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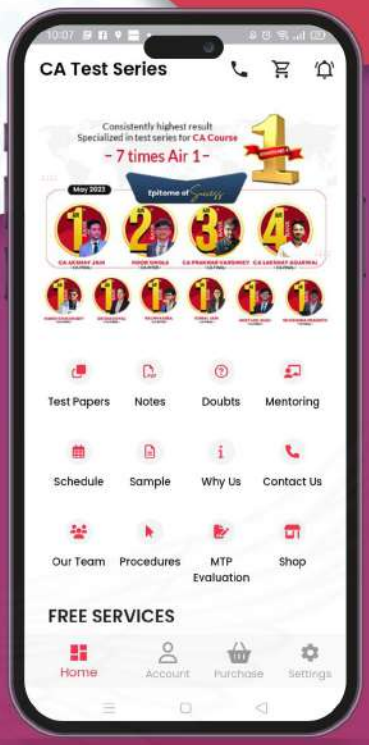

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AFM

100 IMPRORANT QUESTIONS

Question 1: Discuss briefly the key decisions falling within the scope of financial strategy

Or

As a financial strategist you will depend on certain key financial decisions. Discuss.

Answer 1: The key decisions falling within the scope of financial strategy include the following:

1. Financing decisions: These decisions deal with the mode of financing or mix of equity capital and debt capital,

2. Investment decisions: These decisions involve the profitable utilization of firm's funds especially in long- term projects (capital projects). Since the future benefits associated with such projects are not known with certainty, investment decisions necessarily involve risk. The projects are therefore evaluated in relation to their expected return and risk.

3. Dividend decisions: These decisions determine the division of earnings between payments to shareholders and reinvestment in the company.

4. Portfolio decisions: These decisions involve evaluation of investments based on their contribution to the aggregate performance of the entire corporation rather than on the isolated characteristics of the investments themselves.

Question2: Discuss on Balancing Financial Goals vis-a-vis Sustainable Growth

Or

Often, a conflict can arise if growth objectives are not consistent with the value of the organization's sustainable growth. EXPLAIN.

Answer2: The concept of sustainable growth can be helpful for planning healthy corporate growth. This concept forces managers to consider the financial consequences of sales increases and to set sales growth goals that are consistent with the operating and financial policies of the firm. Often, a conflict can arise if growth objectives are not consistent with the value of the organization's sustainable growth. Question concerning right distribution of resources may take a difficult shape if we take into consideration the rightness not for the current stakeholders but for the future stakeholders also. To take an illustration, let us refer to fuel industry where resources are limited in quantity and a judicial use of resources is needed to cater to the need of the future customers along with the need of the present customers. One may have noticed the save fuel campaign, a demarketing campaign that deviates from the usual approach of sales growth strategy and preaches for conservation of fuel for their use across generation. This is an example of stable growth strategy adopted by the oil industry as a whole under resource constraints and the long run objective of survival over years. Incremental growth strategy, profit strategy and pause strategy are other variants of stable growth strategy.

Sustainable growth is important to enterprise long-term development. Too fast or too slow growth will go against enterprise growth and development, so financial should play important role in enterprise development, adopt suitable financial policy initiative to make sure enterprise growth speed close to sustainable growth ratio and have sustainable healthy development.

Sustainable Growth Rate

The sustainable growth rate (SGR), concept by Robert C. Higgins, of a firm is the maximum rate of growth in sales that can be achieved, given the firm's profitability, asset utilization, and desired dividend payout and debt (financial leverage) ratios. The sustainable growth rate is a measure of how much a firm can grow without borrowing more money. After the firm has passed this rate, it must borrow funds from another source to facilitate growth. Variables typically include the net profit margin on new and existing revenues; the asset turnover ratio, which is the ratio of sales revenues to total assets; the assets to equity ratio; and the retention rate, which is defined as the fraction of earnings retained in the business. SGR = ROE x (1-Dividend payment ratio)

Sustainable growth models assume that the business wants to:

1) Maintain a target capital structure without issuing new equity;

2) Maintain a target dividend payment ratio; and

3) Increase sales as rapidly as market conditions allow.

Since the asset to beginning of period equity ratio is constant and the firm's only source of new equity is retained earnings, sales and assets cannot grow any faster than the retained earnings plus the additional debt that the retained earnings can support. The sustainable growth rate is consistent with the observed evidence that most corporations are reluctant to issue new equity. If, however, the firm is willing to issue additional equity, there is in principle no financial constraint on its growth rate. Indeed, the sustainable growth rate formula is directly predicted on return on equity.

Economists and business researchers contend that achieving sustainable growth is not possible without paying heed to twin cornerstones:

- Growth strategy and
- Growth capability.

Companies that pay inadequate attention to one aspect or the other are doo med to fail in their efforts to establish practices of sustainable growth (though short-term gains may be realized). After all, if a company has an excellent growth strategy in place but has not put the necessary infrastructure in place to execute that strategy, long-term growth is impossible. The reverse is also true.

The very weak idea of sustainability requires that the overall stock of capital assets should remain constant. The weak version of sustainability refers to preservation of critical resources to ensure support for all, over a long-time horizon. The strong concept of sustainability is concerned with the preservation of resources under the primacy of ecosystem functioning. These are in line with the definition provided by the economists in the context of sustainable development at macro level.

The sustainable growth model is particularly helpful in situations in which a borrower requests additional financing. The need for additional loans creates a potentially risky situation of too much debt and too little equity. Either additional equity must be raised, or the borrower will have to reduce the rate of expansion to a level that can be sustained without an increase in financial leverage.

Mature firms often have actual growth rates that are less than the sustainable growth rate. In these cases, management's principal objective is finding productive uses for the cash flows that exist in excess of their needs. Options available to business in such cases includes returning the money to shareholders through increased dividends or common stock repurchases, reducing the firm's debt load, or increasing possession of lower earning liquid assets. These actions serve to decrease the sustainable growth rate. Alternatively, these firms can attempt to enhance their actual growth rates through the acquisition of rapidly growing companies.

Growth can come from two sources: Increased volume and inflation. The inflationary increase in assets must be financed as though it were real growth. Inflation increases the amount of external financing required and increases the debt-to-equity ratio when this ratio is measured on a historical cost basis. Thus, if creditors require that a firm's historical cost debt-to-equity ratio stay constant, inflation lowers the firm's sustainable growth rate.

Question 3: State the strategy at different hierarchy levels.

Answer 3: Strategies at different levels are the outcomes of different planning needs.

Three levels of Strategy-Corporate level; Business unit level; and Functional or departmental level.

(1) Corporate Level Strategy: Corporate level strategy fundamentally is concerned with selection of businesses in which a company should compete and with the development and coordination of that portfolio of businesses.

Corporate level strategy should be able to answer three basic questions:

❖ **Suitability:** Whether the strategy would work for the accomplishment of common objective of the company.

❖ **Feasibility:** Determines the kind and number of resources required to formulate and implement the strategy.

❖ **Acceptability:** It is concerned with the stakeholders' satisfaction and can be financial and non-financial.

(2) Business Unit Level Strategy: Strategic business unit (SBO) may be any profit center that can be planned independently from the other business units of a corporation. At the business unit level, the strategic issues are about practical coordination of operating units and developing and sustaining a competitive advantage for the products and services that are produced.

(3) Functional Level Strategy: The functional level is the level of the operating divisions and departments. The strategic issues at this level are related to functional business processes and value chain. Functional level strategies in R&D, operations, manufacturing, marketing, finance, and human resources involve the development and coordination of resources through which business unit level strategies can be executed effectively and efficiently. Functional units of an organization are involved in higher level strategies by providing input to the business unit level and corporate level strategy, such as providing information on customer feedback or on resources and capabilities on which the higher-level strategies can be based. Once the higher level strategy is developed, the functional units translate them into discrete action plans that each department or division must accomplish for the strategy to succeed.

Among the different functional activities viz production, marketing, finance, human resources and research and development, finance assumes highest importance during the top down and bottom-up Interaction of planning. Corporate strategy deals with deployment of resources and financial strategy are mainly concerned with mobilization and-effective utilization of money, the most critical resource that a business firm likes to have under its command. Truly speaking, other resources can be easily mobilized if the firm has adequate monetary base. To go into the details of this interface between financial strategy and corporate strategy and financial planning and corporate planning let us examine the basic issues addressed under financial planning.

Question 4: What is sustainable growth rate?

(i) What makes an Organization Sustainable?

(ii) Mr. X has submitted the following data:

Particulars	(Rs) in lakh
Total assets	250
Total liabilities	220
Net income	12
Dividend paid	4.5
Sales	100

Mr. X wants to know to what extent sales can be increased without going for additional borrowings by using Sustainable Growth Rate (SGR) concept?

Answer4:

(1) The sustainable growth rate is a measure of how much a firm can grow without borrowing more money. After the firm has passed this rate, it must borrow funds from another source to facilitate growth.

(ii) In order to be sustainable, an organization must:

- have a clear strategic direction;
- be able to scan its environment or context to identify opportunities for its work;
- be able to attract, manage and retain competent staff;
- have an adequate administrative and financial infrastructure;
- be able to demonstrate its effectiveness and impact in order to leverage further resources, and
- get community support for, and involvement in its work.

(iii)

SI.NO	Particulars	Amount in Rs lakhs
A	Total assests	250.00
B	Total liabilities	220.00
C	Net income	12.00
D	Dividend paid	4.50
E	Sales	100.00
F	Equity (a) –(b)	30.00
G	Return on equity (ROE) (c)/(f)	40.00%
H	Dividend pay-out ratio (d)/(c)	37.50%
I	SGR [g × (1-h)]	25.00%*
J	Additional sales can be achieved without further borrowings (e) ×(i)	25.00
k	Maximum sales can be achieved without further borrowings (e)×(j)	125.00

* Alternatively, it can also be computed as follows:

SGR = $\frac{g\,(1-h)}{1-[\,g\,(1-h)]}$ = 33.33% and then Additional Sales shall be Rs 33.33 Lakhs and Maximum Sales can be achieved without further borrowings shall be Rs 133.33 Lakhs

Question5: Explain the features of Value-at-Risk (VAR).

Answer 5: Following are main features of VAR

(i) Components of Calculations: VAR calculation is based on following three components:

(a) Time Period

(b) Confidence Level - Generally 95% and 99%

(c) Loss in percentage or in amount

(ii) Statistical Method: It is a type of statistical tool based on Standard Deviation.

(iii) Time Horizon: VAR can be applied for different time horizons say one day, one week, one month and so on.

(iv) Probability: Assuming the values are normally attributed, probability of maximum loss can be predicted.

(v) Control Risk: Risk can be controlled by selling limits for maximum loss.

(vi) Z Score: z score indicates how many standard Deviations is away from Mean value of a population. When it is multiplied with Standard Deviation it provides VAR.

Question 6: Explain some of the parameters to identify the currency risk.

Answer6: The various hints that may provide counter party risk are as follows:

(a) Failure to obtain necessary resources to complete the project or transaction undertaken.

(b) Any regulatory restrictions from the Government.

(c) Hostile action of foreign government.

(d) Let down by third party.

(e) Have become insolvent.

The various techniques to manage this type of risk are as follows:

(1) Carrying out Due Diligence before dealing with any third party.

(2) Do not over commit to a single entity or group or connected entities.

(3) Know your exposure limits.

(4) Review the limits and procedure for credit approval regularly,

(5) Rapid action in the event of any likelihood of defaults.

(6) Use of performance guarantee, insurance or other instruments.

OR

Some of the parameters to identity the currency risk are as follows:

(1) Government Action: The Government action of any country has visual impact in its currency. For example, the UK Govt. decision to divorce from European Union i.e., Brexit brought the pound to its lowest since 1980's.

(2) Nominal Interest Rate: As per interest rate parity (IRP) the currency exchange rate depends on the nominal interest of that country.

(3) Inflation Rate: Purchasing power parity theory impact the value of currency.

(4) Natural Calamities: Any natural calamity can have negative impact.

(5) War, Coup, Rebellion etc.: All these actions can have far reaching impact on currency's exchange rates.

(6) Change of Government: The change of government and its attitude towards foreign investment also helps to identify the currency risk.

Question7: ABC Ltd. is considering a project X, which is normally distributed and has mean return of Rs. 2 crore with Standard Deviation of Rs. 1.60 crore.

In case ABC Ltd. loses on any project more than Rs. 1.00 crore there will be financial difficulties.

Determine the probability the company will be in financial difficulty.

Given: Standard Normal Distribution Table (Z-Score) providing area between Mean and Z score

Z score	Area
1.85	0.4678
1.86	0.4686
1.87	0.4693
1.88	0.4699
1.89	0.4706

Answer7: For calculating probability of financial difficulty, we shall calculate the area under Normal Curve corresponding to the Z Score obtained from the following equation (how many SD is away from Mean Value of financial difficulty):

$$z = \frac{\times - \mu}{\sigma}$$

$$= \frac{-1.00 \text{ crore} - 2.00 \text{ crore}}{1.60 \text{ crore}} = -1.875 \text{ say } 1.875$$

corresponding area from z score table by using interportation shall be follow as:

Z score	Area under normal curve
1.87	0.4693
1.88	0.4699
0.01	0.0006

The corresponding value of 0.005 Z score = $0.005 \times \frac{0.0006}{0.01} = 0.0003$

Thus, the value of 1.875 shall be = 0.4693 + 0.0003 = 0.4696

Thus, the probability the company shall be in financial difficulty is 46.96%

Question 8: DESCRIBE Value at Risk and its application.

Answer 8: VAR is a measure of risk of investment. Given the normal market condition in a set of periods, say, one day it estimates how much an investment might lose. This investment can be a portfolio, capital investment or foreign exchange etc., VAR answers two basic questions -

(i) What is worst case scenario?

(ii) What will be loss?

It was first applied in 1922 in New York Stock Exchange, entered the financial world in 1990s and become world's most widely used measure of financial risk.

Features of VAR

Following are main features of VAR

(i) Components of Calculations: VAR calculation is based on following three components:

(a) Time Period

(b) Confidence Level-Generally 95% and 99%

(c) Loss in percentage or in amount

(ii) Statistical Method: It is a type of statistical tool based on Standard Deviation.

(iii) Time Horizon: VAR can be applied for different time horizons say one day, one week, one month and so on.

(iv) Probability: Assuming the values are predicted. normally attributed, probability of maximum loss can be

(v) Control Risk: Risk can be controlled by selling limits for maximum loss.

(vi) Z Score: z score indicates how many standard Deviations is away from Mean value of a population. When it is multiplied with Standard Deviation it provides VAR.

Application of VAR

VAR can be applied

(i) To measure the maximum possible loss on any portfolio or a trading position.

(ii) As a benchmark for performance measurement of any operation or trading.

(iii) To fix limits for individuals dealing in front office of a treasury department.

(iv) Enable the management to decide the trading strategies.

(v) As a tool for Asset and Liability Management especially in banks.

Question 9: Briefly discuss the concept of Purchasing Power Parity. (RTP Nou (19)

Answer 9: Purchasing Power Parity (PPP): Purchasing Power Parity theory focuses on the inflation exchange rate relationship. There are two forms of PPP theory: -

The ABSOLUTE FORM, also called the 'Law of One Price' suggests that "prices of similar products of two different countries should be equal when measured in a common currency". If a discrepancy in prices as measured by a common currency exists, the demand should shift so that these prices should converge.

The RELATIVE FORM is an alternative version that accounts for the possibility of market imperfections such as transportation costs, tariffs, and quotas. It suggests that 'because of these market imperfections, prices of similar products of different countries will not necessarily be the same when measured in a common currency. However, it states that the rate of change in the prices of products should be somewhat similar when measured in a common currency, as long as the transportation costs and trade barriers are unchanged.

The formula for computing the forward rate using the inflation rates in domestic and foreign countries is as follows:

$$F=S\frac{(1+i_D)}{(1+i_F)}$$

Where F= Forward Rate of Foreign Currency and S= Spot Rate

ID Domestic Inflation Rate and

IF Inflation Rate in foreign country

Thus, PPP theory states that the exchange rate between two countries reflects the relative purchasing power of the two countries i.e., the price at which a basket of goods can be bought in the two countries.

Question 10: What is Value at Risk? Identify its main features. (RTP May 20)

Answer 10: VAR is a measure of risk of investment. Given the normal market condition in a set of periods, say, one day it estimates how much an investment might lose. This investment can be a portfolio, capital investment or foreign exchange etc., VAR answers two basic questions

(i) What is worst case scenario?

(ii) What will be loss?

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Following are main features of VAR

(i) Components of Calculations: VAR calculation is based on following three components:

(a) Time Period

(b) Confidence Level-Generally 95% and 99%

(c) Loss in percentage or in amount

(ii) Statistical Method: It is a type of statistical tool based on Standard Deviation.

(iii) Time Horizon: VAR can be applied for different time horizons say one day, one week, one month and so on.

(iv) Probability: Assuming the values are normally attributed, probability of maximum loss can be predicted.

(v) Control Risk: Risk can be controlled by selling limits for maximum loss.

(vi) 2 Score: Z Score Indicates how many standard Deviations is away from Mean value of a population. When it is multiplied with Standard Deviation it provides VAR.

Question 11: On Tuesday morning (before opening of the capital market) an investor, while going through his bank statement, has observed that an amount of Rs. 7 lakhs is lying in his bank account. This amount is available for use from Tuesday till Friday. The Bank requires a minimum balance of Rs. 1000 all the time. The investor desires to make a maximum possible investment where Value at Risk (VaR)-should not exceed the balance lying in his bank account. The standard deviation of market price of the security is 1.5 per cent per day. The required confidence level is 99 percent.

Given

Standard normal probabilities										
Z	0.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9998	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9923	.9925	.9929	.9931	.9932	.9934	.9936

Answer11:

Particulars	**Amount (Rs.)**
Amount available in bank account	7,00,000

Minimum balance to be kept	1,000
Available amount which can be used for potential investment for 4 days	6,99,000
Maximum loss for 4 days at 99% level	6,99,000
Maximum loss for 1 day at 99% level = maximum loss 4 days / √No. of days =699000/√4	3,49,500
Z score at 99% level	2.33
Volatility in terms of rupees (maximum loss/z score at 99% level) =349500/2.33	1,50,000
Maximum possible investment (volatility in rupee/std deviation) =150000/0.15	1,00,00,000

Question 12: Briefly explain:

(a) Compliance risk and

(b) Operational risk

Answer 12:

(a) Compliance Risk: Every business needs to comply with rules and regulations. For example, with the advent of Companies Act, 2013, and continuous updating of SEBI guidelines, each business organization has to comply with plethora of rules, regulations and guidelines. Noncompliance leads to penalties in the form of fine and imprisonment. However, when a company ventures into a new business line or a new geographical area, the real problem then occurs. For example, a company pursuing cement business likely to venture into sugar business in a different state but laws applicable to the sugar mills in that state are different. So, that poses a compliance risk. If the company fails to comply with laws related to a new area or industry or sector, it will pose a serious threat to its survival.

(b) Operational Risk: This type of risk relates to internal risk. It also relates to failure on the part of the company to cope with day-to-day operational problems. Operational risk relates to 'people' as well as 'process'. We will take an example to illustrate this.

For example, an employee paying out 1,00,000 from the account of the company instead of Rs 10,000, This is a people as well as a process risk. An organization can employ another person to check the work of that person who has mistakenly paid $1,00,000 or it can install an electronic system that can flag off an unusual amount.

Question 13: Following is the information about Mr. J's portfolio:

Investment in shares of ABC Ltd	Rs.200 lakhs
Investment in shares of XYZ Ltd	Rs.200 lakhs
Daily standard deviation of both shares	1%
Co-efficient of correlation between both shares	0.3

Required:

Determine the 10 days 99% Value at Risk (VAR) for Mr. J's portfolio. Given: The Z score from the Normal Table at 99% confidence level is 2.33. (Show your calculations up to four decimal points). (PYP 4 Marks Nov '19)

Answer 13: Volatility (standard deviation) of the daily change in the investment in each share in terms of rupees-

1% of Rs. 200 lakhs Rs. 2 lakhs

The variance of the portfolio's daily change - V = 22+22+ 2 x 0.3 x 2 x 2 = 10.4 lakh

Standard Deviation of the portfolio's daily change = √10.4 = Rs. 3.2249 Lakhs

The standard deviation of the 10-day change

Rs. 3.2249 Lakhs x √10= Rs. 10.1981 lakhs

Therefore, the 10-days 99% VAR = 2.33 x Rs. 10.1981 lakhs

Question14: DISCUSS Various Sources of Risk.

Answer14: Various Sources of Risk are:

Risk arises from different sources, depending on the type of investment being considered, as well as the circumstances and the industry in which the organization is operating. Some of the sources of risk are as follows

1. Project-specific Risk- Risks which are related to a particular project and affects the project's cash flows, it Includes completion of the project in scheduled time, error of estimation in resources and allocation, estimation of cash flows etc. For example, a nuclear power project of a power generation company has different risks than hydel projects.

2. Company specific risk- Risk which arise due to company specific factors like downgrading of credit rating, changes in key managerial persons, cases for violation of Intellectual Property Rights (IPR) and other laws and regulations, dispute with workers etc. All these factors affect the cash flows of an entity and access to funds for capital investments. For example, two banks have different exposure to default risk.

3. Industry-specific risk-These are the risks which effects the whole industry in which the company operates. The risks include regulatory restrictions on industry, changes in technologies etc. For example, regulatory restriction imposed on leather and breweries industries.

4. Market risk - The risk which arise due to market related conditions like entry of substitute, changes in demand conditions, availability and access to resources etc. For example, a thermal

power project gets affected if the coal mines are unable to supply coal requirements of a thermal power company etc.

5. Competition risk- These are risks related with competition in the market in which a company operates. These risks are risk of entry of rival, product dynamism and change in taste and preference of consumers etc.

6. Risk due to Economic conditions-These are the risks which are related with macro-economic conditions like changes monetary policies by central banks, changes in fiscal policies like introduction of new taxes and chess, inflation, changes in GDP, changes in savings and net disposable income etc.

7. International risk-These are risks which are related with conditions which are caused by global economic conditions like restriction oln free trade, restrictions on market access, recessions, bilateral agreements, political and geographical conditions etc. For example, restriction on outsourcing of jobs to overseas market

Question15: STATE the disadvantages of the Certainty Equivalent Method. EXPLAIN its differences with Risk Adjusted discount rate.

Answer15: Disadvantages of Certainty Equivalent Method

1. There is no Statistical or Mathematical model available to estimate certainty Equivalent. Assumption of risk being subjective, it varies on the perception of the risk by the management because of bias and individual opinions Involved.

2. There is no objective or mathematical method to estimate certainty equivalents. Certainty Equivalent is subjective and vary as per each individual's estimate.

3. Certainty equivalents are decided by the management based on their perception of risk. However, the risk perception of the shareholders who are the money lenders for the project is ignored. Hence it is not used often in corporate decision making.

Risk-adjusted Discount Rate Vs. Certainty-Equivalent

Certainty Equivalent Method is superior to Risk Adjusted Discount Rate Method as it does not assume that risk increases with time at constant rate. Each year's Certainty Equivalent Coefficient is based on level of risk impacting its cash flow. Despite its soundness, it is not preferable like Risk Adjusted Discount Rate Method it is difficult to specify a series of certainty equivalent coefficient but simple to adjust discount rates.

