STRATEGIC PERFORMANCE MANAGEMENT AND BUSINESS VALUATION

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

The figures in the margin on the right side indicate full marks.
Where considered necessary, suitable assumptions may be made and
clearly indicated in the answer.

SECTION – A : STRATEGIC PERFORMANCE MANAGEMENT

Answer to Question No. 1 and 5 are compulsory; answer any two from Question No. 2, 3 & 4.

1. (a)

Sl. No.	Answer	Justification
(i)	(b)	Justification Trend analysis, also known as the pyramid method, is an extension of horizontal analysis. In this case the comparison of the operational results and financial position is made over a number of years. The simple perspective is that unless the trend of accounting over a sufficient number of years is made, the usefulness of the financial information is moot.
(ii)	(a)	Justification Gartner's defines Vendor Management as "a discipline that enables organizations to control costs, drive service excellence and mitigate risks to gain increased value from their vendors throughout the deal life cycle." Following important aspects can be listed; • select the right vendors; • categorize vendors to ensure the right contract, metrics and relationship; • determine the ideal number of vendors; • mitigate risk when using vendors; and • establish a vendor management organization that best fits the enterprise.
(iii)	(b)	Justification Demand based pricing – pricing is set on the basis of consumer preference and the consumer perception. Thus if seller wishes to sell more he must reduce the price of his product, and if he wants a good price for his product, he could sell only a limited quantity of his good.

		There are two types of demand based pricing namely *perceived value pricing and differential pricing*.
(iv)	(c)	<u>Justification</u> Using Altman's Multiple Discriminant Function, this is as follows Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 0 .999 X5 (this is for a publicly held manufacturing firms with more than $ 1 million of net worth values) Where $X_1 = \frac{Working\ Capital}{Total\ assets}$ $X_2 = \frac{Retained\ earnings}{Total\ assets}$ $X_3 = \frac{Earnings\ before\ Interest\ and\ Taxes}{Total\ assets}$ $X_4 = \frac{Market\ Value\ of\ equity}{Book\ Value\ of\ total\ liabilities}$ $X_5 = \frac{Sales}{Total\ assets}$ Z = Overall Index For Private Firms: The original formula to calculate Altman z-score is modified to fit in case of private firms, and the business ratios used in case of this are: Altman's Multiple Discriminant Function, Z score can be calculated by using the following formula: $Z' = (0.717 \times X_1) + (0.847 \times X_2) + (3.107 \times X_3) + (0.420 \times X_4) + (0.998 \times X_5)$ This Sum Asks for Calculation of Z Score of S & Co. Ltd. which is a Private Company. Thus this modification is to be used. To calculate the Z-score using Altman's Multiple Discriminant Function, we need to assign weights to each ratio and calculate the sum. The weights commonly used by Altman for private company are as follows: Z1 = 0.717 × (Working Capital to Total Assets) Z2 = 0.847 × (Retained Earnings to Total Assets) Z3 = 3.107 × (EBIT to Total Assets) Z4 = 0.420 × (Book Value of Equity to Book Value of Total Debt) Z5 = 0.998 × (Sales to Total Assets) Now, we can substitute the given ratio values into the equation:

