 4250 ÷ USD 105
= ₹ 40.4762.

(ii) Price in a year's time
Mumbai = Prevailing Price × (1 + Increase in Rate)
= ₹ 4250 × (1 + 7%)
= ₹ 4250 × 1.07 = ₹ 4,547.50

New York = Prevailing Price × (1 + Increase in Rate)
= USD 105 × 1.04
= USD 109.20.

(iii) Exchange Rate in New York (after one year)
Exchange Rate in New York per ₹ 100
= (Bag Price in $ at New York / Bag Price in ₹ at Mumbai) × ₹ 100
= (USD 109.20 ÷ ₹ 4.547.50) × ₹ 100
= USD 2.4013.

(iv) Depreciation (in %) of ₹ over the year
Depreciation = [(1 + Indian Inflation Rate) ÷ (1 + New York Inflation Rate)] – 1
= [(1 + 7%) ÷ (1 + 4%)] – 1
= 1.07 ÷ 1.04 – 1
= 2.88%.

Alternatively:
(Future Spot Rate ₹ / $ - Spot Rate of ₹ / $) ÷ Spot Rate × 100

Future Spot = Bag Price in Mumbai ÷ Bag Price in New York in one year
= ₹ 4,547.5 / USD 109.20
= ₹ 41.6438.

Depreciation = (Future Spot Rate – Spot Rate) ÷ Spot Rate × 100
= (₹ 41.6438 – ₹ 40.4762) ÷ Rs 40.4762 × 100
= ₹ 1.1676 ÷ ₹ 40.4762 × 100 = 2.88%.

6. (a) (1) NAV as at 31.03.2010

Particulars	₹
Annualised Yield	153.33%
Yield for 9 months (From 1.7.2009 till 31.03.2010) = (153.33 × 9 ÷ 12)	115%
Return for 9 months (Investment ₹ 1,00,000 × 115%)	₹ 1,15,000

Less: Dividends at 10% of Opening Value (10,000 Units × ₹ 10 × 10%)	(₹10,000)
Net Capital Application	₹1,05,000
Closing NAV (Investment ₹ 1,00,000 + Capital Appreciation ₹ 1,05,000)	₹2,05,000
No. of Units outstanding	10,000
NAV per unit	₹ 20.50
Dividends are Reinvested at ₹ 20.50. Therefore, additional units purchased as at 31.03.2010 (Dividends ₹ 10,000 ÷ NAV P.U. ₹ 20.50)	487.80
Total No. of Units as at 31.03.2010 (after Re-investment of dividend)	10,487.80

(2) NAV as at 31.12.2011

Particulars	₹
Units outstanding as at 31.12.2011	10,487.80
Face value at ₹ 10 (10,487.80 units × ₹ 10 p.u.)	₹ 1,04,878
Dividends distributed at 20% (₹ 1,04,878 × 20%)	₹ 20,975.6
No. of units as at 31.03.2012 (given)	11,296.11
Less: No. of units as at 31.12.2011	10,487.80
No. of Units issued against Re-investment of dividend	808.31
Dividends will be reissued at the NAV as at 31.12.2011. Therefore, NAV = Dividends ÷ No. f Units reissued = ₹ 20,975.60 ÷ 808.31 units.	₹ 25.95

(3) NAV as at 31.03.2012

Particulars	₹
Annaulised yield as on 31.03.2012	73.52%
Yield for 33 months (from 1.7.2009 till 31.03.2012) = (73.52 × 33 ÷ 12)	202.18
Return for 33 months (investment ₹ 1,00,000 × 202.18%)	₹ 2,02,180
Add: Opening Investment	₹ 1,00,000
Closing Fund Value (dividends need not be excluded since they are excluded)	₹ 3,02,180
No. of Units outstanding as at 31.03.2012	11,296.11
NAV per unit (₹ 3,02,180 ÷ 11,296.11 units.)	₹ 26.75

(b) The following particulars furnished about three Mutual Fund Schemes P, Q and R.