QUESTION 16:- Probabilities for net cash flow for 3 years of a project of Ganesh Ltd are as follow:

Year 1		**Year 2**		**Year 3**	
Cash flow (Rs)	**Probability**	**Cash flow (Rs)**	**Probability**	**Cash flow (Rs)**	**Probability**
2,000	0.1	2,000	0.2	2,000	0.3
4,000	0.2	4,000	0.3	4,000	0.4
6,000	0.3	6,000	0.4	6,000	0.6
8, 000	0.4	8,000	0.1	8,000	0.1

Calculate the expected net cash flow and the present value of unexpected cash flow, using 10 percent discount rate. Initial investment is Rs.1,000

Answer16:-

Year 1			**Year 2**			**Year 3**		
Cash	**Probabili**	**Excepte**	**Cash**	**Probability**	**Excep**	**Cash**	**Probabil**	**Excepte**

flow (Rs)	ty	d Value (Rs)	flow (Rs)		ted Value (Rs)	flow (Rs)	ity	d Value (Rs)
2,000	0.1	200	2,000	0.2	400	2000	0.3	600
4,000	0.2	800	4,000	0.3	1200	4000	0.4	1600
6,000	0.3	1,800	6,000	0.4	2400	6000	0.2	1200
8,000	0.4	3,200	8,000	0.1	800	8000	0.1	800
ENCF		6,000			4,800			4,200

The present value of the expected value of cash flow at 10 percent discount rate has been determined as follows

Present value of cash flow

$= \frac{ENCF_1}{(1+k)^1} + \frac{ENC_2}{(1+k)^2} + \frac{ENC_3}{(1+k)^3}$

$= \frac{6000}{(1.1)^1} + \frac{4800}{(1.1)^2} + \frac{4200}{(1.1)^3}$

= (6000×0.909) + (4800×0.826) + (4200+0.751) = 12,573

Expected net present value = present value of cash flow – initial investment

=Rs 12,573 – Rs.10, 000 = Rs. 2,573

Question17:- Calculate variance and standard deviation on the basis of following information:

Possible event	Project A		Project B	
	Cash flow (Rs.)	Probability	Cash flow (Rs.)	Probability
A	80,000	0.10	2,40,000	0.10
B	1,00,000	0.20	2,00,000	0.15

C	**1,20,000**	**0.40**	**1,60,000**	**0.50**
D	**1,40,000**	**0.20**	**1,20,000**	**0.15**
E	**1,60,000**	**0.10**	**80,000**	**0.10**

Answer17:- calculation of expected value for project A and B

Project A				**Project B**		
Possible event	**Net cash flow (Rs.)**	**probability**	**Expected value**	**Cash flow (Rs.)**	**Probability**	**Expected value (Rs.)**
A	80,000	0.10	8000	2,40,000	0.10	24,000
B	1,00,000	0.20	20,000	2,00,000	0.15	30,000
C	1,20,000	0.40	48,000	1,60,000	0.50	80,000
D	1,40,000	0.20	28,000	1,20,000	0.15	18,000
E	1,60,000	0.10	16,000	80,000	0.10	8,000
ENCF			1,20,000			1,60,000

Project A

Variance (02)= (80,000-1,20,000)2 x(0.1) + (1,00,000-1,20,000)2×(0.2) + (1,20,000-1,20,000)2 x (0.4)+(1,40,000-1,20,000)2x(0.2)+(1,60,000-1,20,000)2x(0.1)=

16,00,00,000+8,00,00,000+0+8,00,00,000+ 16,00,00,000 = 48,00,00,000

Standard Deviation (σ) =21,908.90 $\sqrt{Variance\ (\sigma^2}$ $\sqrt{48,00,00,000}$

Project B

Variance(02)= (2,40,000-1,60,000)2 x(0.1) + (2,00,000-1,60,000)2 x(0.15) + (1,60,000-1,60,000)2 x(0.5)+(1,20,000-1,60,000)2×(0.15) + (80,000-1,60,000)2 × (0.1) = 64,00,00,000+24,00,00,000+0+24,00,00,000+64,00,00,000 = 1,76,00,00,000

Standard Deviation (σ) = $\sqrt{1,76,00,00,000} = 41,952.35$

Question18:- A&R Ltd. has undertaken a project which has an initial investment of Rs. 2,000 lakhs in plant & machinery and Rs.800 lakhs for working capital. The plant & machinery would have a salvage value of Rs. 474.61 lakhs at the end of the fifth year. The plant & machinery would depreciate at the rate of 25% p.a. on WDV method. The other details of the project for the five-year period are as follows:

Sales	10,00,000 units p.a.
Selling price per unit	Rs. 5000
Variable cost	50% of selling cost
Fixed overheads (excluding depreciation)	Rs.300 lakh p.a.
Corporate tax rate	35%
Rate of interest on bank loan	12%
After tax required rate of return	15%

Required:

Calculate net present value (NPV) of the project and determine the viability of project

(i) Determine the sensitivity of project's NPV under each of the following conditions:

(a) Decrease in selling price by 10%;

(b) Increase in cost of plant and machinery by 10%

PV factor	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
12%	0.892	0.797	0.711	0.635	0.567
15%	0.869	0.756	0.657	0.571	0.497

	Year-1	Year-2	Year-3	Year-4	Year-5
Sales volume	10	10	10	10	10

(Qty.in lakh)					
Contribution per unit (RS.) (Selling price- variable cost)	250	250	250	250	250
Total contribution(Rs.in lakh)	2500	2500	2500	2500	2500
Less: fixed overheads (Rs.in lakh)	300	300	300	300	300
PBDT	2200	2200	2200	2200	2200
Less: depreciation (Rs. In lakh) (working note-1)	500	375	281.25	210.94	158.20
PBT	1700	1825	1918.75	1989.75	2041.80
Less: Tax@ 35%	595	638.75	671.56	696.17	714.63
PAT	1105	1186.25	1247.19	1292.89	1327.17
Add: deprecation	500	375	281.25	210.94	158.20
Add: salvage value of plant & machinery	-	-	-	-	474.61
Add: working capital	-	-	-	-	800
Net cash inflow	1605	1561.25	1528.44	1503.83	2759.98
P.V factor @15%	0.869	0.756	0.657	0.571	0.497
P.V of cash inflows	1394.74	1180.31	1004.18	858.68	1371.71

Net present value = P.V of cash inflows – P.V of cash outflows

=Rs. (1394.74 + 1180.31 + 1004.18 + 858.68 + 1371.71) - (Rs.2000 + Rs.800)

=Rs. 3009.62 lakh

The NPV of the project is positive, hence, the project is viable.

Working note:

	Year-1	**Year-2**	**Year-3**	**Year-4**	**Year-5**
Opening balance	2000	1500	1125	843.75	632.81
Deprecation @25%	500	375	281.25	210.94	158.20
Closing WDV	1500	1125	843.75	632.81	474.61

Determination of sensitivity of NPV w.r.t

(a) Decrease in selling price by 10%

	Year-1	**Year-2**	**Year-3**	**Year-4**	**Year-5**
Sale volume (Qty.in lakh)	10	10	10	10	10
New selling price	450	450	450	450	450
Variable cost	250	250	250	250	250
Contribution per unit (Rs.) (selling price – variable cost)	200	200	200	200	200

Total contribution (Rs. In lakh)	2000	2000	2000	2000	2000
Less: fixed overheads (Rs. In lakh)	300	300	300	300	300
PBDT	1700	1700	1700	1700	1700
Less: depreciation (Rs. In lakh) (working note-1)	500	375	281.25	210.94	158.20
PBT	1200	1325	1418.75	1489.06	1541.80
Less: tax @35%	420	463.75	496.56	521.17	539.63
PAT	780	861.25	922.19	967.89	1002.17
Add: deprecation	500	375	281.25	210.94	158.20
Add: salvage value of plant & machinery	-	-	-	-	474.61
Add: working capital	-	-	-	-	800
Net cash inflow	1280	1236.25	1203.44	1178.83	2434.98
P.V factor @15%	0.869	0.756	0.657	0.571	0.497
P.V of cash inflows	1112.32	934.61	790.66	673.11	1210.18

NPV = Rs. (1,112.32 + 934.61 +790.66 + 673.11 + 1210.18) – (Rs. 2000 + Rs. 800)

= Rs. 4720.88 – Rs. 2,800 =1920.88 lakh

10% reduction in selling price reduce the NPV by 36.18% (3009.62 -1920.88/3009.62

(b) Increase in project cost by 10%

	Year-1	**Year-2**	**Year-3**	**Year-4**	**Year-5**
PBDT	2200	2200	2200	2200	2200
Less: depreciation (Rs. In lakh) (Working note-2)	550	412.5	309.37	232.03	174.03
PBT	1650	1787.50	1890.63	1967.97	2025.97
Less: tax@ 35%	577.50	625.63	661.72	688.79	709.09
PAT	1072.50	1161.87	1228.91	1279.18	1316.88
Add: depreciation	550	412.5	309.37	232.03	174.03
Add: salvage value of plant & machinery	-	-	-	-	474.61
Add: working capital	-	-	-	-	800
Net cash inflow	1622.50	1574.37	1538.28	1511.21	2765.52
P.V factor @15%	0.869	0.756	0.657	0.571	0.497
P.V of cash inflows	1409.95	1190.22	1010.65	862.90	1374.46

NPV = Rs. (1,409.95 + 1,190.22 + 1010.65 + 862.90 + 1374.46) – (Rs. 2,200 + Rs. 800)

= Rs. 5,848.18 – Rs. 3,000= 2,848.18 lakh

10% increase in project cost reduces the NPV only by 5.36% (3, 00.62)

Working note-2

	Year-1	Year-2	Year-3	Year-4	Year-5
Opening balance	2200	1650	1237.50	928.13	696.10
Deprecation @25%	550	412.5	309.97	232.03	174.03
Closing WDV	1650	1237.50	928.13	696.10	522.07

Question19: Describe the concept of 'Evaluation of Technical Analysis.

Answer19: Evaluation of Technical Analysis

Technical Analysis has several supporters as well several critics. The advocates of technical analysis offer the following interrelated argument in their favour:

(a) Under influence of crowd psychology trend persist for some time. Tools of technical analysis help in identifying these trends early and help in investment decision making.

(b) Shift in demand and supply are gradual rather than instantaneous. Technical analysis helps in detecting this shift rather early and hence provides clues to future price movements.

(c) Fundamental information about a company is observed and assimilated by the market over a period of time. Hence price movement tends to continue more or less in same direction till the information is fully assimilated in the stock price.

Detractors of technical analysis believe that it is an useless exercise; their arguments are as follows:

(a) Most technical analysts are not able to offer a convincing explanation for the tools employed by them.

(b) Empirical evidence in support of random walk hypothesis cast its shadow over the useful ness of technical analysis.

(c) By the time an uptrend and down trend may have been signaled by technical analysis It may already have taken place.

(d) Ultimately technical analysis must be self-defeating proposition. With more and more people employing it, the value of such analysis tends to decline.

In a nutshell, it may be concluded that in a rational, well ordered and efficient market, technical analysis may not work very well. However, with imperfection, inefficiency and irrationalities that characterizes the real world market, technical analysis may be helpful. If technical analysis is used in conjunction with fundamental analysis, it might be useful in providing proper guidance to investment decision makers.

Question20: Mention the various challenges to the Efficient Market Theory.

Answer 20

Following are main challenges of Efficient Market Theory:

(i) Information inadequacy-Information is neither freely available nor rapidly transmitted to all participants in the stock market. There is a calculated attempt by many companies to circulate misinformation.

(ii) Limited information processing capabilities Human Information processing capabilities are sharply limited. According to Herbert Simon every human organism lives in an environment which generates millions of new bits of information every second but the bottle necks of the perceptual apparatus does not admit more than thousand bits per seconds and possibly much less.

David Dreman maintained that under conditions of anxiety and uncertainty, with a vast interacting information grid, the market can become a giant.

(iii) Irrational Behaviour - It is generally believed that investors' rationality will ensure a close correspondence between market prices and intrinsic values. But in practice this is not true. J. M. Keynes argued that all sorts of consideration enter into the market valuation which is in no way relevant to the prospective yield. This was confirmed by L. C. Gupta who found that the market evaluation processes work haphazardly almost like a blind man firing a gun. The market seems to function largely on hit or miss tactics rather than on the basis of informed beliefs about the long term prospects of individual enterprises

(iv) Monopolistic Influence - A market is regarded as highly competitive. No single buyer or seller is supposed to have undue influence over prices. In practice, powerful institutions and big operators wield grate Influence over the market. The monopolistic power enjoyed by them diminishes the competitiveness of the market.

Question 21: Explain various Market Indicators.

Answer 21: Following are major Market Indicators:

(1) Breadth Index: It is an index that covers all securities traded. It is computed by dividing the net advances or declines in the market by the number of issues traded. The breadth index either supports or contradicts the movement of the Dow Jones Averages. If It supports the movement of the Dow Jones Averages, this is considered sign of technical strength and if it does not support the averages, it is a sign of technical weakness I.e. a sign that the market will move in a direction opposite to the Dow Jones Averages. The breadth Index is an addition to the Dow Theory and the movement of the Dow Jones Averages.

(ii) Volume of Transactions: The volume of shares traded in the market provides useful clues on how the market would behave in the near future. A rising index/price with increasing volume would signal buy behavior because the situation reflects an unsatisfied demand in **the market.** Similarly, a falling market with increasing volume signals a bear market and the prices would be expected to fall further. A rising market with decreasing volume indicates a bull market while a

falling market with dwindling volume indicates a bear market. Thus, the volume concept is best used with another market indicator, such as the Dow Theory.

(iii) Confidence Index: It is supposed to reveal how willing the investors are to take a chance in the market. It is the ratio of high-grade bond yields to low-grade bond yields. It is used by market analysts as a method of trading or timing the purchase and sale of stock, and also, as a forecasting device to determine the turning points of the market. A rising confidence index is expected to precede a rising stock market, and a fall in the index is expected to precede a drop in stock prices. A fall in the confidence index represents the fact that low-grade bond yields are rising faster or falling more slowly than high grade yields. The confidence index is usually, but not always a leading indicator of the market. Therefore, it should be used in conjunction with other market indicators,

(iv) Relative Strength Analysis: The relative strength concept suggests that the prices of some securities rise relatively faster in a bull market or decline more slowly in a bear market than other securities i.e. some securities exhibit relative strength, Investors will earn higher returns by investing in securities which have demonstrated relative strength in the past because the relative strength of a security tends to remain undiminished over time.

Relative strength can be measured in several ways. Calculating rates of return and classifying those securities with historically high average returns as securities with high relative strength is one of them. Even ratios like security relative to its industry and security relative to the entire market can also be used to detect relative strength in a security or an industry.

(v) Odd-Lot Theory: This theory is a contrary opinion theory. It assumes that the average person is usually. Wrong and that a wise course of action is to pursue strategies contrary to popular opinion. The odd-lot theory is used primarily to predict tops in bull markets, but also to predict reversals in individual securities.

Question22:- EXPLAIN briefly the Dow Jones Theory.

Answer22:- The Dow Theory is one of the oldest and most famous technical theories. It was originated by Charles Dow, the founder of Dow Jones Company in late nineteenth century. It is a helpful tool for determining the relative strength of the stock market. It can also be used as a barometer of business.

The Dow Theory is based upon the movements of two indices, constructed by Charles Dow, Dow Jones Industrial Average (DJIA) and Dow Jones Transportation Average (DJTA). These averages reflect the aggregate Impact of all kinds of information on the market. The movements of the market are divided into three classifications, all going at the same time; the primary movement, the secondary movement, and the daily fluctuations. The primary movement is the main trend of the market, which lasts from one year to 36 months or langer. This trend is commonly called bear or bull market. The secondary movement of the market is shorter in duration than the primary movement, and is opposite in direction. It lasts from two weeks to a month or more. The daily fluctuations are the narrow movements from day-to-day. These fluctuations are not part of the Dow Theory interpretation of the stock market. However, daily movements must be carefully studied, along with primary and secondary movements, as they go to make up the longer movement in the market.

Thus, the Dow Theory's purpose is to determine where the market is and where is it going, although not how far or high. The theory, in practice, states that if the cyclical swings of the stock market averages are successively higher and the successive lows are higher, then the market trend is up and a bullish market exists. Contrarily, if the successive highs and successive lows are lower, then the direction of the market is down and a bearish market exists.

Charles Dow proposed that the primary uptrend would have three moves up, the first one being caused by accumulation of shares by the far-sighted, knowledgeable investors, the second move would be caused by the arrival of the first reports of good earnings by corporations, and the last move up would be caused by widespread report of financial well-being of corporations. The third stage would also see rampant speculation in the market. Towards the end of the third stage, the far-sighted investors, realizing that the high earnings levels may not be sustained, would start selling, starting the first move down of a downtrend,

and as the non-sustainability of high earnings is confirmed, the second move down would be initiated and then the third move down would result from distress selling in the market.

Question23 The closing value of Sensex for the month of October, 2007 is given below:

Date closing	Sensex value
1.10.07	2800
3.10.07	2780
4.10.07	2795
5.10.07	2830
8.10.07	2760
9.10.07	2790
10.10.07	2880
11.10.07	2960
12.10.07	2990
15.10.07	3200
16.10.07	3300
17.10.07	3450
19.10.07	3360
22.10.07	3290
23.10.07	3360
24.10.07	3340
25.10.07	3290
29.10.07	3240
30.10.07	3140
31.10.07	3260

With the help of above data evaluate the weak form of efficient market hypothesis by applying the run test at 5% and 10% level of significance.

Following value can be used:

Value of t at 5% is 2.101 at 18 degrees of freedom Value of t at 10% is 1.734 at 18 degrees of freedom

Date closing	Sensex value	Sign of price charge
1.10.07	2800	
3.10.07	2780	-
4.10.07	2795	+
5.10.07	2830	+
8.10.07	2760	-
9.10.07	2790	+
10.10.07	2880	+
11.10.07	2960	+
12.10.07	2990	+
15.10.07	3200	+
16.10.07	3300	+
17.10.07	3450	+
19.10.07	3360	-
22.10.07	3290	-
23.10.07	3360	+
24.10.07	3340	-
25.10.07	3290	-
29.10.07	3240	-
30.10.07	3140	-
31.10.07	3260	+

Total sign of price changes (r) = 8 No

Of positive changes = n_1 = 11 No. of

Negative changes = n_2 = 8

$$\mu = \frac{2n_1n_2}{n_1+n_2} + 1$$

$$\mu = \frac{2\times11\times8}{11+8} + 1 = \frac{176}{19} + 1 = 10.26$$

$$\sigma\hat{} = \sqrt{\frac{2n_1 n_2 (2n_1n_2 - n_1 - n_2)}{n_1+n_2{}^2 (n_1+n_2 - 1)}}$$

$$\hat{\sigma_r} = \sqrt{\frac{(2\times11\times8)(2\times11\times8-11-8)}{(11+8)^2\,(11+8-1)}} = \sqrt{\frac{176\times157}{(19)^2(18)}} = \sqrt{4.252} = 2.06$$

Since too few runs in the case would indicate that the movement of prices is not random. We employ a two-tailed test the randomness of prices.

Test at 5% level of significance at 18 degrees of freedom using t- table The

lower limit

$= \mu - t \times \sigma_r\hat{} = 10.26 - 2.101 \times 2.06 = 5.932$

Upper limit

$= \mu - t \times \sigma_r\hat{} = 10.26 + 2.101 * 2.06 = 14.588$

At 10% level of significance at 18 degrees of freedom

Lower limit = 10.26 - 1.734 * 2.06 = 6.688

Upper limit

$= 10.26 + 1.734 \times 2.06 = 13.832$

As seen r lies between these limits. Hence, the market exhibits weak form of efficiency.

*For a sample of size n, the t distribution will have n-1 degrees of freedom.

Question24: DESCRIBE the factors affecting Industry Analysis.

Answer 24: The following factors may particularly be kept in mind while assessing the factors relating to an industry.

(i) Product Life-Cycle: An industry usually exhibits high profitability in the initial and growth stages, medium but steady profitability in the maturity stage and a sharp decline in profitability in the last stage of growth.

(ii) Demand Supply Gap: Excess supply reduces the profitability of the industry because of the decline in the unit price realization, while insufficient supply tends to improve the profitability because of higher unit price realization.

(iii) Barriers to Entry: Any industry with high profitability would attract fresh investments. The potential entrants to the industry, however, face different types of barriers to entry. Some of these barriers are Innate to the product and the technology of production, while other barriers are created by existing firms in the industry.

(iv) Government Attitude: The attitude of the government towards an industry is a crucial determinant of its prospects.

(v) State of Competition in the Industry: Factors to be noted are- firms with leadership capability and the nature of competition amongst them in foreign and domestic market, type of products manufactured viz. homogeneous or highly differentiated, demand prospects through classification viz customer wise/area- wise, changes in demand patterns in the long/immediate/ short run, type of industry the firm is placed viz. growth, cyclical, defensive or decline.

(vi) Cost Conditions and Profitability: The price of a share depends on its return, which in turn depends on profitability of the firm. Profitability depends on the state of competition in the industry, cost control measures adopted by its units and growth in demand for its products.

(vi) Technology and Research: They play a vital role in the growth and survival of a particular industry. Technology is subject to change very fast leading to obsolescence. Industries which update themselves have a competitive advantage over others in terms of quality, price etc

Question25: Explain the factors affecting economic analysis. (RTP May 20)

Answer25: Some of the factors affecting economic analysis are discussed as under:

(1) Growth Rates of National Income and Related Measures: For most purposes, what is important is the difference between the nominal growth rate quoted by GDP and the 'real' growth after taking inflation into account. The estimated growth rate of the economy would be a pointer to the prospects for the industrial sector, and therefore to the returns investors can expect from investment in shares.

(ii) Growth Rates of Industrial Sector: This can be further broken down into growth rates of various industries or groups of industries if required. The growth rates in various industries are estimated based on the estimated demand for its products.

(iii) Inflation: Inflation is measured in terms of either wholesale prices (the Wholesale Price Index or WPI) or retail prices (Consumer Price Index or CPI). The demand in some industries, particularly the consumer products industries, is significantly influenced by the inflation rate. Therefore, firms in these industries make continuous assessment about inflation rates likely to prevail in the near future so as to fine-tune their pricing, distribution and promotion policies to the anticipated impact of inflation on demand for their products.

(iv) Monsoon: Because of the strong forward and backward linkages, monsoon is of great concern to investors in the stock market too.

Question26: Describe briefly on which principles Technical Analysis is based.

Answer26: Technical analysis is based on the following three principals:

(1) The Market Discounts Everything: Although many experts criticize technical analysis because it only considers price movements and ignores fundamental factors but the Efficient Market Hypothesis (discussed later in detail) contradicts it according to which a company's share price already reflects everything that has or could affect a company and it includes fundamental factors. So, technical analysts generally have the view that a company's share price includes everything including the fundamentals of a company.

(2) Price Moves in Trends: Technical analysts believe that prices move in trends. In other words, a stock price is more likely to continue a past trend than move in a different direction.

(3) History Tends to Repeat Itself: Technical analysts believe that history tends to repeat itself. Technical analysis uses chart patterns to analyze subsequent market movements to understand trends. While many form of technical analysis have been used for many years, they are still considered to be significant because they illustrate patterns in price movements that often repeat themselves.

Question27: Mr. X is of the opinion that market has recently shown the Weak Form of Market Efficiency. In order to test the validity of his impression he has collected the following data relating to the movement of the SENSEX for the last 20 days.

Days	Open	High	Low	Close
1	33470.94	33513.79	33438.03	33453.99
2	33453.64	33478.11	33427.82	33434.83
3	33414.06	33440.29	33397.65	33431.93
4	33434.94	33446.18	33377.78	33383.41
5	33372.92	33380.27	33352.12	33370.93
6	33375.85	33389.49	33331.42	33340.75
7	33340.89	33340.89	33310.95	33330.98
8	33326.84	33340.91	33306.17	33335.08

9	33307.16	33328.22	33296.43	33301.97
10	33307.16	33318.60	33254.28	33259.03
11	33260.04	33228.85	33241.66	33251.53
12	33255.92	33289.46	33249.46	33285.89
13	33288.86	33535.67	33255.98	33329.28
14	33335.00	33346.21	33276.72	33284.17
15	33293.83	33310.86	33278.54	33298.78
16	33300.02	33337.79	33300.02	33325.38
17	33323.36	33356.34	33322.44	33329.95
18	33322.81	33345.98	33317.44	33319.67
19	33317.51	33321.18	33294.19	33302.32
20	33290.86	33324.96	33279.62	33319.61

You are required:

To test the Weak Form of Market Efficiency using Auto-Correlation test, taking time lag of 10 days.

Answer27

Period 1	Closing Prices	Change	Period 2	Closing Prices	Change
1	33453.99		11	33251.53	
2	33434.83	-19.16	12	33285.89	34.36
3	33431.93	-2.90	13	33329.28	43.39
4	33383.41	-48.52	14	33284.17	-45.11
5	33370.93	-12.48	15	33298.78	14.61
6	33340.75	-30.18	16	33325.38	26.6
7	33330.98	-9.77	17	33329.95	4.57
8	33335.08	4.1	18	33319.67	-10.28
9	33301.97	-33.11	19	33302.32	-17.35

10	33259.03	-42.94	20	33319.61	17.29

X	Y	X2	Y2	XY
19.16	34.36	367.11	1180.61	658.34
2.90	43.39	8.41	1882.69	125.83
48.52	45.11	2354.19	2034.91	2188.74
12.48	14.61	155.75	213.45	182.33
30.18	26.6	910.83	707.56	802.79
9.77	4.57	95.45	20.88	44.65
4.1	10.28	16.81	105.68	44.65
33.11	17.35	1096.27	301.02	574,46
42.94	17.29	1843.84	298.94	742.43
ΣX=-194.96	ΣY = 68.08	ΣX^2 = 6848.66	ΣY^2 = 6745.74	ΣXY = 164.68
X = 21.66	Y = 7.56			

$b = \frac{EXY - nXY}{\sum X^2 - n(x)2} = \frac{164.68 - 9\,(-21.66)(7.56)}{6848.66 - 9\,(-21.66)} = 0.624$

a = Y - bX = 7.56 - 0.624(- 21.66) = 21.08

$r^2 = \frac{a\,\sum Y + b\,\sum XY - n\,(Y)^2}{\sum Y^2 - n(Y)^2} = \frac{21.08\,(68.08) + 0.624(164.68) - 9\left(7.56^2\right)}{6745.74 - 9(7.56)^2}$

r^2 = 0. 164

r=0.405

There is moderate degree of correlation between the returns of two periods hence it can be concluded that the market does not show the weak form of efficiency.

Question28: Explain the various indicators that can be used to assess the performance of an economy

Answer28: Techniques Used in Economic Analysis Economic analysis is used to forecast national income with its various components that have a bearing on the concerned industry and the company in particular. Gross National Product (GNP) is used to measure national Income as it reflects the growth rate in economic activities and has been regarded as a forecasting tool analyzing the overall economy along with its various components during a particular period.

Some of the techniques used for economic analysis are:

(a) Anticipatory Surveys: They help investors to form an opinion about the future state of the economy. It Incorporates expert opinion on construction activities, expenditure on plant and machinery, levels of Inventory all having a definite bearing on economic activities. Also future spending habits of consumers are taken into account.

In spite of valuable inputs available through this method, it has certain drawbacks:

(1) Survey results do not guarantee that intentions surveyed would materialize.

(II) They are not regarded as forecasts per se, as there can be a consensus approach by the investor for exercising his opinion.

Continuous monitoring of this practice is called for to make this technique popular.

(b) Barometer/Indicator Approach: Various indicators are used to find out how the economy shall perform in the future. The indicators have been classified as under:

(i) Leading Indicators: They lead the economic activity in terms of their outcome. They relate to the time series data of the variables that reach high/low points in advance of economic activity.

Roughly Coincidental Indicators: They reach their peaks and troughs at approximately the same in the economy.

(ii) Lagging Indicators: They are time series data of variables that lag behind in their consequences vis-a- vis the economy. They reach their turning points after the economy has reached its own already.

All these approaches suggest direction of change in the aggregate economic activity but nothing about its magnitude. The various measures obtained form such indicators may give conflicting signals about the future direction of the economy. To avoid this limitation, use of diffusion/composite index is suggested whereby combining several indicators into one index to measure the strength/weaknesses in the movement of a particular set of indicators. Computation of diffusion indices is no doubt difficult notwithstanding the fact it does not eliminate irregular movements.

Money supply in the economy also affects investment decisions. Rate of change in money supply in the economy affects GNP, corporate profits, Interest rates and stock prices. Increase in money supply fuels inflation. As investment in stocks is considered as a hedge against inflation, stock prices go up during inflationary period.

(c) Economic Model Building Approach: In this approach, a precise and clear relationship between dependent and independent variables is determined. GNP model building or sectoral analysis is used in practice through the use of national accounting framework. The steps used are as follows:

(i) Hypothesize total economic demand by measuring total income (GNP) based on political stability, rate of inflation, changes in economic levels.

(II) Forecasting the GNP by estimating levels of various components viz. consumption expenditure, gross private domestic investment, government purchases of goods/services, net exports.

(iii) After forecasting individual components of GNP, add them up to obtain the forecasted GNP.

(iv) Comparison is made of total GNP thus arrived at with that from an independent agency for the forecast of GNP and then the overall forecast is tested for consistency. This is carried out

for ensuring that both the total forecast and the component wise forecast fit together in a reasonable manner.

Question29: capital structure of sun Ltd , as at 31.3.2003 was as under:

	Rs. In lakhs
Equity share capital	80
8% preference share capital	40
12% Debentures	64
Reserve	32

Sun Ltd., earns a profit of Rs. 32 lakhs annually on an average before deduction of income-tax, which works out to 35%, and interest on debentures. Sun Ltd. has been regularly paying equity dividend of 8%.

Normal return on equity shares of companies similarly placed is 9.6% provided:

(i) Profit after tax covers fixed interest and fixed dividends at least 3 times.

(ii) Capital gearing ratio is 0.75.

(iii) Yield on share is calculated at 50% of profits distributed and at 5% on undistributed profits.
ANALYZE the value per equity share of the company assuming the risk premium as:

(A) 1% for every one time of difference for Interest and Fixed Dividend Coverage.

(B) 2% for every one time of difference for Capital Gearing Ratio.

Answer29

(i) Calculation of profit after tax (PAT)

	Rs.
Profit before interest and tax (PBIT)	32,00,000
Less: debentures interest (Rs. 64,00,000 × 12/100)	7,68,000
Profit before tax (PBT)	24,32,000
Less: Tax @ 35%	8,51,200
Profit after tax (PAT)	15,80,800
Less: preference dividend	
(Rs.40,000 × 8/100 3,20,000	
Equity dividend (Rs. 80,00,000 ×8/100) 6,40,000	9,60,000
Retained earnings (undistributed profit)	6,20,000

Calculation of interest and fixed dividend coverage

$$= \frac{\text{PAT+Debentures interest}}{\text{Debentures interest + preference dividend}}$$

$$= \frac{15,80,000+7,68,000}{7,68,000+3,20,000} = \frac{23,48,800}{10,88,000} = 2.16\ times$$

(ii) Calculation of capital gearing ratio

$$\text{Capital gearing ratio} = \frac{\text{fixed interest bearing funds}}{\text{Equity shareholder}^{F}\text{ S funds}}$$

$$= \frac{\text{Preference share capital+Debenures}}{\text{equity share capital+ Reserves}} = \frac{40,00,000+64,00,000}{80,00,000+32,00,000} = \frac{1,04,00,000}{1,12,00,000} = 0.93$$

(iii) Calculation of yield on equity shares:

Yield on equity shares is calculated at 50% of profit distributed and 5% undistributed profit

(Rs.)

50% on distributed profits (Rs. 6,40,000 ×50/100	3,20,000

5% on undistributed profits (Rs. 6,20,800×5/100)	31,040
Yield on equity shares	3,51,040

Yield on equity shares % $= \frac{\text{Yield on shares}}{\text{equity share capital}} \times 100$

$= \frac{3,51,040}{80,00,000} \times 100 = 4.39\% \; or \; 4.388\%$

Calculation of Expected Yield on Equity shares

(A) Interest and fixed dividend coverage of Sun Ltd. is 2.16 times, but the industry average is 3 times. Therefore, risk premium is added to Sun Ltd. Shares @ 1% for every 1 time of difference. Hence, Risk Premium = 3 - 2.16(196) = 0.84(196) = 0.84%

(B) Capital Gearing ratio of Sun Ltd. is 0.93 but the industry average is 0.75 times. Therefore, risk premium is added to Sun Ltd. shares @ 2% for every 1 time of difference. Hence, Risk Premium = (0.75 - 0.93) (2%) = 0.18(2%) = 0.36%

	(%)
Normal return expected	9.60
Add: risk premium for low interest and fixed dividend coverage	0.84
Add: risk premium for high interest gearing ratio	0.36
	10.80

Value of equity shares

$= \frac{\text{actual yeild}}{\text{expected yield}} \times \text{paid up value of share} = \frac{4.39}{10.80} \times = \text{Rs. } 40.65$

Question 30: A Ltd. has issued convertible bonds, which carries a coupon rate of 14%. Each bond is convertible into 20 equity shares of the company A Ltd. The prevailing interest rate for similar credit rating bond is 8%. The convertible bond has 5 years maturity. It is redeemable at par at Rs. 100. The relevant present value table is as follows.

Present value	t1	t2	t3	t4	t5
PVIFO.14,T	0.877	0.769	0.675	0.592	0.519
PVIFO.08,T	0.926	0.857	0.794	0.735	0.681

You are required to estimate: (Calculations be made up to 3 decimal places)

(i) Current market price of the bond, assuming it being equal to its fundamental value,

(ii) Minimum market price of equity share at which bond holder should exercise conversion option; and duration of the bond.

Answer30:

(i) Current market price of bond

Time	CF	PVIF 8% PV (CF)	PV (CF)
1	14	0.926	12.964
2	14	0.857	11.998
3	14	0.794	11.116
4	14	0.735	10.290
5	14	0.681	77.634
		PV (CF) i.e. PO=	124.002

Rs. 124.00

(ii) Minimum market price of equity shares at which bondholder should exercise conversion option:

$\frac{124.00}{20.00} = Rs. 6.20$

(iii) Duration of the bond

Year	Cash flow	P.V. @ 8%		Proportion of bond value	Proportion of bond value × time (year)
1	14	0.926	12.964	0.105	0.105
2	14	0.857	11.998	0.097	0.194
3	14	0.794	11.116	0.089	0.267
4	14	0.735	10.290	0.083	0.332
5	114	0.681	77.634	0.626	3.130
			124.002	1.000	4.028

Question 31: ABC Ltd. issued 9%, 5 year bonds of Rs. 1,000/-each having a maturity of 3 years. The present rate of interest is 12% for one year tenure. It is expected that Forward rate of interest for one year tenure is going to fall by 75 basis points and further by 50 basis points for every next year in further for the same tenure. This bond has a beta value of 1.02 and is more popular in the market due to less credit risk.

Calculate

(i) Intrinsic value of bond

(ii) Expected price of bond in the market

Answer 31

(i) Intrinsic value of Bond

PV of Interest + PV of Maturity Value of Bond

Forward rate of interests

1st Year 12%

2nd Year 11.25%

3rd Year 10.75%

PV of interest = $\frac{Rs.90}{(1+0.12)} + \frac{Rs.90}{(1+0.12)(1+0.1125)} + \frac{Rs.90}{(1+0.12)(1+0.1125)+(1+0.1075)} = Rs.217.81$

PV of maturity value of bond = $\frac{Rs.1000}{(1+0.12)(1+0.1125)+(1+0.1075)}$ = Rs.724.67

Intrinsic value of bond = Rs. 217.81+ Rs.724.67= Rs.942.48

(ii) Expected price = intrinsic value × beta value = Rs. 948.48 × 1.02 = Rs. 961.33

Question 32: 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 Rs.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) Advise the percentage amount to bond portfolio manager to be invested in bonds B and C to immunise the portfolio and he has been asked to keep 45% of the portfolio money in Bond A.

(iii) Evaluate whether the portfolio is still immunized if after the portfolio has been formulated, an interest rate change occurs, increasing the yield to 11%. The new duration of bonds are: Bond A = 7.15 Years, Bond R = 6nz Years and Bond c = 437 years.

(iv) Advise 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 value	**t1**	**t2**	**t3**	**t4**	**t5**
PVIFO.09,t	0.917	0.842	0.772	0.708	0.650
Present value	**t6**	**t7**	**t8**	**t9**	**t10**
PVIFO.09,t	0.596	0.547	0.502	0.460	0.4224

Answer32: calculation of bond duration

Bond A

Year	**Cash flow**	**P.V @ 9%**		**Proportion of bond value**	**Proportion of bond value × 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	45.46	0.437	4.370
			106.40	1.000	6.862

Duration of the bond is 6.862 years or 6.86 year

Bond B

Year	Cash flow	P.V @ 9%		Proportion of bond value	Proportion of bond value × 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	55.772	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	P.V @ 9%		Proportion of bond value	Proportion of bond value × 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

Period required to be immunized 6.000 Year

Less: Period covered from Bond A 3.087 Year

To be immunized from B and C 2.913 Year

Let proportion of investment in Bond B and C is b and c respectively then b + c = 0.55(1)

5.883b+4.242c = 2.913 (2)

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.

(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 year

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.

Period required to be immunized 6.0000 Year

Less: Period covered from Bond A 3.2175 Year

To be immunized from B and C 2.7825 Year

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 b = 0.2466

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.

Question32: Eager Ltd. has a market capitalization of Rs. 1,500 crores and the current market price of its share is Rs. 1,500. It made a PAT of Rs. 200 crores and the Board is considering a proposal to buy back 20% of the shares at a premium of 10% to the current market price. It plans to fund this through a 16% bank loan. The company's corporate tax rate is 30%. Calculate the post buy back Earnings Per Share (EPS).

Answer33

Existing No. of equity shares = $\frac{\text{Rs.1500 crore}}{\text{Rs.1,500}} = 1 \text{ crore}$

No. of shares to be bought back = 1 Crore x 0.20 = 20 Lakh

Price at which share to be bought back = Rs. 1,500 + 10% of Rs. 1.5 = Rs 1,650 Amount required for Buyback of Shares Rs. 1.65 * 20 Lakh = Rs. 330 Crore Amount of Loan @ 16% = Rs. 330 Crore

Statement showing post buyback EPS

Profit before tax (Rs. 200 crore/ 0.70	Rs. 285.7143 crore
Less: interest on loan (Rs. 330 crore ×16%	Rs. 52.8000 crore
Profit before tax	Rs. 232.9143 crore
Tax	Rs.69.8743crore
Profit after tax (PAT)	Rs. 163.0400 crore
No. of shares post buyback	80 lakh
EPS (post buyback) (Rs. 163.0400 crore/ 80.00 lakh	Rs. 203.80

Question 33: the data given below to a convertible bond:

Face value	**Rs. 250**

Coupon rate	**12%**
No. of shares per bond	**20**
Market price of share	**Rs. 12**
Straight value of bond	**Rs.235**
Market price of convertible bond	**Rs.265**

Calculate:

(i) Stock value of bond.

(ii) The percentage of downside risk**.**

(iii) The conversion premium

(iv) The conversion parity price of the stock.

Answer33:

(i) Calculation of stock value or conversion value of bond

12 × 20 = Rs.240

(ii) Calculation of percentage of the downside risk

$\frac{\text{Rs.265}-\text{Rs.235}}{\text{Rs.235}} = 0.1277 \text{ or } 12.77\%$ Or $\frac{\text{Rs.265}-\text{Rs.235}}{\text{Rs.265}} = 0.1132 \text{ Or } 11.32\%$

The ratio gives the percentage price decline experienced by the bond if the stock becomes worthless

(iii) Calculation of conversion premium

$$\frac{\text{market price} - \text{conversion premium}}{\text{conversion value}} \times 100$$

$$\frac{Rs.265 - Rs.240}{Rs.240} \times 100 = 10.42\%$$

(iv) Calculation of conversion parity price

$$\frac{\text{Bond price}}{\text{No. of shares on conversion}}$$

$$\frac{Rs.265}{20} = Rs.13.25$$

This indicates that if the price of shares rises to Rs. 13.25 from Rs. 12 the investor will neither gain nor lose on buying the bond and exercising it. Observe that Rs. 1.25 (Rs. 13.25 Rs. 12.00) is 10.42% of Rs. 12, the Conversion Premium.

Question34: ABC Ltd. wants to issue 9% Bonds redeemable in 5 years at its face value of Rs. 1,000 each. The annual spot yield curve for similar risk class of Bond is as follows:

Year	Interest rate
1	12%
2	11.62%
3	11.33%
4	11.06%
5	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 up to 4 decimal points and value in Rs. up to 2 decimal points. (MTP 8 Marks April (21)

Answer 8

(1) 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%**

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

Rs. 90 x 0.8929+ Rs. 90 x 0.8026+ Rs. 90 x 0.7247+ Rs. 90 x 0.6573 + Rs. 90 x 0.5988

= Rs * 0.8 * 0.36 + Rs * 0.72 * 0.23 + Rs * 0.65 * 0.22 + Rs * 0.59 * 0.16 + Rs * 0.53 * 0.89 = Rs. 330.86

PV of Maturity Value of Bond Rs. 1000/ (1 + 0.108) deg = Rs. 1000 * 0.59BB =Rs.598.BO

Intrinsic value of Bond Rs. 330.86 Rs. 598.80 Rs. 929.66 Expected

Price Intrinsic Value x Beta Value

= Rs. 929.66 x 1.10 Rs. 1,022.63 100 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.

Question35: Mr. A is thinking of buying shares at Rs. 500 each having face value of Rs. 100. He is expecting a bonus at the ratio of 1:5 during the fourth year. Annual expected dividend is 20% and the same rate is expected to be maintained on the expanded capital base. He intends to

sell the shares at the end of seventh year at an expected price of Rs. 900 each. Incidental expenses for purchase and sale of shares are estimated to be 5% of the market price. He expects a minimum return of 12% per annum.

Recommend whether Mr. A should buy the shares? If so, what maximum price should he pay for each share? Assume no tax on dividend income and capital gain.

Answer35:

Year	Divd . /sale	PVF (12%)	PV(Rs.)
1	Rs. 20/-	0.893	17.86
2	Rs. 20/-	0.797	15.94
3	Rs. 20/-	0.712	14.24
4	Rs. 24/-	0.636	15.26
5	Rs. 24/-	0.567	13.61
6	Rs. 24/-	0.507	12.17
7	Rs. 24/-	0.452	10.85
7	Rs. 1026/- (900× 1.2×0.95)	0.452	463.75
	Less: cost of shares (Rs. 500 × 1.05)		Rs. 525.00
	Net gain		Rs.38.68

Since Mr. A is gaining Rs. 38.68 per share, he should buy the share,

Maximum price Mr. A should be ready to pay is Rs. 563.68 which will include incidental expenses. So the maximum price should be Rs. 563.68 × 100 / 105 = Rs 536.84

Question36: The following data is available for a bond:

Face Value:- Rs.1,000

Coupon Rate:- 11%

Years to Maturity:- 6

Redemption Value:- Rs. 1,000

Yield to Maturity:- 15%

(Round-off your answers to 3 decimals)

Calculate the following in respect of the bond:

(i) Current Market Price.

(ii) Duration of the Bond.

(iii) Volatility of the Bond.

(iv) Expected market price if increase in required yield is by 100 basis points..

(v) Expected market price if decrease in required yield is by 75 basis points.

Answer36:

(i) Calculation of market price

$$\text{TM}= \frac{\text{Coupon interest}+\left(\frac{\text{discount or premium}}{\text{years left}}\right)}{\frac{\text{face value}+\text{market value}}{2}}$$

Discount or premium - YTM is more than coupon rate, market price is less than Face Value i.e. at discount.

Let x be the market price

$$0.15 = \frac{110+[\frac{1,000-x}{6}]}{\frac{1000+x}{2}}$$

X= Rs. 834.48

Alternatively, it can also be calculated using Tabular Method.

(ii) Duration

Year	Cash flow	P.V. 15%		Proportion of bond value	Proportion of bond value ×time (years)
1	110	.870	95.70	0.113	0.113
2	110	.756	83.16	0.098	0.196
3	110	.658	72.38	0.085	0.255
4	110	.572	62.92	0.074	0.296
5	110	.497	54.67	0.064	0.320
6	1110	.432	479.52	0.565	3.39
			848.35	1.000	4.570

Duration of the Bond is 4.570 years

(iii) Volatility

4.570 Volatility of the bond Duration= = 3.974 (1+yields) 1.15

(iv) The expected market price if increase in required yield is by 100 basis points. = Rs. 834.48 X 1.00 (3.974/100) = Rs 33.162

Hence expected market price is Rs. 834.48-Rs 33.162 = Rs 801.318 Alternatively, this can also be calculated as follows:

Rs 848.35 × 100(3.794/100) = 33.71

Question37: Mr. Tamarind intends to invest in equity shares of a company the value of which depends upon various parameters as mentioned below:

Factor	**Beta**	**Expected value in %**	**Actual value in %**
GNP	1.20	7.70	7.70
Inflation	1.75	5.50	7.00
Interest rate	1.30	7.75	9.00
Stock market index	1.70	10.00	12.00
Industrial production	1.00	7.00	7.50

The risk free rate of interest be 9.25%

Calculate the return of the share as per Arbitrage Theory.

Answer37: return of stock under APT

Factor	Actual value in %	Expected value	Difference	beta	Diff.× Beta
GNP	7.70	7.70	0.00	1.20	0.00
Inflation	7.00	5.50	1.50	1.75	2.63
Interest rate	9.00	7.75	1.25	1.30	1.63
Stock index	12.00	10.00	2.00	1.70	3.40
Ind. Production	7.50	7.00	0.50	1.00	0.50
					8.16
Risk free rate in %					9.25
Return as per APT					17.41

Question38: Mr. Tempest has the following of four shares:

Name	Beta	Investment Rs. lac.
Oxy Rin Ltd.	0.45	0.80
Boxed Ltd.	0.35	1.50
Square Ltd.	1.15	2.25
Ellipse	1.85	4.50

The risk-free rate of return is 7% and the market rate of return is 14%.

CALCULATE

(i) Portfolio return.