Particular	Scheme P	Scheme Q	Scheme R
Dividend Distributed	₹ 1.75	--	₹ 1.30
Add: Capital Appreciation	₹ 2.97	₹ 3.53	₹ 1.99
Total Return [A]	₹ 4.72	₹ 3.53	₹ 3.29
Opening NAV	₹ 32.00	₹ 27.15	₹ 23.50
Actual Return [A] ÷ [B] = [C]	14.75% [4.72 ÷ 32.00]	13.00% [3.53 ÷ 27.15]	14.00% [3.29 ÷ 23.50]
Beta [D]	1.46	1.10	1.40
Expected Return Under CAPM $[E(R_p)] = R_f + \beta_p \times (R_m - R_f)$	14.56% (6.84 + 1.46) × (12.13 – 6.84)	12.66% (6.84 + 1.10) × (12.13 – 6.84)	14.25% (6.84 + 1.40) × (12.13 – 6.84)
Jensen's Alpha (σ_p) (c) – (E)	0.18% (14.75 – 14.57)	0.34% (13.00 – 12.66)	(0.25%) (14.00 – 14.25)
Ranking	2	1	3

Evaluation: Schemes P and Q have outperformed the Market Portfolio (NIFTY), where as scheme R has under-performed in comparison with the NIFTY.

7. (a) The Betas of the two stocks:

Aggressive stock = $\frac{40 - (-5)}{26 - 5} = \frac{45}{21} = 2.143$

Defensive stock = $\frac{22\% - 7\%}{26\% - 5\%} = \frac{15}{21} = 0.714$

(b) Expected Return of two Stocks

Aggressive stock = 0.5 × (5%) + 0.5 × 40% = 17.5%

Defensive stock = 0.5 × 7% + 0.5 × 22% = 14.5%

(c) Expected Return on Market portfolio

= 0.5 × 5% + 0.5 × 26% = 15.5%

Market risk premium = 15.5% - 8% = 7.5%

Therefore, SML is required return = 8% + βi 7.5%

(d) $R_s = \alpha + \beta R_m$

Where

α = alpha

β = Beta

R_m = Market Return

For Aggressive Stock

$17.5 = \alpha_A + 2.143 \times 15.5\%$

$\alpha_A = -15.72$

For Defensive Stock

$14.5\% = \alpha_D + 0.714 \times 15.5\%$

$\alpha_D = 3.433$

(b) **Regulatory measures taken by FMC:**

(1) Illegal contracts

Following are the scenarios, in which the contracts are termed as illegal contracts,

(a) Forward Contracts in the permitted commodities, i.e., commodities notified under S.15 of the Forward Contracts (Regulation) Act, 1952, which are entered into other than: (a) between the members of the recognized Association or (b) through or (c) with any such members.

(b) Forward contracts in prohibited commodities, which are described under section 17 of forward contract act.

(c) Forward Contracts in the commodities in which such contracts have been prohibited.

(2) Measures against Illegal Forward Trading

(a) The role of Forward Markets Commission is to communicate the information relating to offences under the Act to the police authorities and assist such authorities in their work such as accompanying the police in conducting searches for documents etc.

(b) The offences under the Act are technical in nature and it is difficult to prove the charges in accordance with the rules of evidence contained in the Evidence Act. So, the Forward Markets Commission periodically conducts training programs, Seminars, Workshops etc. for the benefit of Police Officers/Prosecutors and also Judicial Magistrates First Class/Metropolitan Magistrates.

(3) Rules governing illegal Forward Contracts

(a) Owner of a place which is used for performing illegal forward contracts, with the knowledge of such owner.

(b) A person who, without permission of the Central Government, organizes illegal forward contract.

(c) Any person who willfully misrepresents or induces any person to believe that he is a member of a recognized association or that forward contract can be performed through him.

(d) Any person who is not a member of a recognized association canvasses, advertises or touts in any business connected with forward contracts in contravention of the Forward Contracts (Regulation) Act, 1952.

(e) Any person who joins, gathers, or assists in gathering at any place other than the place of business specified in the bye-laws of the recognized associations for making bids or offers or for entering into illegal forward contracts.

(f) Any person who makes publishes or circulates any statement or information, which is false and which he knows to be false, affecting or tending to affect the course of business in forward contracts in permitted commodities.

8. Write a short note on any four of the following

(a) Forward VS Future

	Forward	Futures
Standardization	Forwards not standardized contracts, they are only private contracts	These are standardized contracts which are traded in stock exchanges
Price Negotiation	Prices are negotiated between buyer and seller directly	Prices are market determined. No single buyer or seller can influence
Liquidity	No liquidity as forwards cannot be traded in stock exchanges.	Highly liquid, as futures are traded in exchanges
Contract Closure	Contracts will be settled by delivery.	Settlement may be by delivery. Or, by paying the price differential. Or, by taking an offsetting position
Margins	None	Yes
Guarantor	Nobody will be there as a guarantor on behalf of the seller or the buyer	Clearing house guarantees for settlement. That's the reason why clearing house insists for margin money.