(ii) Calculate the portfolio Beta

Answer38:

Market risk premium (A) = 14% - 7% =7%

Share	Beta	Risk premium (beta× A)%	Risk free return %	Return %	Return RS
Oxy Rin Ltd	0.45	3.15	7	10.15	8,120
Boxed Ltd	0.35	2.45	7	9.45	14,175
Square Ltd	1.15	8.05	7	15.05	33,863
Ellipse Ltd.	1.85	12.95	7	19.95	89,775
Total return					1,45,933

Total investment Rs. 9, 05,000

(i) Portfolio return = $\frac{1,45,933}{9,05,000} \times 100 = 16.13\%$

(ii) Portfolio beta

Portfolio return = risk free rate + Risk premium × β =16.13%

7% + 7 β = 16.13%

β = 1.30

Alternative approach

First, we shall compute portfolio beta using the weighted average method as follow:

Beta $_p$ = $0.45\times \frac{0.80}{9.05} + 0.35 \times \frac{1.50}{9.05} + 1.15 \times \frac{2.25}{9.05} + 1.85 \times \frac{4.50}{9.05}$

=0.45 × 0.0884 + 0.35 × 0.1657 + 1.15 X 0.2486 + 1.85 × 4972 = 0.0398+ 0.058+ 0.2859 + 0.9198 = 1.3035

Accordingly,

(i) Portfolio Return using CAPM formula will be as follows: $R_P = R_F + Beta_P (R_M - R_F)$

= 796 + 1.3035(14% - 796) = 796 + 1.3035(7%) = 7% +9.1245% = 16.1245%

(II) Portfolio Beta

As calculated above 1.3035

Question39: on January 1, 2013 an investor have a portfolio of 5 shares as given below:

Security	Price	No. of shares	Beta
A	349.30	5,000	1.15
B	480.50	7,000	0.40
C	593.52	8,000	0.90
D	734.70	10,000	0.95
E	824.85	2,000	0.85

The cost of capital to the investor is 10.5% per annum. You are required to calculate:

(i) The beta of his portfolio.

(ii) The theoretical value of the NIFTY futures for February 2013.

(iii) The number of contracts of NIFTY the investor needs to sell to get a full hedge until February for his portfolio if the current value of NIFTY is 5900 and NIFTY futures have a minimum trade lot requirement of 200 units. Assume that the futures are trading at their fair value.

(iv) The number of future contracts the investor should trade if he desires to reduce the beta of his portfolios to0.6.

No. of days in a year be treated as 365.

Given: In (1.105) = 0.0998 and e(0.015858) 1.01598

Answer39:

(i) Calculation for portfolio beta

Security	**Price of stock**	**No of shares**	**Value**	**Weightage Wi**	**Beta Bi**	**Weighted beta**
A	349.30	5000	17,46,500	0.093	1.15	0.107
B	480.50	7000	33,63,500	0.178	0.40	0.071
C	593.52	8000	47,48,160	0.252	0.90	0.227
D	734.70	10,000	73,47,000	0.390	0.95	0.370
E	824.85	2,000	16,49,700	0.087	0.85	0.074
			1,88,54,860			0.849

Portfolio beta = 0.849

(ii) Calculation of Theoretical value of future contract

Cost of Capital = 10.5% p.a. Accordingly, the Continuously Compounded Rate of Interest In (1.105) = 0.0998

For February 2013 contract, t= 58/365 0.1589 Further F= Se

F= Rs 5, 900$e^{(0.0998)(0.1589)}$

F= Rs. 5,900$e^{0.015858}$

F = Rs, 5, 900 × 1.01598 = Rs, 5, 994, 28

Alternatively, it can also be taken as follows:

= Rs. 5900$e^{0.105 \times 58 / 365}$

= Rs. 5900$e^{0.01668}$

= Rs. 5900 x 1.01682 Rs. 5,999.24

(iii) When total portfolio is to be hedged

$$\frac{\text{value of spot postion requiring hedging}}{\text{value of future contract}} \times \text{portfolio beta}$$

$\frac{1,88,54,860}{5994.28 \times 200} \times 0.849 = 13.35$ contract say 13 or 14 contract

(iv) When total portfolio beta is to be reduced to 0.6:

Number of contract to be sold = $\frac{P\ (\beta_p - \beta_p}{F}$

= $\frac{1,88,54,860\ (\ 0849 - 0.600)}{5994.28 \times 200}$ = 3.92 Contract say 4 contract

Question40: Mr. Abhishek is interested in investing Rs. 2,00,000 for which he is considering following three alternatives:

(i) Invest Rs. 2,00,000 in Mutual Fund X (MFX)

(ii) Invest Rs. 2,00,000 in Mutual Fund Y (MFY)

(iii) Invest Rs. 1,20,000 in Mutual Fund X (MFX) and Rs. 80,000 in Mutual Fund Y (MFY)

Average annual return earned by MFX and MFY is 15% and 14% respectively. Risk free rate of return is 10% and market rate of return is 12%.

Covariance of returns of MFX, MFY and market portfolio Mix are as follow:

	MFX	**MFY**	**Mix**
MFX	4.800	4.300	3.370
MFY	4.300	4.250	2.800
Mix	3.370	2.800	3.100

You are required to calculate:

(i) Variance of return from MFX, MFY and market return,

(ii) Portfolio return, beta, portfolio variance and portfolio standard deviation,

(iii) Expected return, systematic risk and unsystematic risk; and

(iv) Sharpe ratio, Treynor ratio and Alpha of MFX, MFY and Portfolio Mix.

Answer40:

(i) Variance of return

$$\text{Cor}_{i,j=}\frac{\text{Cor }(i,j)}{\sigma_i \sigma_j}$$

According for MFX

$$1 = \frac{\text{Cov (X, X)}}{\sigma_X \sigma_X}$$

$\sigma^2_{X=4.800}$

According, For MFY

$$\mathbf{1} = \frac{\text{Cov(Y, Y)}}{\sigma_Y \sigma_Y}$$

$\sigma^2_{Y=4.250}$

According to market return

$$1 = \frac{Cov(M, M)}{\sigma_M \sigma_M}$$

$\sigma^2_{M=3.100}$

(ii) Portfolio return, beta, variance and standard deviation

Weight of MFX in portfolio = $\frac{1,20,000}{2,00,000} = 0.60$

Weight of MFY in portfolio = $\frac{80,000}{2,00,000} = 0.40$

Accordingly, portfolio return

0.60 × 15% + 0.40 × 14% = 14.60 %

Beta of each end

$$\beta = \frac{\text{Cov (fund, market)}}{\text{variance of market}}$$

$$\beta_X = \frac{3.370}{3.100} = 1.087$$

$\beta_Y = \frac{2.800}{3.100}$ = 0.903

Portfolio beta

0.60 × 1.087 + 0.40 × 0.903 = 1.013

Portfolio variance

σ^2_{xy} = W2 $_X$ σ^2_X + W^2_y σ^2_y + 2w_x W_y Cov $_{x,y}$

$=(0.60)^2(4.800) + (0.40)^2(4.250) + 2(0.60)(0.40)(4.300) = 4.472$

Or Portfolio standard Deviation

$\sigma_{xy} = \sqrt{4.47}$ = 2.115

(ii) expected return, systemic and unsystemic risk of portfolio return =10%+ 1.0134 (12% -10%) = 12.17%

MFX Return = 10% +1.087 (12% - 10%) = 12.17%

MFY Return =10% + 0.903 (12% - 10%) = 11.81%

Systemic Risk = $\beta^2\sigma^2$

Accordingly,

Systematic Risk of MFX = (1.087)2 x 3.10 = 3.663 Systematic Risk of MFY = (0.903)2 x 3.10 = 2.528

Systematic Risk of Portfolio = (1.013)2 x 3.10 3.181 Unsystematic Risk

Total Risk-Systematic Risk Accordingly,

Unsystematic Risk of MFX=4.80-3.663 1.137 Unsystematic Risk of MFY = 4.250-2.5281.722

Unsystematic Risk of Portfolio = 4.472-3.181 = 1.291

(iv) Sharpe and Treynor Ratios and Alpha

Sharpe ratio

MFX= $\frac{15\%-10\%}{\sqrt{4.800}} = 2.282$

MFY=$\frac{14\%-10\%}{\sqrt{4.250}} = 1.94$

Portfolio = $\frac{14.6\%-10\%}{2.115} = 2.175$

Treynor ratio

MFX = $\frac{15\%-10\%}{1.087} = 4.60$

MFY=$\frac{14\%-10\%}{0.903} = 4.43$

Portfolio= $\frac{14.6\%-10\%}{1.0134} = 4.54$

Alpha

MFX = 15% - 12.17% = 2.83%

MFY = 14% - 11.81% = 2.19%

Portfolio = 14.6% - 12.03% = 2.57%

Question41: Mr. Kapoor owns a portfolio with the following characteristics:

	Security X	**Security Y**	**Risk free security**
Factor 1 sensitivity	0.75	1.50	0
Factor 2 sensitivity	0.60	1.10	0
Expected return	15%	20%	10%

It is assumed that security returns are generated by a two factor model.

(i) Analyze the sensitivity of Mr. Kapoor's portfolio to the two factors if he has Rs. 1,00,000 to invest and sells short Rs. 50,000 of security Y and purchases Rs. 1,50,000 of security X.

(ii) Evaluate the sensitivity of the portfolio to the two factors if Mr. Kapoor borrows Rs. 1,00,000 at the risk free rate and invests the amount he borrows along with the original amount of Rs. 1,00,000 in security X and Y in the same proportion as described in part (i).

(iii) Determine the expected return premium of factor 2? (MTP 12 Marks March 21, PYP 8 Marks Nov '18, Old & New SM)

Answer 41

(1) Mr. Kapoor's position in the two securities is +1.50 in security X and -0.5 in security Y. Hence the portfolio sensitivities to the two factors:-

b prop. 1=1.50 x 0.75+ (-0.50 x 1.50) = 0.375

b prop. 21.50 x 0.60 + (-0.50 x 1.10) = 0.35

(ii) Mr. Kapoor's current position:

Security XRs. 3,00,000/Rs. 1,00,000 = 3

Security Y-Rs. 1,00,000/Rs. 1,00,000=-1

Risk free asset -Rs. 100000/Rs. 100000 = -1

b prop. 1 3.0 x 0.75 + (-1 x 1.50) + (-1 x 0) = 0.75

b prop 2 = 3 * 0.6 + (- 1 × 1.1) + (- 1 × 0) = 0.7

(iii) Expected Return = Risk Free Rate of Return + Risk Premium Let 11 and 12 are the Value Factor 1 and Factor 2 respectively. Accordingly

15 = 10 + 0.75 λ1 + 0.60λ2

$20 = 10 + 1.50\lambda 1 + 1.10\lambda 2$

On solving equation, the value of $\lambda 1$ and $\lambda 2$ comes 6.67 and 0 respectively.

Accordingly, the expected risk premium for the factor 2 shall be Zero and whatever be the risk the same shall be on account of factor 1.

Alternatively, the risk premium of Securities X & Y can be calculated as follows: Security X

Total Return 15% Risk Free Return 10% Risk Premium 5% Security Y

Total Return 20% Risk Free Return 10% Risk Premium = 10%

Question42: EXPLAIN securitization in India.

Answer42: It is the Citi Bank who pioneered the concept of securitization in India by bundling of auto loans in securitized Instruments. Thereafter many organizations securitized their receivables. Although started with securitization of auto loans it moved to other types of receivables such as sales tax deferrals, aircraft receivable etc.

In order to encourage securitization, the Government has come out with Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002, to tackle menace of Non- Performing Assets (NPAs) without approaching to Court. With growing sophistication of financial products in Indian Capital Market, securitization has occupied an important place. As mentioned above, though, initially started with auto loan receivables, it has become an important source of funding for micro finance companies and NBFCs and even now a days commercial mortgage backed securities are also emerging. The Important highlight of the scenario of securitization in Indian Market is that it is dominated by a few players e.g. ICICI Bank, HDFC Bank, NHB etc. As per a report of CRISIL, securitization transactions in India scored to the highest level of approximately Rs. 70000 crores, in Financial Year 2016. (Business Line, 15th June, 2016) In order to further enhance the investor base in

securitized debts, SEBI allowed FPIs to invest in securitized debt of unlisted companies up to a certain limit.

Question43: Discuss briefly the primary participants in the process of Securitization.

Answer43: Primary Participants are main parties to this process. The primary participants in the process of securitization are as follows:

(1) Originator: It is the initiator of deal or can be termed as securitizer. It is an entity which sells the assets lying in its books and receives the funds generated through the sale of such assets. The originator transfers both legal as well as beneficial interest to the Special Purpose Vehicle (discussed later).

(ii) Special Purpose Vehicle: Also, called SPV is created for the purpose of executing the deal. Since issuer originator transfers all rights in assets to SPV, it holds the legal title of these assets. It is created especially for the purpose of securitization only and normally could be in form of a company, a firm, a society or a trust.

The main objective of creating SPV to remove the asset from the Balance Sheet of Originator. Since, SPV makes an upfront payment to the originator, it holds the key position in the overall process of securitization. Further, it also issues the securities (called Asset Based Securities or Mortgage Based Securities) to the Investors.

(iii) The Investors: Investors are the buyers of securitized papers which may be an individual, an institutional investor such as mutual funds, provident funds, insurance companies, mutual funds, Financial Institutions etc.

Since, they acquire a participating in the total pool of assets/receivable, they receive their money back in the form of interest and principal as per the terms agree.

Question44: Explain the pricing of the securitized Instruments.

OR

Describe the concept of 'Stripped Securities.

Answer44: Pricing of the securitized Instruments

Pricing of securitized instruments in an important aspect of securitization. While pricing the instruments, it is Important that it should be acceptable to both originators as well as to the investors. On the same basis pricing of securities can be divided into following two categories:

From Originator's Angle

From originator's point of view, the instruments can be priced at a rate at which originator has to incur an outflow and if that outflow can be amortized over a period of time by investing the amount raised through securitization.

From Investor's Angle

From an investor's angle security price can be determined by discounting best estimate of expected future cash flows using rate of yield to maturity of a security of comparable security with respect to credit quality and average life of the securities. This yield can also be estimated by referring the yield curve available for marketable securities, though some adjustments is needed on account of spread points, because of credit quality of the securitized instruments.

OR

Stripped Securities

Stripped Securities are created by dividing the cash flows associated with underlying securities into two or more new securities. Those two securities are as follows:

(1) Interest Only (IO) Securities

(II) Principle Only (PO) Securities

As each investor receives a combination of principal and interest, it can be stripped into two portion of Interest and Principle. Accordingly, the holder of 10 securities receives only interest while PO security holder receives only principal. Being highly volatile in nature these securities are less preferred by investors.

In case yield to maturity in market rises, PO price tends to fall as borrower prefers to postpone the payment on cheaper loans. Whereas if interest rate in market falls, the borrower tends to repay the loans as they prefer to borrow fresh at lower rate of interest.

In contrast, value of 10's securities increases when interest rate goes up in the market as more interest is calculated on borrowings. However, when interest rate due to prepayments of principals, 10's tends to fall. Thus, from the above, it is clear that it is mainly perception of investors that determines the prices of 10s and POS.

Question45: Describe the problems faced in the growth of Securitization of instruments especially in Indian context.

OR

"Though in recent period of time the concept of securitisation has become popular in India as a source of Off Balance Sheet source of financing but its level of growth is still far behind" Explain.

OR

State the main problems faced in Securitization in India?

Answer45: Following are main problems faced in growth of Securitization of instruments especially in indian context:

Stamp Duty

Stamp Duty is one of the obstacles in India. Under Transfer of Property Act, 1882, a mortgage debt stamp duty which even goes upto 12% in some states of India and this impeded the

growth of securitization in India. It should be noted that since pass through certificate does not evidence any debt only able to receivable, they are exempted from stamp duty.

Moreover, in India, recognizing the special nature of securitized instruments in some states has reduced the stamp duty on them.

Taxation

Taxation is another area of concern in India. In the absence of any specific provision relating to securitized instruments in Income Tax Act experts' opinion differ a lot. Some are of opinion that in SPV as a trustee is liable to be taxed in a representative capacity then other are of view that instead of SPV, Investors will be taxed on their share of income. Clarity is also required on the issues of capital gain implications on passing payments to the investors.

Accounting

Accounting and reporting of securitized assets in the books of originator is another area of concern. Although securitization is slated to an off-balance sheet instrument but in true sense receivables are removed from originator's balance sheet. Problem arises especially when assets are transferred without recourse.

Lack of standardization

Every originator follows own format for documentation and administration have lack of standardization is another obstacle in growth of securitization,

Inadequate Debt Market

Lack of existence of a well-developed debt market in India is another obstacle that hinders the growth of secondary market of securitized or asset backed securities.

Ineffective Foreclosure laws

For last many years there are efforts are going on for effective foreclosure but still foreclosure laws are not supportive to lending institutions and this makes securitized instruments especially

mortgaged backed securities less attractive as lenders face difficulty in transfer of property in event of default by the borrower.

Question46: Distinguish between Pass Through Certificates (PTCs) and Pay Through Securities (PTSs).

Answer46: The difference between Pass Through Certificates (PTCs) and Pay Through Securities (PTSs) are as follows:

Pass Through Certificates (PTCs)	**Pay Through Securities (PTSs)**
The originator (seller of the assets) transfers the entire receipt of cash in form of interest or principal repayment from the assets sold. Thus, the investors carry proportional beneficial interest in the asset held in the trust by SPV. PTCs are self-amortizing assets because it is a direct route of prepayment of principal which is proportionately distributed among the securities holders. Due to these characteristics on completion of securitization by the final payment of assets, all the securities are terminated simultaneously. Further it also carries uncertainty in repayment of principal.	In PTS, SPV debt securities backed by the assets and hence it can restructure different tranches from varying maturities of receivables. This structure permits desynchronization of servicing of securities issued from cash flow generating from the asset which are used as collateral. Accordingly these subject to less uncertainty regarding the pre-payment of principal.
Since whatever cash is received is simply passed through there are hardly any surplus fund is left for short term investment.	This structure permits the SPV to reinvest surplus funds for short term as per their requirement.

Question47: Describe various securitization instruments.

Answer47:

Securitization Instruments

On the basis of different maturity characteristics, the securitized instruments can be divided into following three categories:

(i) Pass Through Certificates (PTCS): As the title suggests originator (seller of the assets) transfers the entire receipt of cash in form of interest or principal repayment from the assets sold. Thus, these securities represent direct claim of the investors on all the assets that has been securitized through SPV.

Since all cash flows are transferred the investors carry proportional beneficial interest in the asset held in the trust by SPV.

It should be noted that since it is a direct route any prepayment of principal is also proportionately distributed among the securities holders. Further, due to these characteristics on completion of securitization by the final payment of assets, all the securities are terminated simultaneously.

Skewness of cash flows occurs in early stage if principals are repaid before the scheduled time.

(ii) Pay Through Security (PTS): As mentioned earlier, since, in PTCs all cash flows are passed to the performance of the securitized assets. To overcome this limitation and limitation to single mature there is another structure i.e. PTS.

In contrast to PTC in PTS, SPV debt securities backed by the assets and hence it can restructure different tranches from varying maturities of receivables.

In other words, this structure permits desynchronization of servicing of securities issued from cash flow generating from the asset. Further, this structure also permits the SPV to reinvest surplus funds for short term as per their requirement.

Since, in Pass Through, all cash flow immediately in PTS in case of early retirement of receivables plus cash can be used for short term yield. This structure also provides the freedom to issue several debt trances with varying maturities.

(iii) Stripped Securities: Stripped Securities are created by dividing the cash flows associated with underlying securities into two or more new securities. Those two securities are as follows:

(1) Interest Only (10) Securities

(i) Principle Only (PO) Securities

As each investor receives a combination of principal and interest, it can be stripped into two portions of Interest and Principle. Accordingly, the holder of 10 securities receives only interest while PO security holder receives only principal. Being highly volatile in nature these securities are less preferred by investors. In case yield to maturity in market rises, PO price tends to fall as borrower prefers to postpone the payment on cheaper loans. Whereas if interest rate in market falls, the borrower tends to repay the loans as they prefer to borrow fresh at lower rate of interest. In contrast, value of 10's securities Increases when interest rate goes up in the market as more interest is calculated on borrowings. However, when interest rate due to prepayments of principals, IO's tends to fall. Thus, from the above, it is clear that it is mainly perception of investors that determines the prices of 10s and POS.

Question48: Different participants are required for the success of the securitisation process. Discuss their roles. (MTP 4 Marks March (23)

Answer48: Role of various participants in the process of securitization is as follows:

1. Originator: It is the initiator of deal or can be termed as securitizer. It is an entity which sells the assets lying in its books and receives the funds generated through the sale of suchassets.

II. Special Purpose Vehicle: Since issuer originator transfers all rights in assets to SPV, it holds the legal title of these assets. It is created especially for the purpose of securitization only and normally could be in form of a company, a firm, a society or a trust.

III. The Investors: Investors are the buyers of securitized papers which may be an individual, an institutional Investor such as mutual funds, provident funds, insurance companies, mutual funds, Financial Institutions etc.

IV. Obligors: The amount due from the obligor is transferred to SPV and hence they form the basis of securitization process and their credit standing is of paramount importance in the whole process,

V. Rating Agency: Since the securitization is based on the pools of assets rather than the originators, the assets have to be assessed in terms of its credit quality and credit support available.

VI. Receiving and Paying agent (RPA): Also, called Servicer or Administrator, it collects the payment due from obligor(s) and passes it to SPV. It also follow up with defaulting borrower and if required initiate appropriate legal action against them. Generally, an originator or its affiliates acts as servicer.

VII. Agent or Trustee: Trustees are appointed to oversee that all parties to the deal perform in the true spirit of terms of agreement. Normally, it takes care of interest of investors who acquires the securities.

VIII. Credit Enhancer: Since investors in securitized instruments are directly exposed to performance of the underlying and sometime may have limited or no recourse to the originator, they seek additional comfort in the form of credit enhancement.

IX. Structurer: It brings together the originator, investors, credit enhancers and other parties to the deal of securitization. Normally, these are investment bankers also called arranger of the deal. It ensures that deal meets all legal, regulatory, accounting and tax laws requirements.

Question49: Cinderella Mutual Fund has the following assets in Scheme Rudolf at the close of business on 31st March, 2014.

Company	No. of Shares	Market Price Per Share
Nairobi Ltd.	25000	Rs. 20
Dakar Ltd.	35000	Rs. 300
Senegal Ltd.	29000	Rs. 380
Cairo Ltd.	40000	Rs. 500

The total number of units of Scheme Rudol are 10 lacs. The Scheme Rudolf has accrued expenses of Rs. 2,50,000 and other liabilities of Rs. 2,00,000.

CALCULATE the NAV per unit of the Scheme Rudolf.

Answer49:

Shares	No. of shares	Price	Amount (Rs.)
Nairobi Ltd.	25,000	20.00	5,00,000
Dakar Ltd.	35,000	300.00	1,05,00,000
Senegal Ltd.	29,000	380.00	1,10,20,000
Cairo Ltd.	40,000	500.00	2,00,00,000

			4,20,20,000
Less: accrued expenses			2,50,000
Other liabilities			2,00,000
Total value			4,15,70,000
No. of units			10,00,000
NAV per unit (4,15,70,000/10,00,000)			41.57

Question50: Orange purchased 200 units of Oxygen Mutual Fund at Rs. 45 per unit on 31st December, 2009. In 2010, he received Rs. 1.00 as dividend per unit and a capital gains distribution of Rs. 2 per unit. Required:

(i) Calculate the return for the period of one year assuming that the NAV as on 31st December 2010 was Rs. 48 per unit.

(ii) Calculate the return for the period of one year assuming that the NAV as on 31 st December 2010 was Rs. 48 per unit and all dividends and capital gains distributions have been reinvested at an average price of Rs. 46.00 per unit. Ignore taxation. (MTP 8 Marks March '19)

Answer50:

(i) Returns for the year

(All changes on a Per-Unit Basis)

Change in Price: Rs. 48-Rs.45 Rs.

Rs. 1.00

Capital gains distribution Rs. 2.00

Total reward Rs. 6.00

Holding period reward $\frac{Rs.6.00}{Rs.45} \times 100 = 13.33\%$

(ii) When all dividends and capital gains distributions are re-invested into additional units of the fund @ (Rs. 46/unit)

Dividend + Capital Gains per unit Rs. 1.00 Rs. 2.00 Rs. 3.00

Total received from 200 units Rs. 3.00 x 200 Rs. 600/-

Additional Units Acquired Rs. 600/Rs. 46 13.04 Units.

(iii) Total No. of Units = 200 units + 13.04 units = 213.04 units. Value of 213.04 units held at the end of the year

213.04 units x Rs.48 Rs. 10225.92

(iv) Price Paid for 200 Units at the beginning of the year 200 units x Rs. 45 = Rs. 9000.00 Holding Period Reward Rs. (10225.92-9000.00) = Rs.1225.92

(v) Holding period reward $\frac{Rs.1225.92}{Rs.9000} \times 100 = 13.62\%$

Question51: Explain the different methods for evaluating the performance of a mutual fund.

Answer51: Methods for Evaluating the Performance

1. Sharpe Ratio

The excess return earned over the risk free return on portfolio to the portfolio's total risk measured by the standard deviation. This formula uses the volatility of portfolio return. The Sharpe ratio is often used to rank the risk-adjusted performance of various portfolios over the same time. The higher a Sharpe ratio, the better aportfolio's returns havebeen relative to the amount of investment risk the investor has taken.

$$\mathbf{S = \frac{Return\ of\ portfolio - Return\ risk\ free\ investment}{Standard\ deviation\ of\ portfolio}}$$

2. Treynor Ratio

This ratio is similar to the Sharpe Ratio except it uses Beta of portfolio instead of standard deviation. Treynor ratio evaluates the performance of a portfolio based on the systematic risk of a fund. Treynor ratio is based on the premise that unsystematic or specific risk can be diversified and hence, only incorporates the systematic risk (beta) to gauge the portfolio's performance

$$\mathbf{T = \frac{Return\ of\ portfolio - Return\ risk\ free\ investment}{Beta\ of\ portfolio}}$$

3. Jensen's Alpha

The comparison of actual return of the fund with the benchmark portfolio of the same risk. Normally, for the comparison of portfolios of mutual funds this ratio is applied and compared with market return. It shows the comparative risk and reward from the said portfolio. Alpha is the excess of actual return compared with expected return.

Question52: The idea of Quant Fund is stock-picking free from human intervention. Discuss.

Answer52: The given statement is true to a certain extent in reference to Mutual Funds where the concept of Quant Fund is becoming popular day by day.

Quant Fund follows a data-driven approach for stock selection or investment decisions based on a pre- determined rules or parameters using statistics or mathematics based models.

Contrary to an active fund Manager who selects the quantum and timing of investments ie, entry or exit, this fund completely rely on an automated programme for making decision for quantum of investment as well as its timings.

It does not mean that there is no human intervention at all, the Fund Manager usually foc uses on the robustness of the Models in use and also monitors their performance or some modification is required.

Sometime a Quant Fund manager is confused with Index Fund Manager but it is not so as the Index Fund Manager may entirely hands off the investment decision purely based on Index, while Quant Fund Manager often designs and monitors models that throw up the choices.

The main advantage of Quant Fund is that it eliminates the human biasness and subjectivity. Further using model based approach also ensures consistency in strategy across the market conditions.

Also since the Quant Fund normally follows passive strategy, the exposure ratio tends to be lower.

Since Quant Fund uses highly sophisticated strategies investors who well understand Stock Valuation methods, different stock picking styles, the market sentiments and derivatives etc. should invest in the same. Further since Quant Fund are tested on the basis of historical data and past trends though cannot altogether be ignore but also cannot be used blindly as good indicators.

Thus, overall it can be said that whether it is human or a machine it is not easy to beat the market.

Question53: Following information pertains to a regular income scheme:

Particulars	**Crores**
Listed shares at Cost (ex-dividend)	20
Cash in hand	1.23
Bonds and debentures at cost	4.3
Of these, bonds not listed and quoted	1

Other fixed interest securities at cost	4.5
Dividend accrued	0.8
Amount payable on shares	6.32
Number of units (Rs. 10 face value)	20 lacs
Current realizable value of fixed income securities of face value of Rs.100	106.5
The listed shares were purchased when Index was	1,000
Present index is	2,300
Value of listed bonds and debentures at NAV date	8

There has been a diminution of 20% in unlisted bonds and debentures. Other fixed interest securities are at cost.

CALCUALTE the NAV of on per unit basis.

Answer53:

Particulars	**Adjusted Values Rs. Crores**
Equity Shares	46.00
Cash in hand	1.23
Bonds and debentures not listed	0.80
Bonds and debentures listed	8.00
Dividends accrued	0.80
Fixed income securities	4.50
Sub total assets (A)	61.33
Less: liabilities	
Amount payable on shares	6.32
Expenditure accrued	0.72
Sub total liabilities (B)	7.07
Net Assets Value (A)-(B)	57.26
No. of units	20,00,000

Net Assets Value per unit (Rs. 54.26 crore / 20,00,000)	Rs. 271.30

Question54: EXPLAIN how to measure divergence or deviation of return of a Mutual Fund Scheme that replicates any Benchmark Index.

OR

Describe Tracking error. List the reasons for it. (PYP 4 Marks July 21)

Answer54: Tracking error can be used to measure the divergence or deviation of a fund's return from the benchmarks return it is following.

The passive fund managers closely follow or track the benchmark index. Although they design their Investment strategy on the same index but often it may not exactly replicate the index return. In such

situation, there is possibility of deviation between the returns.

The tracking error can be calculated on the basis of corresponding benchmark return vis a vis quarterly or monthly average NAVS.

Higher the tracking error higher is the risk profile of the fund. Whether the funds outperform or underperform their benchmark indices; it clearly indicates that of fund managers are not following the benchmark indices properly. In addition to the same other reason for tracking error are as follows:

- Transaction cost
- Fees charged by AMCS
- Fund expenses
- Cash holdings
- Sampling biasness

Thus, from above it can be said that to replicate the return to any benchmark index the tracking error should be near to zero.

The Tracking Error is calculated as follows:

$$\sqrt{\sum \frac{(d-\bar{d})^2}{n-1}}$$

d = Differential return

$\bar{d}$ = Average differential return

n = No. of observation

Question55: Discuss the types of Commodity Swaps.

Answer55: There are two types of commodity swaps: fixed-floating or commodity-for-interest.

(a) Fixed-Floating Swaps: They are just like the fixed-floating swaps in the interest rate swap market with the exception that both indices are commodity based indices.

General market indices in the international commodities market with which many people would be familiar include the S&P Goldman Sachs Commodities Index (S&PGSCI) and the Commodities Research Board Index (CRB). These two indices place different weights on the various commodities so they will be used according to the swap agent's requirements.

(b) Commodity-for-Interest Swaps: They are similar to the equity swap in which a total return on the commodity in question is exchanged for some money market rate (plus or minus a spread).

Question56: The equity share of VCC Ltd. is quoted at Rs. 210. A 3-month call option is available at a premium of Rs. 6 per share and a 3-month put option is available at a premium of Rs. 5 per share. Calculate the net payoffs to the option holder of a call option and a put option.

(i) The strike price in both cases is Rs. 220; and

(ii) The share price on the exercise day is Rs. 200,210,220,230,240.

Also recommend the price range at which the call and the put options may be gainfully exercised

Answer56:

Net payoff for the holder of the call option

(Rs.)					
Share price on exercise day	200	210	220	230	240
Option exercise	No	No	No	Yes	Yes
Outflow (Strike price)	Nil	Nil	Nil	220	220
Out flow (premium)	6	6	6	6	6
Total Outflow	6	6	6	226	226
Less inflow (Sales proceeds)	-	-	-	230	240
Net payoff	-6	-6	-6	4	14

Net payoff for the holder of the put option

(Rs.)					
Share price on exercise day	200	210	220	230	240

Option exercise	Yes	Yes	No	No	No
Inflow (strike price)	220	220	Nil	Nil	Nil
Less outflow (purchase price)	200	210	-	-	-
Less outflow (premium	5	5	5	5	5
Net Payoff	15	5	-5	-5	-5

The call option can be exercised gainfully for any price above Rs. 226 (Rs. 220 + Rs. 6) and put option for any price below Rs. 215 (Rs. 220 - Rs. 5).

Question57: Ram buys 10,000 shares of X Ltd. at a price of Rs. 22 per share whose beta value is 1.5 and sells 5,000 shares of A Ltd. at a price of Rs. 40 per share having a beta value of 2. He obtains a complete hedge by Nifty futures at Rs. 1,000 each. He closes out his position at the closing price of the next day when the share of X Ltd. dropped by 2%, share of A Ltd. appreciated by 3% and Nifty futures dropped by 1.5%. Interpret the overall profit/loss of Ram?

Answer57: No. of the future contract to be obtained to get a complete hedge

$$= \frac{10000 \times Rs.22 \times 1.5 - 5000 \times Rs.40 \times 2}{Rs.1000}$$

$$= \frac{\text{Rs. } 3{,}30{,}000 - \text{Rs. } 4{,}00{,}000}{\text{Rs. } 1000} = 70 \text{ contract}$$

Thus, by purchasing 70 nifty future contract to be long to be obtain a complete hedge.

= 10000 × Rs.22 – 5000 × Rs. 40 + 70 x Rs. 1,000

= Rs. 2,20,000 Rs. 2,00,000+ Rs. 70,000 = Rs. 90,000

Cash Inflow at Close Out

= 10000 x Rs. 22 * 0.98 x Rs. 40 x 1.03 + 70 x Rs. 1,000 x 0.985 = Rs. 2,15,600-Rs. 2,06,000 + Rs. 68, 950 = Rs 78,550

Gain/Loss

= Rs. 78,550-Rs. 90,000 = -Rs. 11,450 (Loss)

Question58: A company is long on 10 MT of copper @ Rs. 534 per kg (spot) and intends to remain so for the ensuing quarter. The variance of change in its spot and future prices are 16% and 36% respectively, having correlation coefficient of 0.75. The contract size of one contract is 1,000 kgs.

Required:

(i) Calculate the Optimal Hedge Ratio for perfect hedging in Future Market.

(ii) Advice the position to be taken in Future Market for perfect hedging.

(iii) Determine the number and the amount of the copper futures to achieve a perfect hedge.

Answer58:

(1) The optional hedge ratio to minimize the variance of Hedger's position is given by:

$$H = p\,\frac{\sigma S}{\sigma F}$$

OS = Standard deviation of As (Change in Spot Prices) of Standard deviation of AF (Change in Future Prices) p= coefficient of correlation between Δs and ΔF

H= Hedge Ratio

Δs = change in Spot price.

ΔF = change in Future price.

Accordingly

Standard deviation of Δs = $\sqrt{16\%}$ = 4% and

Standard deviation of Δf = $\sqrt{36\%} = 6\% \; and$

H = $0.75 \times \frac{0.04}{0.06} = 0.5$

(ii) Since the company is long position in Spot (Cash) Market it shall take Short Position in Future Market.

(iii) Since contact size of one contract is 1,000 Kg, the

No. of contract to be short = $\frac{10{,}000 \text{ kgs}}{1{,}000 \text{ kgs}} \times 0.50 = 5 \text{ contract}$

Amount = $5000 \times \text{Rs. } 534 = \text{Rs.}26{,}70{,}000$

Question59: Mr. Dayal is interested in purchasing equity shares of ABC Ltd. which are currently selling at Rs. 600 each. He expects that price of share may go upto Rs. 780 or may go down to Rs. 480 in three months. The chances of occurring such variations are 60% and 40% respectively. A call option on the shares of ABC Ltd. can be exercised at the end of three months with a strike price of Rs. 630.

(i) Advise what combination of share and option should Mr. Dayal select if he wants a perfect hedge?

(ii) Evaluate the value of option today (the risk free rate is 10% p.a.)?

(iii) Interpret the expected rate of return on the option?

Answer59:

(I) To compute perfect hedge we shall compute hedge ratio (Δ) as follow:

$\Delta = \frac{C_1 - C_2}{S_1 - S_2} = \frac{150-0}{780-480} = \frac{150}{300} = 0.5$

Mr. Dayal should purchase 0.50 share for every 1 call option.

(II) Value of Option today

If price of share comes out to be Rs.780 then value of purchased share will be:

Sale Proceeds of Investment (0.50 x Rs. 780)	Rs. 390
Loss on account of Short Position (Rs. 780 Rs. 630)	Rs. 150
	Rs. 240

If price of share comes out to be Rs. 480 then value of purchased share will be:

Sale Proceeds of Investment (0.50 x Rs. 480)	Rs. 240

Accordingly, Premium say P shall be computed as follows:

(Rs. 300-P) 1.025 = Rs. 240

P = Rs.65.85

Expected Return on the Option

(III) Expected option value = (Rs. 780 – Rs. 630) × 0.60 +Rs. 0 × 0.40 = Rs. 90

Expected rate of return = $\frac{90-65.85}{65.85} \times 100 = 36.67\%$

Question60: EXPLAIN cash settlement and physical settlement in derivative contracts and their relative advantages and disadvantages. (RTP May '19)

Answer60: The physical settlement in case of derivative contracts means that underlying assets are actually delivered on the specified delivery date. In other words, traders will have to take delivery of the shares against position taken in the derivative contract.

In case of cash settlement, the seller of the derivative contract does not deliver the underlying asset but transfers the Cash. It is similar to Index Futures where the purchaser, who wants to

settle the contract in cash, will have to pay or receive the difference between the Spot price of the contract on the settlement date and the

Futures price decided beforehand since it is impossible to effect the physical ownership of the underlying securities.

The main advantage of cash settlement in derivative contract is high liquidity because of more derivative volume in cash segment. Moreover, the underlying stocks in derivative contracts has constricted bid-ask spreads. And, trading in such stocks can be effected at lower impact cost. If the stock is liquid, the impact cost of bigger trades will be lower.

Further, an adverse move can be hedged. For example, the investors can take a covered short derivative position by selling the future while still holding the underlying security.

Also, a liquid derivative market facilitates the traders to do speculation. The speculative trading may worry the regulators but it is also true that without speculative trading, it will not be possible for the derivative market to stay liquid.

So, this leads to some arguments in favour of physical settlement in derivative contract. One advantage of physical settlement is that it is not subject to manipulation by both the parties to the derivative contract. This is so because the entire activity is monitored by the broker and the clearing exchange.

However, one main disadvantage of physical delivery is that it is almost impossible to short sell a stock In the Indian Market.

Therefore, in the end, it can be concluded that, though, physical settlement in derivative contract does curb manipulation it also affects the liquidity in the derivative segment.

Question61: An Indian exporting firm, Rohit and Bros., would be covering itself against a likely depreciation of pound sterling. The following data is given:

Receivables of Rohit and Bros: £500,000 Spot

Rate: Rs. 56.00/£

Payment date: 3-months

3 months interest rate: India: 12 percent per annum: UK: 5 per cent per annum

ADVICE what should the exporter do?

Answer61: The only thing lefts Rohit and Bros to cover the risk in the money market. The following steps are required to be taken:

(1) Borrow pound sterling for 3- months. The borrowing has to be such that at the end of three months, the amount becomes £ 500,000. Say, the amount borrowed is £ x. Therefore X [1 + 0.05 × 3/12] =500,000 or X = £493,827

(ii) Convert the borrowed sum into rupees at the spot rate. This gives: £493,827 x Rs. 56 = Rs. 27,654,312

(iii) The sum thus obtained is placed in the money market at 12 per cent to obtain at the end of 3-months: S= Rs.27,654,312 x 1 +0.12×3/12]=Rs. 28,483,941

(iv) The sum of £500,000 received from the client at the end of 3 months is used to refund the loan taken earlier.

From the calculations. It is clear that the money market operation has resulted into a net gain of Rs. 483,941 (Rs. 28,483,941-Rs. 500,000 × 56).

If pound sterling has depreciated in the meantime. The gain would be even bigger.

Question62: Following information relates to AKC Ltd. which manufactures some parts of an electronics device which are exported to USA, Japan and Europe on 90 days credit terms.

Cost and Sales information:			
	Japan	**USA**	**Europe**

Variable cost per unit	Rs.225	Rs.395	Rs.510
Export sale price per unit	Yen 650	US$10.23	Euro 11.99
Receipts from sale due in 90 days	Yen 78,00,000	US$1,02,300	Euro 95,920
Foreign exchange rate information:			
	Yen/Rs	**US$/Rs.**	**Euro/Rs**
Spot market	2.417-2.437	0.0214-0.0217	0.0177-0.0180
3 months forward	2.397-2.427	0.0213-0.0216	0.0176-0.0178
3 months spot	2.423-2.459	0.02144-0.02156	0.0177-0.0179

Advice AKC Ltd. by calculating average contribution to sales ratio whether it should hedge its foreign currency risk or not.

Answer63: If foreign exchange risk is hedged

				Total (Rs.)
Sum due	Yen 78,00,000	US$1,02,300	Euro 95,920	
Unit input price	Yen 650	US$10.23	Euro 11.99	
Unit sold	12000	10000	8000	Rs. 1,07,30,000
Variable cost per unit	Rs.225/	395	510	
Variable cost	Rs. 27,00,000	Rs. 39,50,000	Rs. 40,80,000	
Three months forward rate for selling	2.427	0.0216	0.0178	
Rupee value of receipts	Rs.32,13,844	Rs. 47,36,111	Rs. 53,88,764	Rs. 1,33,38,719

Contribution	Rs.5,13,844	Rs. 7,86,111	Rs. 13,08,764	Rs. 26,08,719
Average contribution to sale ratio				19.56%
If risk is not hedged				
Rupee value of receipt	Rs.31,72,021	Rs. 47,44,898	Rs. 53,58,659	Rs. 1,32,75,578
Total contribution				Rs. 25,45,578
Average contribution to sale ratio				19.17%

AKC Ltd. Is advised to hedge its foreign currency exchange risk.

Question64: On April 3, 2016, a Bank quotes the following:

Spot exchange Rate (US $ 1)	INR 66.2525	INR 67.5945
2 months' swap points	70	90
3 months' swap points	160	186

In a spot transaction, delivery is made after two days. Assume spot date as April 5, 2016.

Assume 1 swap point = 0.0001, Calculate:

(i) Swap points for 2 months and 15 days. (For June 20, 2016),

(ii) Foreign exchange rate for June 20, 2016, and

(iii) The annual rate of premium/discount of US$ on INR, on an average rate.

Answer 64:

(1) Swap Points for 2 months and 15 days

	Bid	Ask
Swap Points for 2 months (a)	70	90
Swap Points for 3 months (b)	160	186
Swap Points for 30 days (c) = (b) - (a)	90	96
Swap Points for 15 days (d) = (c) / 2	45	48
Swap Points for 2 months & 15 days (e) = (a) + (d)	115	138

(2) Foreign Exchange Rates for 20th June 2016

	Bid	Ask
Spot Rate (a)	66.2525	67.5945
Swap Points for 2 months & 15 days (b)	0.0115	0.0138
	66.2640	67.6083

(3) Annual Rate of Premium

	Bid	Ask
Spot Rate (a)	66.2525	67.5945
Foreign Exchange Rates for 20th June 2016 (b)	66.2640	67.6083
Premium (c)	0.0115	0.0138
Total (d\ = (a) + (b)	132.5165	135.2028
Average (d)/2	66.2583	67.6014
Premium	$\frac{0.0115}{66.2583} \times \frac{12}{2.5} \times 10 = 0.0833\%$	$\frac{0.0138}{67.2583} \times \frac{12}{2.5} \times 100 = 0.0980\%$

Question 65: Mercy is a Forex Dealer with XYZ Bank. She notices following information relating to Canadian Dollar (CAD) and German Deutschmark (DEM): Exchange rate - CAD 0.775 per DEM (Spot) CAD 0.780 per DEM (3 months)

Interest rates - DEM 7% p.a.

CAD 9% p.a.

(i) Assuming that there is no transaction cost determine does the Interest Rate Parity holds in above quotations.

(ii) If yes, then explain the steps that would be required to make an arbitrage profit if Mercy is authorized to work with CAD 1 million for the same purpose. Also determine the profit that would be made in CAD.

Answer65:

(1) For 3 months, rCAD 2.25% and rDEM 1.75%. Since the exchange rate is in CAD/ DEM term the appropriate equation for interest Rate Parity is as follows:

$$\frac{F}{S} = \frac{(1 + r_{CAD})}{(1 + r_{DEM})}$$

$$\frac{0.780}{0.775} = \frac{(1 + 0.0225)}{(1 + 0.0175)}$$

1.00645 ≠ 1.00491

Since both sides are not equal, Interest Rate Parity does not hold.

(ii) Since IRP does not hold there is an arbitrage opportunity. Interest Differential 2.25%-1.75%=0.50%

$$\text{Premium} = \frac{0.780 + 0.775}{0.775} \times 100 = 0.645\%$$

Since the interest rate differential is smaller than the premium, it will be profitable to place money in Deutschmarks the currency whose 3-months interest is lower.

The following operations are carried out:

(i) Borrow CAD 1 million at 9 per cent for 3-months;

(ii) Change this sum into DEM at the spot rate = (1,000,000/0.775) = 1,290,323

(iii) Place DM 1,290,323 in the money market for 3 months to obtain a sum of DM Principal:

1,290,323

Add: Interest @ 7% for 3 months =22,581

Total 1,312,904

(iv) Sell DEM at 3-months forward to obtain CAD (1,312,904 x 0.780) = CAD 1,024,065

(v) Refund the debt taken in CAD with the interest due on it, i.e., CAD

Principal 1,000,000

Add: Interest @9% for 3 months 22,500 Total 1,022,500

Net arbitrage gain = CAD 1,024,065-CAD 1,022,500 CAD 1,565

Question66: A multinational company is planning to set up a subsidiary company in India (where hitherto it was exporting) in view of growing demand for its product and competition from other MNCs. The initial project cost (consisting of Plant and Machinery including installation) is estimated to be US$ 500 million. The net working capital requirements are estimated at US$ 50 million. The company follows straight line method of depreciation. Presently, the company is exporting two million units every year at a unit price of US$ 80, its variable cost per unit being US$ 40.

The Chief Financial Officer has estimated the following operating cost and other data in respect of proposed project:

(i) Variable operating cost will be US $ 20 per unit of production;

(ii) Additional cash fixed cost will be US $ 30 million p.a. and project's share of all ocated fixed cost will be US $ 3 million p.a. based on principle of ability to share;

(iii) Production capacity of the proposed project in India will be 5 million units;

(iv) Expected useful life of the proposed plant is five years with no salvage value;

(v) Existing working capital investment for production & sale of two million units through exports was US $ 15 million;

(vi) Export of the product in the coming year will decrease to 1.5 million units in case the company does not open subsidiary company in India, in view of the presence of competing MNCs that are in the process of setting up their subsidiaries in India;

(vii) Applicable Corporate Income Tax rate is 35%, and

(viii) Required rate of return for such project is 12%. ADVICE X Inc. to establish the proposed project in India.