(b) Money Market Mutual Funds

MMMFs are the funds that mobilize savings from individuals and small investors and then invest these savings in money Market.

MMMFs thereby increase the participants in Money Market and enable the individual and small investors to indirectly participate and benefit out of Money market

MMMFs were operated under the RBI Guidelines from 1992 till March 2000 after that the RBI decided that MMMFs should also be brought within the purview of SEBI to ensure investor's 2000. SEBI (MF) Regulations 1996 are applicable to the MMMFs as well. Under these Regulations **a MMMF means a scheme of mutual fund which has been set up with the objective of investing exclusive in the money market instruments.**

For this purpose, the money market instruments include commercial papers, commercial bills, treasury bills, government securities having unexposed maturity upto one year, call

or notice money, certificates of deposit, usance bills, and any other like instruments as specified by the RBI from time to time.

(c) Green Shoe Option

The name Green Shoe Option comes from the name of a company. A company named Green Shoe Company first granted a right to its underwrites that they can be allotted 10% - 15% more shares if the issue is over subscribed.
Company's Act 1956 provides that the public issue should be treated as cancelled if the subscription for it is below 90% of issue size. To avoid this contingency the issuer company generally enters into an agreement with underwriters for the purchase of the required number of shares to reach the dead line of 90% subscription, in case the issue is under - subscribed.

However, in case the issue is oversubscribed, it is natural to think that underwriters should be suitably awarded.

When the public issue opens it remains open for certain period. During this period when the floatation is on, the issuer company can observe the demand of shares. If the demand is high for the shares and the issue is still open, SEBI guide lines allow the issuer company to accept oversubscription to a certain limit say 15%. This is green shoe option which denotes an option of allocating shares in excess of the shares include in public issue. It can be understood as an option that allows the underwriters to buy and resell additional shares up to a certain pre-determined quantity. Thus under this option the issuer company can issue additional shares on the public issue. This option is extensively used in international IPOs to stabilize the share price immediately after listing. This option is getting popularity in India recently.

(d) Capital Market Line VS Security Market Line

The two terms, CML and SML, though sound somewhat similar, represent different things. The CML describes the percentage holdings in the risk - free asset and the risky diversified market portfolio. The line is also sometimes referred to as borrowing lending line. The CML equation is:

$$E(r_p) = \frac{r_f + E(r_m) - r_f\sigma_p}{\sigma_m}$$

Where,

$E(r_p)$ = Expected return on portfolio p
Rf = Risk free rate
σ_p = Risk of portfolio p
$E(r_m)$ = Expected return on market portfolio

The CML tells the return an investor should get for a given level of risk. The SML graphs individual asset risk premiums as a function of asset risk. It actually depicts the relationship between systematic risk and return. The equation is:

$$E(r_i) = r_f + \beta_i[E(r_m)-r_f]$$

Where,

$E(r_i)$ = Expected return on security
rf = Risk - free rate
$E(r_m)$ = Expected return on market portfolio
β_i= Index for systematic risk for security

The above two lines differ in two significant respects. The first one relates to risk measures. In the CML case, risk in measured by standard deviation, which is total risk. In the SML case, risk is measured by beta (β), which measures the security's risk contribution, to market portfolio. It is a relative measure. A security's beta is given by:

$$\beta_i = \frac{Cov(i,m)}{\sigma^2_m}$$

Where,
Cov(i, m) = covariance of returns between security and market portfolio.
σ^2_p = Variance of market return

The other significant difference between the CML and the SML relates to the nature of the portfolio with which each is concerned. The CML graph defines only efficient portfolio whereas the SML graph defines both efficient and non-efficient portfolio of securities

(e) Capital Rationing

Capital Rationing refers to a situation where the firm is constrained for external or self-imposed, reasons to obtain necessary funds to invest in all profitable investment projects. Capital Rationing exists when funds available for investment are inadequate to undertake all Projects which are otherwise acceptable.

Capital rationing may arise due to -
1. External Constraints, or
2. Internal Constraints imposed by management

External capital Rationing arises out of the inability of the firm, to raise sufficient funds from the market at a given cost of capital.

Internal Capital Rationing is caused by self - imposed restriction by management to its Capital Expenditure outlays.

The selection process under Capital rationing will involve two steps:
1. Ranking of projects according to some measure of profitability - P.I., BCR, NPV, IRR etc.
2. Selecting projects in descending order of profitability until the budget figures are exhausted keeping in view the objective of maximizing the value of the firm.