Note: 1. There will be no variation in the exchange rate of two currencies and all profits will be repatriated, as there will be no withholding tax.

2. Present value interest factor (PVIF) @12% for five years is as below:

Year	**1**	**2**	**3**	**4**	**5**
PVIF	0.8929	0.7972	0.7118	0.6355	0.5674

Answer66: Financial Analysis whether to set up the manufacturing units in India or not may be carried using NPV technique as follows:

I. Incremental cash outflows

	$ Million
Cost of Plant and Machinery	500,00
Working Capital	50.00
Release of existing Working Capital	(15.00)
	535.00

II. Incremental Cash Inflow after Tax (CFAT)

(a) Generated by investment in India for 5 years

	$ Million
Sales Revenue (5 million x $80)	400.00
Less: Costs	
Variable Cost (5 million x $20)	100.00
Fixed Cost	30.00
Depreciation ($500Million/5)	100.00
EBIT	170.00
Taxes@35%	59.50
EAT	110.50
Add: Depreciation	100.00
CFAT (1-5 years)	210.50
Cash flow at the end of the 5 years (Release of Working Capital)	35.00

(b) Cash generation by exports

	S Million

Sales Revenue (1.5 million x $80)	120.00
Less: Variable Cost (1.5 million x $40)	60.00
Contribution before tax	60.00
Tax@35%	21.00
CFAT (1-5 years)	39.00

(c) Additional CFAT attributable to Foreign Investment

	$ Million
Through setting up subsidiary in India	210.50
Through Exports in India	39.00
CFAT (1-5 years)	171.50

III. Determination of NPV

Year	**CFAT (S Million)**	**PVF@12**	**PV (S Million)**
1-5	171.50	3.6048	618.2232
5	35	0.5674	19.8590
			638.0822
Less: Initial Outflow			535.0000
			103.0822

Since NPV is positive the proposal should be accepted

Question67: XY Limited is engaged in large retail business in India. It is contemplating for expansion into a country of Africa by acquiring a group of stores having the same line of operation as that of India.

The exchange rate for the currency of the proposed African country is extremely volatile. Rate of inflation is presently 40% a year. Inflation in India is currently 10% a year. Management of XY Limited expects these rates likely to continue for the foreseeable future.

Estimated projected cash flows, in real terms, in India as well as African country for the first three years of the project are as follows:

	Year-0	**Year-1**	**Year-2**	**Year-3**
Cash flows in Indian	-50,000	-1,500	-2,000	-2,500
Rs. (000)				
Cash flows in African	-2,00,000	+50,000	+70,000	+90,000

XY Ltd. assumes the year 3 nominal cash flows will continue to be earned each year indefinitely. It evaluates all investments using nominal cash flows and a nominal discounting rate. The present exchange rate is African Rand 6 to Rs. 1.

You are required to calculate the net present value of the proposed investment considering the following:

(i) African Rand cash flows are converted into rupees and discounted at a risk adjusted rate.

(ii) All cash flows for these projects will be discounted at a rate of 20% to reflect it's high risk.

(iii) Ignore taxation.

	Year-1	Year-2	Year-3
PVIF @ 20%	.833	.694	.579

Answer67:

Calculation of NPV

Year	0	1	2	3
Inflation factor in India	1.00	1.10	1.21	1.331
Inflation factor in Africa	1.00	1.40	1.96	2.744
Exchange Rate (as per IRP)	6.00	7.6364	9.7190	12.3696
Cash Flows in Rs. 000				
Real	-50000	-1500	-2000	-2500
Nominal (1)	-50000	-1650	-2420	-3327.50
In india Rs. '000 (2)	-33333	9167	14117	19965
Net cash flow in Rs. '000 (1)+(2)	-83333	7517	11697	16637
PVF @ 20%	1	0.833	0.694	0.579
PV	-83333	6262	8118	9633

NPV of 3 year = -59320 (Rs. '000)

NPV of terminal value = $\frac{166.37}{0.20} \times 0.579 = 48164\ (Rs.'000)$

Total NPV of the project = - 59320 (Rs.'000) + 48164 (Rs.'000) = - 11156 (RS. '000)

Question68: Explain the problems that are faced in International Capital Budgeting Decision and how these can be overcome.

Answer68: The various types of problems faced in International Capital Budgeting analysis are as follows:

(1) Multinational companies investing elsewhere are subjected to foreign exchange risk in the sense that currency appreciates/ depreciates over a span of time. To include foreign exchange risk in the cash flow estimates of any project, it is necessary to forecast the inflation rate in the host country during the lifetime of the project. Adjustments for inflation are made in the cash flows depicted in local currency. The cash flows are converted in parent country's currency at the spot exchange rate multiplied by the expected depreciation rate obtained from purchasing power parity.

(2) Due to restrictions imposed on transfer of profits, depreciation charges and technical differences exist between project cash flows and cash flows obtained by the parent organization. Such restriction can be diluted by the application of techniques viz internal transfer prices, overhead payments. Adjustment for blocked funds depends on its opportunity cost, a vital issue in capital budgeting process.

(3) In multinational capital budgeting, after tax cash flows need to be considered for project evaluation. The presence of two tax regimes along with other factors such as remittances to the parent firm in the form of royalties, dividends, management fees etc., tax provisions with held in the host country, presence of tax treaties, tax discrimination pursued by the host country between transfer of realized profits vis-à-vis local re-investment of such profits cause serious impediments to multinational capital budgeting process. MNCs are in a position to reduce overall tax burden through the system of transfer pricing. For computation of actual after tax cash flows accruing to the parent firm, higher of home/ host country tax rate is used. If the project becomes feasible then it is acceptable under a more favourable tax regime. If not feasible, then, other tax saving aspects need to be incorporated in order to find out whether the project crosses the hurdle rate.

Question69: Odessa Limited has proposed to expand its operations for which it requires funds of $ 15 million, net of issue expenses which amount to 2% of the issue size. It proposed to raise the funds through a GDR issue. It considers the following factors in pricing the issue:

1. The expected domestic market price of the share is Rs. 300
2. 3 shares underly each GDR
3. Underlying shares are priced at 10% discount to the market price
4. Expected exchange rate is Rs. 60/$

Calculate the number of GDR's to be issued and cost of GDR to Odessa Limited, if 20% dividend is expected to be paid with a growth rate of 20%.

Answer69: Calculation of Number of GDR to be issued and Cost of GDR to Odessa Ltd

Net Issue Size = $15 million

$$\text{Gross issue} = \frac{\$\ 15 \text{ million}}{0.98} = \$15.306 \text{ million}$$

Issue Price per GDR in Rs. (300 x 3 x 90%) Rs. 810

Issue Price per GDR in S (Rs. 810/ Rs. 60) $13.50 Dividend Per GDR (D1) = Rs. 2* x 3

= Rs. 6

*Assumed to be on based on Face Value of Rs. 10 each share.

Net Proceeds Per GDR Rs. 810 x 0.98 Rs. 793.80

(a) Number of GDR to be issued

$$\frac{\$\ 15.306 \text{ million}}{\$\ 13.50} = 1.1338 \text{ million}$$

(b) Cost of GDR to Odessa Ltd

$$K_e = \frac{6.00}{793.80} + 0.20 = 20.76\%$$

Question70: There exists a vast difference between Project and Parent cash flow. EXPLAIN.

Answer70: There exists a big difference between the project and parent cash flows due to tax rules, exchange controls. Management and royalty payments are returns to the parent firm. The basis on which a project shall be evaluated depend on one's own cash flows, cash flows accruing to the parent firm or both. Evaluation of a project on the basis of own cash flows entails that the project should compete favourably with domestic firms and earn a return higher than the local competitors. If not, the shareholders and management of the parent company shall invest in the equity/government bonds of domestic firms. A comparison cannot be made since foreign projects replace imports and are not competitors with existing local firms. Project evaluation based on local cash flows avoid currency conversion and eliminates problems associated with fluctuating exchange rate changes. For evaluation of foreign project from the parent firm's angle, both operating and financial cash flows actually remitted to it form the yardstick for the firm's performance and the basis for distribution of dividends to the shareholders and repayment of debt/interest to lenders. An investment has to be evaluated on basis of net after tax operating cash flows generated by the project. As both types of cash flows (operating and financial) are clubbed together, it is essential to see that financial cash flows are not mixed up with operating cash flows.

Question71: XYZ Limited borrows £ 15 Million of six months LIBOR + 10.00% for a period of 24 months. The company anticipates a rise in LIBOR; hence it proposes to buy a Cap Option from its Bankers at the strike rate of 8.00%. The lump sum premium is 1.00% for the entire reset periods and the fixed rate of interest is 7,00% per annum. The actual position of LIBOR during the forthcoming reset period is as under:

Reset Period	LIBOR
1	9.00%
2	9.50%
3	10.00%

You are required to show how far interest rate risk is hedged through Cap Option.

For calculation, work out figures at each stage up to four decimal points and amount nearest to £. It should be part of working notes.

Answer71:

First of all, we shall calculate premium payable to bank as follows:

$$P = \frac{rp}{[\,(1-i)-\frac{1}{i\times(1+i)^t}]} \times A \text{ Or } \frac{rp}{PVAF\ (3.5\%.4)} \times A$$

Were

P = Premium

A = Principal Amount rp = Rate of

Premium

I = Fixed Rate of Interest t = Time

$$= \frac{0.01}{[\left(\frac{1}{0.035}\right) - \frac{1}{0.035\ \times 1.035^4}]} \text{ X } £15{,}000{,}000 \text{ or } \frac{0.01}{(0.966 + 0.933 + 0.901 + 0.871)} \times £15{,}000{,}000$$

$$= \frac{0.01}{[(28.5714) - \frac{4}{0.04016}} \times £15{,}000{,}000 \text{ or } \frac{\text{Rs. } 150{,}000}{3.671} = \text{Rs. } 40{,}861$$

Please note above solution has been worked out on the basis of four decimal points at each stage. Now we see the net payment received from bank

Reset Period	Additional interest due to rise in interest rate	Amount received from bank	Premium paid to bank	Net Amt. received from bank
1	£ 75,000	£ 75,000	£40,861	£34,139

2	£112,500	£112,500	£40,861	£71,639
3	£150,000	£150,000	£40,861	£109,139
Total	£337,500	£337,500	£122,583	£214,917

Thus, from above it can be seen that interest rate risk amount of E 337,500 reduced by £ 214, 917 by using of Cap option.

Note: It may be possible that student may compute upto three decimal points or may use different basis. In such case their answer is likely to be different

Question72: TM Fincorp has bought a 6 x 9 Rs. 100 crore Forward Rate Agreement (FRA) at 5.25%. On fixing date reference rate i.e., MIBOR turns out be as follows:

Period	Rate (%)
3 months	5.50
6 months	5.70
9 months	5.85

You are required to calculate:

(i) Profit/Loss to TM Fincorp. in terms of basis points.

(ii) The settlement amounts.

(Assume 360 days in a year)

Answer72:

(i) TM will make a profit of 25 basis points since a 6X9 FRA is a contract on 3-month Interest rate in 6 months, which turns out to be 5.50% (higher than FRA price).

(ii) The settlement amount shall be calculated by using the following formula

$$\frac{\text{dtm}}{\text{N(RR} - \text{FR)}\ (_{360}\quad)}$$
$$1 + \text{RR}\ (\frac{\text{dtm}}{360})$$

Were

N = Notional Principal Amount

RR = Reference Rate

FR = Agreed upon Forward Rate Dtm = FRA period specified in days.

Accordingly

$$\frac{100\text{crore}\ (\ 5.50\% - 5.25\%\ )\ (\ 92 + /360)}{1 + 0.055(92 * /360)} = \text{Rs. } 6{,}30{,}032$$

Hence there is profit of Rs. 6,30,032 to TM Fincorp.

* Alternatively, it can also be taken as 90 days.

Question73: Derivative Bank entered into a swap arrangement on a principal of Rs. 10 crores and agreed to receive MIBOR overnight floating rate for a fixed payment on the principal. The swap was entered into on Monday, 19th August, 2019 and was to commence on 20th August, 2019 and run for a period of 7 days.

Respective MIBOR rates for Tuesday to Monday were:

8.15%, 7.98%, 7.95%, 8.12%, 8.15%, 7.75%.

If Fixed Rate of Interest is 8%, then evaluate

(i) The nature of this Swap arrangement.

(ii) The Net Settlement amounts.

Notes:

(1) Sunday is Holiday.

(2) Work in rounded rupees and avoid decimal working.

(3) Consider 365 days in a year.

Answer73:

(i) The given swap arrangement is Plain Vanilla Overnight Index Swap (OIS).

(ii) To compute the Net Settlement amount we shall compute Interest as per floating rate as follows:

Day	Principal (Rs.)	MIBOR (%)	Interest (Rs.)
Tuesday	10,00,00,000	8.15	22,329
Wednesday	10,00,22,329	7.98	21,868
Thursday	10,00,44,197	7.95	21,790
Friday	10,00,65,987	8.12	22,261
Saturday & Sunday (*)	10,00,88,248	8.15	44,697
Monday	10,01,32,945	7.75	21,261
Total Interest @ Floating Rate (A)			1,54,206
Total Interest @ Fixed Rate (B) 10,00,00,000x 8.00% x $\frac{7}{365}$			1,53,425
Net Settlement Amount Paid			781

Question74: A textile manufacturer has taken floating interest rate loan of ₹ 40,00,000 on 1st April, 2012. The rate of interest at the inception of loan is 8.5% p.a. interest is to be paid every year on 31st March, and the duration of loan is four years. In the month of October 2012, the Central bank of the country releases following projections about the interest rates likely to prevail in future.

Dates	Interest Rate
31st March, 2013	8.75%
31st March, 2014	10.00%
31st March, 2015	10.50%
31st March, 2016	7.75%

(i) ADVISE how borrower can hedge the risk arising out of expected rise in the rate of interest when he is interested in pegging his interest cost at 8.50% p.a. and if option on Interest Rate is available at 0.75% p.a.

(ii) Assume that the premium negotiated by both the parties at the above-mentioned rate which is to be paid on upfront basis and the actual rate of interest on the respective due dates happens to be as follows:

EVALUATE how the settlement will be executed on the respective interest due dates. (MTP 8 Marks, March 22, MTP 6 Marks, Nov 21, April 23 & Sep 23, RTP May'22, Old & New SM)

Answer74:

1. As borrower does not want to pay more than 8.5% p.a., on this loan where the rate of interest is likely to rise beyond this, hence, he is advised to hedge the risk by entering into an agreement to buy interest rate caps with the following parameters:

- National Principal: 40,00,000/-
- Strike rate: 8.5% p.a.
- Reference rate: the rate of interest applicable to this loan

- Calculation and settlement date: 31st March every year
- Duration of the caps: till 31st March 2016
- Premium for caps: negotiable between both the parties

To purchase the caps this borrower is required to pay the premium upfront at the time of buying caps. The payment of such premium will entitle him with right to receive the compensation from the seller of the caps as soon as the rate of interest on this loan rises above 8.5%. The compensation will be at the rate of the difference between the rate of none of the cases the cost of this loan will rise above 8.5% calculated on ₹ 40,00,000/-. This implies that in none of the cases the cost of this loan will rise above 8.5%. This hedging benefit is received at the respective interest due dates at the cost of premium.

II. To evaluate the position of the borrower on respective dates we shall compute the interest cost as follows:

Dates	Interest Rate (a)	Exercise of Option	Compensation (b)	Net Cost (a)-(b)
31st March, 2013	10.20%	Yes	10.20%-8.50% = 1.70%	8.50%
31st March, 2014	11.50%	Yes	11.50%-8.50% = 3.00%	8.50%
31st March, 2015	9.25%	Yes	9.25%-8.50% = 0.75%	8.50%
31st March, 2016	8.25%	No	Nil	8.25%

Thus, form above it can be evaluated that the by paying an upfront premium of 40,000 each year the borrower can ensure that its interest rate cost does not exceed 8.50% p.a.

Question75: A dealer quotes 'All-in-cost' for a generic swap at 6% against six-month LIBOR flat. If the notional principal amount of swap is Rs. 8,00,000:

(i) Calculate semi-annual fixed payment.

(ii) Find the first floating rate payment for (i) above if the six-month period from the effective date of swap to the settlement date comprises 181 days and that the corresponding LIBOR was 5% on the effective date of swap.

(iii) In **(ii)** above, if the settlement is on 'Net' basis, how much the fixed rate payer would pay to the floating rate payer? Generic swap is based on 30/360 days basis.

Answer 11

(i) Semi-annual fixed payment

= (N) (AIC) (Period)

Where N = Notional Principal amount = Rs. 8,00,000

AIC All-in-cost 6% 0.06

= 8,00,000 × 0.06 $(\frac{180}{360})$

= 8,00,000 × 0.06 (0.5)

=Rs. 24,000

(ii) Floating rate payment

N (LIBOR) $(\frac{dt}{360})$

= 8,00,000 × 0.05 × $\frac{181}{360}$

= Rs.20,111 or Rs. 20,120

(iii) Net amount

= (i)-(ii)

Rs. 24,000-Rs. 20,111 Rs. 3,889

Or = Rs. 24,000-Rs. 20,120 Rs. 3,880

Question76: 18 an Indian firm has its subsidiary in Japan and Zaki a Japanese firm has its subsidiary in India and face the following interest rates:

Company	IB	Zaki
INR floating rate	BPLR+0.50%	BPLR+2.50%
JPY (Fixed rate)	2%	2.25%

Zaki wishes to borrow Rupee Loan at a floating rate and IB wishes to borrow JPY at a fixed rate. The amount of loan required by both the firms is same at the current exchange rate. A financial institution may arrange a swap and requires 25 basis points as its commission. Gain, if any, is to be shared by the firms equally.

You are required to find out:

(i) Whether a swap can be arranged which may be beneficial to both the firms?

(ii) What rate of interest will the firms end up paying?

Answer76: Though Company IB has an advantage in both the markets but it has comparative more advantage in the INR floating-rate market. Company Zaki has a comparative advantage in the JPY fixed interest rate market.

However, company IB wants to borrow in the JPY fixed interest rate market and company Zaki wants to borrow In the INR floating-rate market. This gives rise to the swap opportunity.

IB raises INR floating rate at BPLR + 0.50% and Zaki raises JPY at 2.25%

Total Potential Gain = (INR interest differential) - (Yen rate differential)
(BPLR+2.50% BPLR+0.50%) + (2%- 2.25%) = 1.75%
Less Banker's commission (To be shared equally) = 0.25%
Net gain (To be shared equally: 0.75% each) = 1.50%
(1) Yes, a beneficial swap can be arranged (ii) Effective cost of borrowing = pays to lenders + pays to other party - receives from other party + banker's commission
IB BPLR+0.50%+1.125%*- (BPLR+0.50%) +0.125% = 1.25%
(* has been arrived as 2%-0.75%-0.125%) Zaki = 2.25%+ BPLR+0.50%-1.125%+0.125% BPLR+1.75%

Question77: Explain various methods of hedging of interest rate risk. (PYP 4 Marks Nov 22)

Answer77: Methods of Hedging of Interest Rate Risk can be broadly divided into following two categories:

(A) Traditional Methods: These methods can further be classified in following categories:

(I) Asset and Liability Management (ALM): ALM is a comprehensive and dynamic framework for measuring, monitoring and managing the market risk of a bank. It is the management of structure of Balance Sheet (liabilities and assets) in such a way that the net earnings from interest are maximized within the overall risk preference (present and future) of the institutions.

(iI) Forward Rate Agreement (FRA): Normally it is used by banks to fix interest costs on anticipated future deposits or interest revenues on variable-rate loans Indexed to Benchmark Interest Rate e.g., LIBOR, MIBOR etc. A bank that sells an FRA agrees to pay the buyer the increased interest cost on some "notional" principal amount if Reference Rate of some specified maturity is above a stipulated "Forward Interest Rate" on the contract maturity or settlement date. Conversely, the buyer agrees to pay the seller any decrease in interest cost if Reference Rate fall below the forward rate.

(B) Modern Methods: These methods can further be classified in following categories:

(i) Interest Rate Futures (IRF): An interest rate future is a contract between the buyer and seller agreeing to the future delivery of any interest-bearing asset. The interest rate future allows the buyer and seller to lock in the price of the interest-bearing asset for a future date.

(ii) Interest Rate Options (IRO): Also known as Interest Rate Guarantee (IRG) as option is a right not an obligation and acts as insurance by allowing businesses to protect themselves against adverse Interest rate movements while allowing them to benefit from favourable movements.

It should be noted that the IRO is basically a series of FRAs which are exercisable at predetermined bench marked interest rates on each period say 3 months, 6 months etc.

(iii) Interest Rate Swaps: In an interest rate swap, the parties to the agreement, termed the swap counterparties, agree to exchange payments indexed to two different interest rates. Total payments are determined by the specified notional principal amount of the swap, which is never actually exchanged.

(iv) Swaptions: An interest rate swaption is simply an option on an interest rate swap. It gives the holder the right but not the obligation to enter into an interest rate swap at a specific date in the future, at a particular fixed rate and for a specified term.

Question78: Using the chop-shop approach (or Break-up value approach), assign a value for Cranberry Ltd. whose stock is currently trading at a total market price of €4 million. For Cranberry Ltd, the accounting data set forth three business segments: consumer wholesale, retail and general centers. Data for the firm's three segments are as follows:

Business Segment	**Segment Sales**	**Segment Assets**	**Segment Operating Income**
Wholesale	€225,000	€ 600,000	€ 75,000
Retail	€ 720,000	€ 500,000	€ 150,000

General	€ 2,500,000	€ 4,000,000	€ 700,000

Industry data for "pure-play" firms have been compiled and are summarized as follows:

Business Segment	Capitalization/Sales	Capitalization/Asset	Capitalization/Operating Income
Wholesale	**0.85**	**0.7**	**9**
Retail	**1.2**	**0.7**	**8**
General	**0.8**	**0.7**	**4**

Answer79:

Business Segment	Capital-to	Segment Sales	Theoretical Values
Wholesale	0.85	€225000	€191250
Retail	1.2	€720000	€864000
General	0.8	€2500000	€2000000
Total value			€3055250
Business Segment	**Capital-to-Assets**	**Segment Assets**	**Theoretical Values**
Wholesale	0.7	€600000	€420000
Retail	0.7	€500000	€350000
General	0.7	€4000000	€2800000
Total value			€3570000
Business Segment	**Capital-to Operating Income**	**Operating Income**	**Theoretical Values**
Wholesale	9	€75000	€675000
Retail	8	€150000	€1200000
General	4	€700000	€2800000
			€4675000

Average theoretical value = $\frac{3055250+3570000+4675000}{3} = 3766750$

Average theoretical value of cranberry Ltd. = €3766750

Question80: Delta Ltd.'s current financial year's income statement reports its net income as Rs. 15,00,000. Delta's marginal tax rate is 40% and its interest expense for the year was Rs. 15,00,000. The company has Rs. 1,00,00,000 of invested capital, of which 60% is debt. In addition, Delta Ltd. tries to maintain a Weighted Average Cost of Capital (WACC) of 12.6%.

(i) Calculate the operating income or EBIT earned by Delta Ltd. in the current year.

(ii) Calculate the Delta Ltd.'s Economic Value Added (EVA) for the current year?

(iii) Delta Ltd. has 2,50,000 equity shares outstanding. According to the EVA you calculated in (ii),

Evaluate how much can Delta pay in dividend per share before the value of the company would start to decrease? If Delta does not pay any dividends, Evaluate what would you expect to happen to the value of the company? (MTP 8 Marks March '19, RTP Nov '22, Old & New SM)

Answer80:

(i) Taxable income = Net Income /(1-0.40)

or, Taxable income Rs. 15,00,000/(1-0.40) = Rs. 25,00,000 Again, taxable income = EBIT - Interest

or, EBIT Taxable Income + Interest

=Rs. 25,00,000+ Rs. 15,00,000= Rs. 40,00,000

(ii) EVA EBIT (1-T) (WACC Invested capital)

= Rs. 40,00,000 (1-0.40)-(0.126 Rs. 1,00,00,000)

= Rs. 24,00,000-Rs. 12,60,000 = Rs. 11,40,000

(iii) EVA Dividend = Rs. 11,40,000/2,50,000 = Rs. 4.56

If Delta Ltd, does not pay a dividend, we would expect the value of the firm to Increase because it will achieve higher growth, hence a higher level of EBIT. If EBIT is higher, then all else equal, the value of the firm will increase.

Question81: The following information is given for 3 companies that are identical except for their capital structure:

	Orange	Grape	Apple
Total invested capital	1,00,000	1,00,000	1,00,000
Debt/assets ratio	0.8	0.5	0.2
Shares outstanding	6,100	8,300	10,000
Pre-tax cost of debt	16%	13%	15%
Cost of equity	26%	22%	20%
Net Income	8,970	12,350	14,950

The tax rate is uniform 35% in all cases.

(i) Compute the Weighted average cost of capital for each company.

(ii) Compute the Economic Valued Added (EVA) for each company.

(iii) Based on the EVA, which company would be considered for best investment? Give reasons.

(iv) If the industry PE ratio is 11x, estimate the price for the share of each company.

(v) Calculate the estimated market capitalization for each of the Companies.

Note: Round off EPS and Share Prices upto 4 and 2 Decimal places respectively.

(i) Working for calculation of WACC

	Orange	Grape	Apple
Total debt	80,000	50,000	20,000
Post tax Cost of debt	10.4%	8.45%	9.75%
Equity Fund	20,000	50,000	80,000

WACC			
Orange	(10.4 x 0.8)+(26 x 0.2)	=	13.52%
Grape:	(8.45 x 0.5) + (22 x 0.5)	=	15.225%
Apple:	(9.75 x 0.2)+(20 x 0.8)	=	17.95%

(ii) EVA of companies can be computed as follows:

	Orange	Grape	Apple
Net Income (Rs.)	8,970	12,350	14,950
Pre Tax Income (Rs.) (A)	13,800	19,000	23,000
Debt Amount (Rs.)	80,000	50,000	20,000
Interest (Rs.) (B)	12,800	6,500	3,000
EBIT (Rs.) (A)+(B)	26,600	25,500	26,000
Tax 35% (Rs.)	9,310	8,925	9,100
EAT	17,290	16,575	16,900
Less: WACC X Invested Capital	13,520	15,220	17,950
EVA (Rs.)	3,770	1,355	-1050

(iii) Orange would be considered as the best investment since the EVA of the company is highest and its weighted average cost of capital is the lowest.

(iv) Estimated Price of each company shares

	Orange	**Grape**	**Apple**
Net Income (Given) (Rs.)	8,970	12,350	14,950
Shares	6,100	8,300	10,000
EPS (Rs.)	1.4705	1.4880	1.4950
Stock Price (EPS x PE Ratio) (Rs.)	16.18	16.37	16.45

Alternate Answer

Estimated Price of each company shares

	Orange	**Grape**	**Apple**
EBIT (Rs.)	26,600	25,500	26,000
Interest (Rs.)	12,800	6,500	3,000
Taxable Income (Rs.)	13,800	19,000	23,000
Tax 35% (Rs.)	4,830	6,650	8,050
Net Income (Rs.)	8,970	12,350	14,950
Shares	6,100	8,300	10,000
EPS (Rs.)	1.4705	1.488	1.495
Stock Price (EPS x PE Ratio) (Rs.)	16.18	16.37	16.45

(v) Market Capitalization

Estimated Stock Price (Rs.)	16.18	16.37	16.45
No. of share	6,100	8,300	10,000
Estimated Market Cap (Rs.)	98,698	1,35,871	1,64,500
Alternative Answer			
Estimated Stock Price (Rs.)	14.30	15.94	15.73
No. of shares	6,100	8,300	10,000
Estimated Market Cap (Rs)	87,230	1,32,302	1,57,300

Question83: ABC Co. is considering a new sales strategy that will be valid for the next 4 years. They want to know the value of the new strategy. Following information relating to the year which has just ended, is available:

Income statement	Rs.
Sales	20,000
Gross margin (20%)	4,000
Administration, Selling & distribution expense (10%)	2,000
PBT	2,000
Tax (30%)	600
PAT	1,400
Balance Sheet Information	
Fixed Assets	8,000
Current Assets	4,000

Equity	12,000

If it adopts the new strategy, sales will grow at the rate of 20% per year for three years. The gross margin ratio, Assets turnover ratio, the Capital structure and the income tax rate will remain unchanged.

Depreciation would be at 10% of net fixed assets at the beginning of the year.

The Company's target rate of return is 15%.

Calculate the incremental value due to adoption of the strategy.

Answer84:

Projected Balance Sheet				
	Year1	**Year2**	**Year3**	**Year4**
Fixed Assets (40% of Sales)	9,600	11,520	13,824	13,824
Current Assets (20% of Sales)	4,800	5,760	6,912	6,912
Total Assets	14,400	17,280	20,736	20,736
Equity	14,400	17,280	20,736	20,736
Projected Cash Flows:-				
	Year1	**Year2**	**Year3**	**Year4**
Sales	24,000	28,800	34,560	34,560
PBT (10% of sale)	2,400	2,880	3,456	3,456
PAT (70%)	1,680	2,016	2,419.20	2,419.20
Depreciation	800	960	1,152	1,382
Addition to Fixed	2,400	2,880	3,456	1,382

Assets				
Increase in Current Assets	800	960	1,152	-
Operating cash flow (FCFF)	(720)	(864)	(1,036.80	2,419.20

Projected Cash Flows:-

Present value of Projected Cash Flows:-

Cash Flows	PVF at 15%	PV
-720	0.870	-626.40
-864	0.756	-653.18
-1,036.80	0.658	-682.21
		-1,961.79

Residual value - 2419.20/0.15 = 16,128

Present value of Residual value	=	$16128/(1.15)^3$	
	=	16128/1.521= 10603.55	
Total shareholders' value	=	10,603,55-1,961.79 =	8,641.76
Pre strategy value	=	1,400/0.15 = 9,333.33	
∴Value of strategy	=	8,641.76-9,333.33	-691.57

Conclusion: The strategy is not financially viable. However, it may be viable considering other non-financial factors

Question85: Eon Ltd. reported a profit of 120 lakhs after 20% tax for the financial year 2019-20. An analysis of the accounts revealed that the income included extraordinary items of 5 lakhs

and an extraordinary loss of 15 lakhs. The existing operations, except for the extraordinary items, are expected to continue in the future. In addition, the results of the launch of a new product are expected to be as follows:

	Rs. In lakhs
Sales	100
Material costs	10
Labour costs	20
Fixed costs	20

You are required to:

(i) CALCULATE the value of the business, given that the capitalization rate is 10%.

(ii) DETERMINE the market price per equity share, with Eon Ltd.'s share capital being comprised of 1,00,000 13% preference shares of 100 each and 50,00,000 equity shares of 10 each and the P/E ratio being 10 times.

i. Computation of Business Value

		(Rs. Lakhs)
Profit before tax 120 (1-0.20)		150
Less: Extraordinary income		(5)
Add: Extraordinary losses		15
Profit from new product	(Rs lakhs)	160
Sales	100	
Less: material cost 10		
Labour costs 20		
Fixed cost 20	(50)	50
		210.00
Less: taxes @20%		42.00

Future maintainable profit after taxes		168.00
Relevant capitalization factor		0.10
Value of business (Rs168/0.10)		1680

ii. Determination of market price of equity share

Future maintainable profits (After Tax) Less: Preference share dividends 1,00,000 shares of 100 @ 13%	168,00,000 13,00,000
Earnings available for Equity Shareholders No. of Equity Shares	155,00,000 50,00,000
Earning per share = 155,00,000 50,00,000	Rs.3.10
PE ratio	10
Market price per share	Rs.31

Question86: Differentiate between EVA and MVA. (Old & New SM, PYP 4 Marks Nov '20)

Answer86:

Economic Value Added

Economic Value Added (EVA) is a holistic method of evaluating a company's financial performance, which means that EVA is used not only as a mere valuation technique, but also to find the economic contribution of a company to the society at large. The core concept behind EVA is that a company generates 'value' only if there is a creation of wealth in terms of returns in excess of its cost of capital invested. EVA insists on separation of firm's operation from its financing. So if a company's EVA is negative, it means the company is not generating value from

the funds invested into the business. Conversely, a positive EVA shows a company is producing value from the funds invested in it..

Why EVA? Up to now we have seen several financial performance metrics like ROI, ROCE, etc. and also several approaches based on asset base/earnings / FCFs to finding out the 'worth of the entity. Then what is the need for EVA? Or in other words, what is the gap that EVA is trying to fill in, that others couldn't?

The answer to the above is the way EVA looks at performance of the 'management of a company. To elaborate, all the approaches seen up to now were just a function of 'number-crunching'. But EVA tries to make management more accountable to their individual decisions and the impact of decisions on the path to progress of the company. Take a simple example if there are two dissimilar but equal risk opportunities that are feasible and the management needs to take a decision, it would most probably go by the project which would break-even earlier. In choosing so it is also cutting down the risk of future losses, fair enough. However, had the management invested in both the projects, still it would have generated a positive IRR, though the second one would have had a larger pay-back period. This impact of management's strategic decision making comes out evidently in EVA computations, whereas under the techniques seen till now, this performance-driven aspect would have never been highlighted. The efficiency of the management gets highlighted in EVA, by evaluating whether returns are generated to cover the cost of capital.

EVA is a performance measure for management of the company, and this is as evident in its calculation formula as 'the excess of returns over the weighted average cost of invested capital'. The formula is as below

EVA = NOPAT- (Invested Capital * WACC) OR

NOPAT-Capital Charge

Market Value Added

The 'MVA' (Market Value Added) simply means the Current Market Value of the firm minus the Invested Capital that we obtained above. Let the current MV of the firm be 1000. Hence MVA will be -

1000 - 920 = 80.

MVA is an attempt to resolve some of the issues involved in EVA e.g. ignoring Value Drivers, Book Value etc. Though MVA itself does not give any basis of share valuation but an alternative way to gauge performance efficiencies of an enterprise, albeit from a market capitalization point of view, the logic being that the market will discount the efforts taken by the management fairly. Hence, the MVA of 80 arrived in example above is the true value added that is perceived by the market. In contrast, EVA is a derived value added that is for the more discerning Investor.

Since MVA represents market views regarding company's future value generation companies with a higher MVA will naturally become the darlings of the share market, and would eventually become 'pricey from a pure pricing perspective. In such cases, the EVA may also sometimes have a slightly negative correlation as compared to MVA. But this will be a short term phenomenon as eventually the gap will get closed by investors themselves. A stock going ex-dividend will exhibit such propensities.

We can conclude that the main objective of EVA is thus to show management efficiency in generating returns over and above the hurdle rate of invested capital.

Question87: T Ltd. and E Ltd. are in the same industry. The former is in negotiation for acquisition of the latter. Important information about the two companies as per their latest financial statements is given below:

	T Ltd.	**E Ltd**
Rs. 10 Equity shares outstanding	12 Lakhs	6 Lakhs

Debt:		
10% Debentures (Rs. Lakhs)	580	-
12.5% Institutional Loan (Rs. Lakhs)	-	240
Earning before interest, depreciation and tax (EBIDAT) (Rs. Lakhs)	400.86	115.71
Market Price/share (Rs.)	220.00	110.00

T Ltd. plans to offer a price for E Ltd., business as a whole which will be 7 times EBIDAT reduced by outstanding debt, to be discharged by own shares at market price.

E Ltd. is planning to seek one share in T Ltd. for every 2 shares in E Ltd. based on the market price. Tax rate for the two companies may be assumed as 30%.

ANALYZE the following under both alternatives i.e. as per T Ltd.'s offer and E Ltd.'s plan:

(i) Net consideration payable.

(ii) No. of shares to be issued by T Ltd.

(iii) EPS of T Ltd. after acquisition.

(iv) Expected market price per share of T Ltd. after acquisition.

Note: Calculations (except EPS) may be rounded off to 2 decimals in lakhs.

As per T Ltd.'s Offer

	Rs. In lakh
(i) Net Consideration Payable	
7 times EBIDAT, 1.e. 7 x Rs. 115.71 lakh	809.97
Less: Debt	240.00

(ii) No. of shares to be issued by T Ltd	569.97
Rs. 569.97 lakh/Rs. 220 (rounded off) (Nos.) 2,59,000	2,59,000
(iii) EPS of T Ltd after acquisition	
Total EBIDT (Rs. 400.86 lakh + Rs. 115.71 lakh)	516.57
Less: Interest (Rs. 58 lakh + Rs. 30 lakh)	88.00
	428.57
Less: 30% Tax	128.57
Total earnings (NPAT)	300.00
Total no. of shares outstanding	14.59 lakh
(12 lakh +2.59 lakh)	
EPS (Rs. 300 lakh/ 14.59 lakh)	Rs. 20.56

Expected Market Price:

Pre-acquisition P/E multiple:	
EBIDAT	400.86
Less: Interest (580 × 10/100)	58.00
	342.86
No. of shares (lakhs)	12.00
EPS	Rs. 20.00
Hence, PE multiple 220/20	11
Expected market price after acquisition (Rs. 20.56 x 11)	Rs. 226.16

As per E Ltd's Plan

	Rs. in lakhs

(i) Net consideration payable	
6 lakhs shares x Rs. 110	660
(ii) No. of shares to be issued by T Ltd	
Rs.660 lakhs ÷ Rs.220 or 6 lakh × 0.50	3 lakhs
(iii) EPS of T Ltd after acquisition	
NPAT (as per earlier calculations)	300.00
Total no. of shares outstanding (12 lakhs + 3 lakhs)	15 lakh
Earnings per share (EPS) Rs.300 lakh/15 lakh	Rs. 20.00
(iv) expected market price (Rs. 20 × 11)	220.00

Question88: Following information is provided relating to the acquiring company Mani Ltd. and the target company Ratnam Ltd:

	Mani Ltd.	**Ratnam Ltd.**
Earnings after tax (Rs. lakhs)	2,000	4,000
No. of shares outstanding (lakhs)	200	1,000
P/E ratio (No. of times)	10	5
Required:		

(i) What is the swap ratio based on current market prices?

(ii) What is the EPS of Mani Ltd. after the acquisition?

(iii) What is the expected market price per share of Mani Ltd. after the acquisition, assuming its P/E ratio is adversely affected by10%?

(iv)Determine the market value of the merged Co.

(v) Calculate gain/Loss for the shareholders of the two independent entities ,due to the merger.

Ans-

(i)SWAP ratio based on current Market price:	
EPS before acquisition :	
Mani Ltd:Rs.2,000 lakhs /200 lakhs	Rs.10
Ratnam Ltd:Rs.4,000 lakhs/1,000 lakhs:	
Before acquisition :	
Mani Ltd:Rs.10×10	Rs.100
Ratbnam Ltd:Rsd.4 /5	Rs.20
SWAP ratio:20/100 or 1/5 i.e.	0.20
(ii) EPS After acquisition :	
$=\frac{(2,000+4,000)}{(2,00+2,00)Lakhs}$=Rs.15	
(iii) Market Price After Acquisition -	
EPS after acquisition :	Rs.15.00
P/E ratio after acquisition	9
Market perice of share (Rs.15 ×9)	Rs.135
(iv)Market Value of the merged Co.	
Rs.135×400 Lakhs share Rs.540.00 Crore or 54,000 Lakhs	

(v) Gain /Loss per share:

	Mani Ltd.	**Ratnam Ltd.**
Total value before Acquisition	200	200
Value after acquisition	270	270
Gain (Total)	70	70
No. of share (pre-merger)(Lakhs)	200	1,000
Gain per share (Rs.)	35	7

Question-89 You have been provided the following financial data of two companies :

	Krishna Ltd.	**Rama Ltd.**
Earning After tax	Rs.7,00,000	Rs.10,00,000
No. of Equity shares (outstanding)	2,00,000	4,00,000
EPS	3.5	2.5
P/E ratio	10 times	14 times
Market price per share	Rs.35	Rs.35

Company Rama Ltd.is acquiring the company Krishna Ltd.exchanging its shares on one-to-one basis for company Krishna Ltd.The exchange ratio is based on the market prices of the shares of the two companies .

Required:

(i) What will be the EPS subsequent to merger?

(ii)What is the change in EPS for the shareholders of companies Rama Ltd.and Krishna Ltd?

(iii)Determine the market value of the Post-merger firm.PE ratio is likely to remain the same.

Ascertain the profits accruing to shareholders of both the companies.

Ans-

(i)	Exchange Ratio New Shares to be issued	1:1 2,00,000
	Total share of Rana Ltd.(4,00,000+2,00,000)	6,00,000
	Total earning (Rs.10,00,000+Rs.7,00,000)	Rs.17,00,000
	New EPS (Rs.17,00,000/6,00,000)	Rs.2.83
(ii)	Existing EPS of Rama Ltd.	Rs.2.50
	Increase in EPS of Rama Ltd (Rs.2.83 –Rs.2.50)	Rs.0.33
	Existing EPS of Krishna Ltd.	Rs.3.50

	Decrease in EPS of Krishna Ltd.(Rs.3.50 -2.83)	Rs.0.67
(iii)	P/E ratio of new firm (expected to remain same)	14 times
	New Market price (14×Rs.2.83)	Rs.39.62
	Total No. of shares	6,00,000

Total market Capitalization (6,00,000×39.62)Rs.2,37,72,000

Existing Market Capitalization (Rs.70,00,000+Rs.1,40,00,000)=Rs.2,10,00,000

Total gain Rs.27,72,000

(iv)

	Rama Ltd.	Krishna Ltd.	Total
No. of shares after merger	4,00,000	2,00,000	6,00,000
Market price	Rs.39.62	Rs.39.62	Rs.39.62
Total Market value	Rs.1,58,48,000	Rs.79,24,000	Rs.2,37,72,000
Existing Market value	Rs.1,40,00,000	Rs.70,00,000	Rs.2,10,00,000
Gain to share holders	Rs.18,48,000	Rs.9,24,000	Rs.27,72,000

Or Rs.27,72,000/3=Rs.9,24,000 to Krishna Ltd and Rs.18,48,000 to Rama Ltd (in2 :1 ratio)

Question-90 M.Co.Ltd.is studying the possible acquisition of N Co.Ltd ,by way of merger.The following data are available in respect of the companies:

Particulars	N Co. Ltd .	N Co.Ltd.
Earning after tax (Rs.)	80,00,000	24,00,000
No.of equity Shares	16,00,000	4,00,000

Market value per Share(Rs.)	200	160

(i)If the merger goes through by exchange of equity and the exchange ratio is based on the current market price,what is the new earning per share for M.Co Ltd?

(ii) N Co.Ltd.wants to be sure that the earning available to its shareholders wil not be diminished by the merger.What should be the exchange ratio in that case?

Ans-(i) Calculation of new EPS of M Co.Ltd.

No. of equity shares to be issued by M Co.Ltd. to N Co.Ltd.

=4,00,000 shares ×Rs.160/Rs.2,00=3,20,000 shares

Total no.of shares in M.Co.Ltd after acquisition of N Co.Ltd.

=16,00,000+3,20,000=19,20,000

Total earning after tax (after acquisition)

=80,00,000+24,00,000=1,04,00,000

EPS=$\frac{Rs.1,04,00,000}{1,920,000\ equity\ shares}$=5.42

(ii)Calculation of exchange ratio which would not diminish the EPS of N.Co.Ltd. after its merger with M Co.Ltd.

Current EPS :

M.Co.Ltd.=$\frac{Rs.80,00,000}{16,00,000\ equity\ \ Shares}$=5

N.Co.Ltd =$\frac{Rs.24,00,000}{4,00,000\ equity\ shares}$=6

Exchange ratio=6/5=1.20

No.of new shares to be issued by M Co. Ltd to N Co. Ltd.

=4, 00,000×1.20=4, 80,000 Shares

Total number of shares of M Co.Ltd.after acquisition

=16, 00,000 Ratio +4, 80,000=20, 80,000 shares

EPS after merger =$\frac{Rs.1,04,00,000}{20,80,000\ equity\ \ shares}$=5

Total earning in M Co. Ltd. available to new shareholders of N Co. Ltd.

=4, 80,000×Rs.5 =Rs.24, 00,000

Recommendation: The exchange ratio (6 for 5) based on market shares is beneficial to shareholders of 'N' Co.Ltd.

Q-91 Longitude Limited is in the process of acquiring Latitude limited on a share exchange basis. Following relevant data are available:

		Longitude Limited	Longitude Limited
Profit after tax (PAT)	(Rs.in lakhs)	120	80
Number of shares		15	16
Earning per Share (EPS)		8	5
Price Earnings Ratio (P/E Ratio)		15	10
(Ignore Synergy)			

You are required to determine:

(i) Pre-merger Market Value per Share, and

(ii) The maximum exchange ratio Longitude Limited can offer without the dilution of

(1) EPS and

(2) Market Value per Share

Calculate Ratio/s up to four decimal points and amounts and number of shares up to two decimal points.

(i) Pre Merger Market Value of Per Share P/E Ratio X EPS

Longitude Ltd. 8 X 15 = 120.00

Latitude Ltd. ₹5X10 ₹50.00

(ii) Maximum exchange ratio without dilution of EPS

Pre Merger PAT of Longitude Ltd.	Rs.120 lakhs
Pre Merger PAT of Latitude Ltd	Rs.80 Lakhs
Combined PAT	Rs.200 Lakhs
Longitude Ltd. 's EPS	Rs.8
Maximum number of shares of Longitude after merger (200 lakhs/₹8)	25 Lakhs
Existing number of shares	15 Lakhs
Maximum number of shares to be exchanged	10 Lakhs

Maximum share exchange ratio 10:16 or 5:8

(2) Maximum exchange ratio without dilution of Market Price Per Share

Pre Merger Market Capitalization of Longitude Ltd. (120 x 15 Lakhs)	Rs.1800 Lakhs
Pre Merger Market Capitalization of Latitude Ltd. (50 x 16 Lakhs)	Rs.800 Lakhs
Combined Market Capitalization	Rs.2600 Lakhs
Current Market Price of share of Longitude	₹120

Ltd.	
Maximum number of shares to be exchanged of Longitude (surviving company) (2600 Lakhs/₹120	21.67 Lakhs
Current Number of Shares of Longitude Ltd.	15.00 Lakhs
Maximum number of shares to be exchanged (Lakhs)	6.67 Lakhs

Maximum share exchange ratio 6.67:16 or 0.4169:1

Q-92 P Ltd. is considering take-over of R Ltd. by the exchange of four new shares in P Ltd. for every five shares in R Ltd. The relevant financial details of the two companies prior to merger announcement are as follows:

	P Ltd.	R Ltd.
Profit before Tax (Crore)	15	13.50
No. of Shares (Crore)	25	15
P/E Ratio	12	9
Corporate Tax Rate 30%		

You are required to determine:

(i) Market value of both the company.

(ii) Value of original shareholders.

(iii) Price per share after merger.

(iv) Effect on share price of both the company if the Directors of P Ltd. expect their own pre-merger P/E ratio to be applied to the combined earnings.

Ans-

	P Ltd.	**R. Ltd.**
Profit before Tax (in crore)	15	13.50
Tax 30% (in crore)	4.50	4.05
Profit after Tax (in crore)	10.50	9.45
Earning per Share (₹)	10.50×Rs.0.42	9.45 0.63
	25	15
Price of Share before Merger	Rs.0.42 x 12 = 5.04-	Rs.0.63 x 9 = 5.67
(EPS x P/E Ratio)		

(i)Market Value of company

P Ltd. ₹ 5.04 x 25 Crore ₹ 126 crore R

Ltd. = 5.67 x 15 Crore = ₹ 85.05 crore

Combined = 12685.05 211.05 Crores After Merger

	P.Ltd.	R.Ltd
No.of shares	25 Crores	15x 4/5= 12 crores
	37 Crores	
Combined % of Combined Equity Owned	$=\frac{25}{37}x100 = 67.57\%$	$=\frac{12}{37}x100 = 32.43\%$

(ii) Value of Original Shareholders

P.Ltd.	R.Ltd
Rs.211.05 crore x 67.57%	Rs.211.05 crore x 32.43%
= 142.61	= 68.44

Alternatively, it can also be computed as follows:

Combined Value of Entity	211.05 Core
No. of shares after Merger	37 Core
Value of Per Share	Rs.5.70405
Value of P Ltd. Shareholders (25 crores x 5.70405)	Rs. 142.60 crore
Value of R Ltd. Shareholders (12 crores x 5.70405)	Rs. 68.45 crore

(iii) Price per share after Merger

$=\frac{19.95\ Crore}{37\ Crore}$=Rs.0.539 per share

P/E Ratio =12

Market Value per Share =Rs.0.539×12=Rs.6.47

Total Market Value=Rs.6.47 ×37 crore =Rs.239.39 Core

Price per Share =$\frac{Market\ Value}{Number\ of\ Shares}=\frac{239.39}{37\ Crore}$=Rs.6.47

(iv)Effect on Share Price

P.Ltd

Gain/Loss (-)per share =Rs.6.47-Rs.5.04 =Rs.1.43

i.e.$\frac{6.47\times5.04\times100}{5.04}$=0.284 0r 28.4%

Share price would rise by 28.4%

R Ltd.

=$\frac{6.47X4}{5}$=Rs.5.18

Gain/Loss (-) per share =Rs.5.18 –Rs.5.67=(-Rs.0.49)

i.e.$\frac{5.18,5.67X100}{5.67}$(-)0.0864 or (-)8.64% Share price would decrease by 8.64%.

Question- 93 Simple Ltd. and Dimple Ltd. are planning to merge. The total value of the companies is dependent on the fluctuating business conditions. The following information is given for the total value (debt + equity) structure of each of the two companies.

Business Condition	Probability	Simple Ltd. Lacs	Dimple Ltd. Lacs
High Growth	0.20	820	1050
Medium Growth	0.60	550	825
Slow Growth	0.20	410	590

The current debt of Dimple Ltd. is ₹ 65 lacs and of Simple Ltd. is ₹ 460 lacs. Calculate the expected value of debt and equity separately for the merged entity.

Ans-Compute Value of Equity

	High Growth	Medium Growth	Slow Growth
Debt +Equity	820	550	410
Less:Debt	460	460	460
Equity	360	90	-50

Since the Company has limited liability the value of equity cannot be negative therefore the value of equity under slow growth will be taken as zero because of insolvency risk and the value of debt is taken at 410 lacs. The expected value of debt and equity can then be calculated as:

Simple Ltd.

	High Growth		Medium Growth		Slow Growth		Expected Value
	Prob.	Value	Prob.	Value	Prob.	Value	
Debt	0.20	460	0.60	460	0.20	410	450

Equity	0.20	360	0.60	90	0.20	0	126
		820		550		410	576

Dimple Ltd.

	High Growth		**Medium Growth**		**Slow Growth**		**Expected Value**
	Prob.	Value	Prob.	Value	Prob.	Value	
Debt	0.20	985	0.60	760	0.20	525	758
Equity	0.20	65	0.60	65	0.20	65	65
		1050		825		590	823

Expected Values

Equity		**Debt**	
Simple Ltd.	126	Simple Ltd.	450
Dimple Ltd.	758	Dimple Ltd.	65
	884		515

Q-94 Yes Ltd.wants to acquire No.Ld. and the cash flows of Yes Ltd. And the merged entity are given below:

Year	1	2	3	4	5
Yes Ltd.	175	200	320	340	350
Merged Entity	400	450	525	590	620

Earnings would have witnessed 5% constant growth rate without merger and 6% with merger on account of economies of operations after 5 years in each case. The cost of capital is 15%.

The number of shares outstanding in both the companies before the merger is the same and the companies agree to an exchange ratio of 0.5 shares of Yes Ltd. for each share of No Ltd.

PV factor at 15% for years 1-5 are 0.870, 0.756; 0.658, 0.572, 0.497 respectively. You are required to:

(i) Compute the Value of Yes Ltd. before and after merger.

(ii) Value of Acquisition and

(iii) Gain to shareholders of Yes Ltd.

Ans-(i) Working Notes:

Present Value of Cash Flows(CF) upto 5 years

Year 1	**CF of Yes Ltd.(Rs.)**	**PVF @15 %**	**PV of CF (Rs.Lakhs)**	**CF of Margerd Entity (Rs.Lakhs)**	**PV of CF of Merged Entity (Rs.Lakhs)**
1	175	0.870	152.25	400	348.00
2	200	0.756	151.20	450	340.20
3	320	0.658	210.56	525	345.45
4	340	0.572	194.48	590	337.45
5	350	0.497	173.95	620	308.14
			882.44		1679.27

PV of Cash Flows of Yes Ltd.after the forecast period

IV_5-$\frac{CFs-(1+g)}{keg}$=$\frac{350(1+0.05)}{Keg}$=$\frac{367.50}{0.10}$=3675 Lakhs

PV of TVs = 3675 lakhs x 0.497 = 1826.475 lakhs

PV of Cash Flows of Merged Entity after the forecast period

IV_5-$\frac{CFs-(1+g)}{keg}$=$\frac{620(1+0.06)}{0.15,0.06}$=$\frac{657.20}{0.09}$=7302.22 Lakhs

PV of TV5=Rs.73022.22 lakhs×0.497=Rs.3629.20 Lakhs

Value of Yes Ltd.

	Before merger (Rs. Lakhs)	**After merger (Rs. Lakhs)**
PV of CF(1-5 years)	882.440	1679.27
Add:PV of TVs	1826.475	3629.20
	2708.915	5308.47

(ii) Value of Acquisition

= Value of Merged Entity - Value of Yes Ltd.

= 5308.47 lakhs-₹2708.915 lakhs = ₹2599.555 lakhs

(iii) Gain to Shareholders of Yes Ltd.

Share of Yes Ltd.in merged entity=$\frac{5308.47\ Lakhs}{1.5}$=Rs.3538.98 Lakhs

Gain to shareholder = Share of Yes Ltd. in merged entity - Value of Yes Ltd. before merger = 3538.98 lakhs ₹2708.915 ₹830.065 lakhs

Q-95 The following information is provided relating to the acquiring company Efficient Ltd. and the target Company Healthy Ltd.

	Efficient Ltd.	Heathly Ltd.
No. of shares (F.V. Rs. 10 each)	10.00 lakhs	7.5 Lakhs
Market capitalization	500.00 lakhs	750.00 lakhs
P/E ratio (times)	10.00	5.00
Reserves and Surplus	300.00 lakhs	165.00 lakhs

Promoter's Holding (No. of shares)	4.75 lakhs	5.00 lakhs

Board of Directors of both the Companies have decided to give a fair deal to the shareholders and accordingly for swap ratio the weights are decided as 40%, 25% and 35% respectively for Earning, Book Value and Market Price of share of each company:

(i) Calculate the swap ratio and also calculate Promoter's holding % after acquisition.

(ii) What is the EPS of Efficient Ltd. after acquisition of Healthy Ltd.?

(iii) What is the expected market price per share and market capitalization of Efficient Ltd. after acquisition, assuming P/E ratio of Firm Efficient Ltd. remains unchanged.

(iv) Calculate free float market capitalization of the merged firm.

Ans-

Swap Ratio

	Efficient Ltd.	**Healthy Ltd.**
Market capitalization	500 lakhs	750 lakhs
No.of shares	10 Lakhs	7.5 Lakhs
Market Price per share	Rs.50	Rs.100
P/E Ratio	10	5
EPS	Rs.5	Rs.20
Profit	50 Lakhs	150 Lakhs
Share capital	Rs.100 Lakhs	Rs.75 Lakhs
Reserves and surplus	300 lakh	165 lakhs
Total	400 lakhs	240 lakhs
Book Value per share	40	32

(i) Calculation of Swap Ratio

EPS	1:4 i.e.	4.0 X 40%	1.6
Book value	1:0.8 i.e.	0.8 X 25%	0.2
Market price	1:2 i.e.	2.0 X 35%	0.7
		Total	2.5

Swap ratio is for every one share of Healthy Ltd., to issue 2.5 shares of Efficient Ltd. Hence, total no. of shares to be issued 7.5 lakh X 2.5 = 18.75 lakh shares.

Promoter's holding = 4.75 lakh shares + (5 X 2.5 = 12.5 lakh shares) = 17.25 lakh

i.e. Promoter's holding % is (17.25 lakh/28.75 lakh) X 100 = 60%.

Calculation of EPS, Market price, Market capitalization and free float market capitalization.

(ii) Total No. of shares 10 Lakh +18.75 Lakh=28.75 lakh total

Capital 100 lakh +187.5 Lakh =Rs.287.5 Lakh

EPS=$\frac{Total\ profit}{No.of\ shares}$=$\frac{50\ Lakhs+150\ lakhs}{28.75\ lakhs}$=$\frac{200}{28.75}$=6.956

(iii) Expected market price EPS 6.956 P/E 10 = Rs.69.56

Market capitalization = Rs.1,999.85 lakh = Rs.69.56 per share 28.75 lakh shares

(iv) Free float of market capitalization =Rs. 69.56 per share (28.75 lakh 40%) = Rs.799.94 lakhs

Q-96 Abhiman Ltd. is a subsidiary of Janam Ltd. and is acquiring Swabhiman Ltd. which is also a subsidiary of Janam Ltd. The following information is given :

	Abhiman Ltd.	**Swabhiman Ltd.**
% Shareholding of promoter	50%	60%

Share capital	Rs.200 lacs	100 lacs
Free Reserves and surplus		
Paid up value per share		
Free float market capitalization		
P/E Ratio (times		

Janam Ltd., is interested in doing justice to both companies. The following parameters have been assigned by the Board of Janam Ltd., for determining the swap ratio:

Book value	25%
Earnings per share	50%
Market price	25%
You are required to compute The swap ratio.	

The Book Value, Earning Per Share and Expected Market Price of Swabhiman Ltd., (assuming P/E Ratio of Abhiman remains the same and all assets and liabilities of Swabhiman Ltd. are taken over at book value.)

Ans-

	Abhiman Ltd.(Rs.)	**Swabhiman Ltd.(Rs.)**
Share capital	200 Lacs	100 Lacs
Free reserves & surplus	900 lacs	600 lacs
Total	1100 lacs	700 lacs
No.of shares	2 lacs	10 lacs
Book value for share	Rs.550	Rs.70
Promoters holding	50%	60%
Non promoters holding	50%	40%
Free float market capitalization (Public)	500 lacs	156 lacs
Total Market Cap	1000 lacs	390 lacs
No. of shares	2 lacs	10 lacs

Market Price	Rs.500	Rs.39
P/E ratio	10	4
EPS	Rs.50.00	Rs.9.75

Calculation of SWAP Ratio

Book Value	1:0.1273	0.1273 25%	0.031825
EPS	1:0.195	0.195 50%	0.097500
Market Price	1:0.078	0.078 25%	0.019500
Total			0.148825

(i) SWAP Ratio is 0.148825 shares of Abhiman Ltd. for every share of Swabhiman Ltd.

Total No. of shares to be issued = 10 lakh X 0.148825 = 148825 shares

(ii) Book value, EPS & Market Price.

Total No. shares = 200000+148825-348825

Total capital = 200 lakh + 148.825 lac = Rs.348.825 lac Reserves =

900 lac + Rs. 551.175 lac=Rs.1451.175 lac

Book Value per share=$\frac{348.825\ Lakhs+1457.175}{3.48825\ \ Lacs}$=Rs.516.02

Or Rs.516.02X0.148825=76.80

Or $\frac{Total\ capital}{No.of\ shares}$=$\frac{1100\ lakhs+700\ lakhs}{3.48825}$=516.02

EPS=$\frac{Total\ \ Profit}{No.of\ Shares}$=$\frac{100\ Lakhs+9.750\ lacs}{3.48825}$=56.62

or approx 56.62 * 0.148825 = Rs.8.43

Expected market price = Rs.56.62 PE Ratio =Rs. 56.62 × 10 = 566.20 or

566.2 * 0.148825 = Rs. 8 84.26

Q-97 The following information is provided relating to the acquiring company E Ltd., and the target company H Ltd:

Particulars	**E Ltd.(Rs.)**	**H.Ltd.(Rs.)**
Number of shares (Face value 10 each)	20 Lakhs	15 Lakhs
Market Capitalization	1000 Lakhs	1500 Lakhs
P/E Ratio (times)	10.00	5.00
Reserves and surplus in Rs.	600.00 Lakhs	330.00 Lakhs
Promoter's Holding (No. of shares)	9.50 Lakhs	10.00 lakhs

The Board of Directors of both the companies have decided to give a fair deal to the shareholders. Accordingly, the weights are decided as 40%, 25% and 35% respectively for earnings (EPS), book value and market price of share of each company for swap ratio.

Calculate the following:

(i) Market price per share, earnings per share and Book Value per share;

(ii) Swap ratio;

(iii) Promoter's holding percentage after acquisition;

(iv) EPS of E Ltd. after acquisitions of H Ltd;

(v) Expected market price per share and market capitalization of E Ltd.; after acquisition, assuming P/E ratio of E Ltd. remains unchanged; and

(vi) Free float market capitalization of the merged firm.

Ans-(i)

	E Ltd.	H Ltd.
Market capitalisation	1000 lakhs	1500 lakhs
No. of shares	20 lakhs	15 lakhs
Market Price per share	Rs.50	Rs.100
P/E ratio	10	5
EPS	Rs.5	Rs.20
Profit	Rs.100 lakh	Rs.300 lakh
Share capital	Rs.200 lakh	Rs.150 lakh
Reserves and surplus	Rs.600 lakh	Rs.330 lakh
Total	Rs.800 lakh	Rs.480 lakh
Book Value per share	Rs.40	Rs.32

(ii)Calculation of Swap Ratio

EPS	1:4 i.e.	4.0 X40%	1.6
Book Value	1:0:8 i.e.	0.8 X 25%	0.2
Market Price	1:2 i.e.	2.0 X35%	0.7
		Total	2.5

(ii) Swap ratio is for every one share of H Ltd., to issue 2.5 shares of E Ltd. Hence, total no. of shares to be issued 15 lakh X 2.5 = 37.50 lakh shares

(iii) Promoter's holding = 9.50 lakh shares + (10X 2.5 = 25 lakh shares) = 34.50 lakh i.e. Promoter's holding % is (34.50 lakh/57.50 lakh) X 100 = 60%.

(iv)Calulation of EPS after merger

Total No. of shares 20 lakhs +37.50 lakh=57.50 lakh

$$EPS=\frac{Total\ Profit}{No\ .of\ \ shares}=\frac{100\ Lakhs+300\ Lakhs}{57.50\ Lakhs}=\frac{400}{57.50}=6.956$$

(v) Calculation of market price and Market capitalization after merger

Expected market price	EPS 6.956 X P/E =Rs.69.56
Market capitalization	=69.56 per share X 57.50 Lakh shares
	=Rs.3,999.70 Lakh or Rs.4,000 Lakh

(vi) Free float of market capitalization =Rs.69.56 per share X (57.50 Lakh X40%) =Rs.1599.88 lakh

Q-98 The following information is relating to Fortune India Ltd. having two division, viz. Pharma Division and Fast Moving Consumer Goods Division (FMCG Division). Paid up share capital of Fortune India Ltd. is consisting of 3,000 Lakhs equity shares of Re. 1 each. Fortune India Ltd. decided to de-merge Pharma Division as Fortune Pharma Ltd. w.e.f. 1.4.2009. Details of Fortune India Ltd. as on 31.3.2009 and of Fortune Pharma Ltd. as on 1.4.2009 are given below:

Particulars	**Fortune Pharma Ltd.**	**Fortune India Ltd.**
Outside Liabilities		
Secured Loans	400 Lakh	3,000 lakhs
Unsecured Loans	2,400 Lakh	800 lakhs
Current Liabilities & Provisions	1,300 Lakh	21,200 lakhs
Asstes		
Fixed Assets	7,740 lakh	20,400 lakh
Investment	7,600 Lakh	12,300 lakh
Current Assets	8,800 lakh	30,200 lakh
Loans & Advances	900 lakh	7,300 lakh
Deffered tax/Misc Expenses	60 lakh	(200)lakh

Board of Directors of the Company have decided to issue necessary equity shares of Fortune Pharma Ltd. of Rs.. 1 each, without any consideration to the shareholders of Fortune India Ltd. For that

purpose following points are to be considered:

(a) Transfer of Liabilities & Assets at Book value.

(b) Estimated Profit for the year 2009-10 is Rs. 11,400 Lakh for Fortune India Ltd. & 1,470 lakhs for Fortune Pharma Ltd.

(c) Estimated Market Price of Fortune Pharma Ltd. is Rs.24.50 per share

(d) Average P/E Ratio of FMCG sector is 42 & Pharma sector is 25, which is to be expected for both the companies.

Calculate:

1. The Ratio in which shares of Fortune Pharma are to be issued to the shareholders of Fortune India Ltd.

2. Expected Market price of Fortune India (FMCG) Ltd.

3. Book Value per share of both the Companies immediately after Demerger

Ans-Shareholder's funds (Rs.lakhs)

Particulars	**Fortune India Ltd.**	**Fortune Pharma Ltd .**	**Fortune India (FMCG)Ltd.**
Assets	70,000	25,100	44,900
Outside Liabilities	25,000	4,100	20,900
Net worth	45,000	2,1000	24,000

1.Calculation of shares of fortune Pharma Ltd.to be issued to shareholders of fortune India Ltd.

Particulars	Fortune pharma Ltd.
Estimated Profit (Rs. In Lakhs)	1,470
Estimated market price (₹)	24.5
Estimated P/E	25
Estimated EPS (₹)	0.98
No. of shares lakhs	1,500

Hence, Ratio is 1 share of Fortune Pharma Ltd. for 2 shares of Fortune India Ltd. OR for 0.50 share Fortune Pharma Ltd. for 1 share of Fortune India Ltd.

2. Expected market price of Fortune India (FMCG) Ltd.

	Fortune India (FMCG) Ltd
Estimated Profit (in lakhs)	11,400
No. of equity shares (in lakhs)	3,000
Estimated EPS (₹)	3.8
Estimated P/E	42
Estimated market price (₹)	159.60

3. Book value per share

	Fortune Pharma Ltd	Fortune India (FMCG) Ltd
Net worth (in lakhs)	21,000	24,000
No. of shares (* in lakhs)	1,500	3,000
Book value of shares	Rs.14	Rs.8

Q-99 A Ltd. is studying the possible acquisition of B Ltd. by way of merger. The following data are available:

Firm	After-Tax earning	No. of equity shares	Market Price per share
A Ltd.	Rs.10,00,000	2,00,000	Rs.75
B Ltd.	Rs.3,00,000	50,000	Rs.60

(i) If the merger goes through by exchange of equity shares and the exchange ratio is set according to the current market prices, what is the new earnings per share for A Ltd.

(ii) B Ltd. wants to be sure that its earning per share is not diminished by the merger. What exchange ratio is relevant to achieve the objective?

Ans-(i) The current market price is the basis of exchange of equity shares, in the proposed merger, shareholders of B Ltd. will get only 40,000 shares in all or 4 shares of A Ltd. for every 5 shares held by them, i.e.

$=\frac{50,000\times60}{75}$=40,000

The total number of shares in A Ltd. will then be Rs.2,40,000 and, ignoring any synergistic effect, the profit will be Rs. 13,00,000. The new earning per share (EPS) of A Ltd. will be 5.42, i.e., Rs. 13,00,000/2,40,000.

The present earnings per share of B Ltd. is ₹6/- (3,00,000 50,000) and that of A Ltd. Is Rs 5/-, i.e., 10,00,000 2,00,000. If B Ltd. wants to ensure that, even after merger, the earning per share of its shareholders should remain unaffected, then the exchange ratio will be 6 shares for every 5 shares. The total number of shares of A Ltd. that will produce 3,00,000 profit is 60,000, (3,00,000 ÷ 5), to be distributed among, shareholders of B Ltd., giving a ratio of 6 shares in A for 5 shares in B.

Proof:

The shareholders of B Ltd. will get in all 60,000 share for 50,000 shares. It means after merger, their earning per share will be $=\frac{13,00,000}{2,60,000}$

In all they will get Rs.3,00,000,i.e.60,000×5 as before

Q-100 Simpson Ltd. is considering a merger with Wilson Ltd. The data below are in the hands of both Board of Directors. The issue at hand is how many shares of Simpson should be exchanged for Wilson Ltd. Both boards are considering three possibilities 20,000, 25,000 and 30,000 shares. You are required to construct a table demonstrating the potential impact of each scheme on each set of shareholders:

		Simpson Ltd.	**Wilson Ltd.**	**Combined Post merger Firm 'A'**
1.	Current earnings per year	2,00,000	1,00,000	3,50,000
2.	Shares outstanding	50,000	10,000	?
3.	Earnings per share (₹) (1÷2)	4	10	?
4.	Price per share(Rs.)	40	100	?
5.	Price-earnings ratio [4+3]	10	10	
6.	Value of firm	20,00,000	10,00,000	
7.	Expected Annual growth rate in earnings in foreseeable future	0	0	

Ans-The following table demonstrates the potential impact of the possible schemes, on each set of shareholders:

Number of Simpson Ltd.'s shares	**Exchange ratio [(1)/10,000 shares**	**Number of Simpson Ltd.'s shares**	**Fraction of Simpson Ltd. (Post merger)**	**Value of shares owned by Wilson**	**Fraction of Simpson Ltd. (combined**	**Value of shares owned by Simpson**

issued to shareholders of Wilson Ltd.	**of Wilson Ltd.]**	**outstanding after merger [50,000+(1)]**	**owned by Wilson Ltd.'s shareholders [(1)/(3)]**	**Ltd.'s shareholders [(4)x 35,00,000]**	**Post-merger owned by Simpson Ltd.'s share-holders [50,000/(3)]**	**Ltd.'s shareholders [(6) x 35,00,000]**
(1)	(2)	(3)	(4)	(5)	(6)	(7)
20,000	2	70,000	2/7	10,00,000	5/7	25,00,000
25,000	2.5	75,000	1/3	11,66,667	2/3	23,33,333
30,000	3	80,000	3/8	13,12,500	5/8	21,87,500