		Z1 = 0.717 × 0.250 = 0.17925 Z2 = 0.847 × 0.50 = 0.4235 Z3 = 3.107 × 0.19 = 0.59033 Z4 = 0.420 × 1.65 = 0.693 Z5 = 0.998 × 3 = 2.994 Finally, we can calculate the Z-score by summing up these values: Z-score = Z1 + Z2 + Z3 + Z4 + Z5 = 0.17925 + 0.4235 + 0.59033 + 0.693 + 2.994 = 4.88008 Therefore, the Z-score for S & Co. Ltd using Altman's Multiple Discriminant Function is approximately 4.88008.
(v)	(a)	With price discrimination, $P_1 = 300 – 2Q_1$ $TR_1 = 300Q_1 – 2Q_1^2$ $MR_1 = 300\text{-}4Q_1$ $P_2=200\text{-}2Q_2$ $TR_2 = 200Q_2 – 2Q_2^2$ $MR_2 = 200\text{-}4Q_2$ To maximize profits, the discriminating monopolist should equate $MR_1 = MC$ and $MR_2 = MC$ So, $300\text{-}4Q_1 = 50$ $Q_1 =62.5$ Similarly, $200\text{-}4Q_2 = 50$ So, $Q_2 = 37.5$ Prices in the sub-markets are: $P_1 = 300 – (2\times62.5)$ =175 $P_2=200\text{-}(2\times37.5)$ = 125 $Q_1 = 62.5$; $P_1 = 175$ $Q_2 = 37.5$; $P_1 = 125$ Profit of the discriminating monopolist $= (TR_1 + TR_2) – TC$ $= (62.5 \times 175 + 37.5 \times 125) – 5000$ =₹10,625

2. (a) The internal factors affecting pricing decision of a firm are:

1. Cost Structure: A firm's cost structure, which includes both variable and fixed costs, is one of the primary internal factors influencing pricing decisions. Variable costs typically increase dramatically as production increases, impacting profit margins, whereas fixed costs remain relatively constant. Companies must balance cost structure with customer demand in order to price competitively.
2. Financial Health: The financial health of a company influences pricing decisions, as companies that are financially secure may be more able to discount prices or provide options and bundles in order to attract more customers. Poor financial health may mean that prices must be raised in order to meet income goals, but this could potentially alienate customers and decrease sales.
3. Brand Image: Companies often make pricing decisions based on the image that they want to project with their brands. For example, luxury firms tend to have higher prices than low-cost brands, which make decisions regarding promotion and discounting based on their perceived value to customers.
4. Strategic Focus: Companies often make decisions about the prices they charge for their products or services based on their strategic focus. For example, a company looking to gain market share may choose to lower prices in order to attract customers, whereas a company looking to maximize profits may increase prices in order to maximize return on investment.
5. Competitors' Prices: Price considerations for firms also include understanding and reacting to competitors' pricing strategies. This involves looking at what goods are charged for on the market by competitors, as well as understanding what other marketing strategies they are using to draw customers in. Companies must consider the overall picture when establishing prices in order to remain competitive.

(b) Du Pont Analysis – 5 Component Analysis:

This is presented as;

ROE = Operational Efficiency × Interest Burden on Earnings × Tax burden on earnings × Asset Utilization× equity multiplier (Financial leverage).

The impact of operational efficiency (measured in terms of net margin), asset utilization (measured in terms of asset turnover) and financial leverage (measured in terms of the equity multiplier) is comprehended through the 3 component analysis discussed in the previous section. Two additional aspects; the effect of interest on earning and the effect of tax on earnings, which are also the components of ROE, are deliberated in the 5 – component analysis.

The above identity is represented through five ratios, given below

$$\text{ROE} = \frac{\text{EBIT}}{\text{Sales}} \times \frac{\text{EBT}}{\text{EBIT}} \times \frac{\text{EAT}}{\text{EBT}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Equity}}$$

- (EBIT ÷ Sales) - this is approximation of the net margin. Here earnings before interest and taxed (EBIT) is used as an approximation of the net profit, used in the previous 3 –component framework. EBIT is calculated by adjusting net profit This shows the operational efficiency of the firm.
- (EBT÷EBIT)– this component is an addition in the 5 – component framework. Earnings before taxes (EBT) is mapped against the EBIT. This component shows the impact of interest burden on the earnings of the firm. if this ratio is one, it implies zero interest burden which further implies that there is no debt in the capital structure (all equity firm).
- (EAT÷EBT) –this is the third component in the 5 – component framework. Earnings after taxes (EAT) are mapped against EBT. This component shows the impact of tax burden on the earnings of the firm.
- (Sales ÷ Total Assets) - this component was previously dealt with, in the discourse on the 3 component framework which was taken up in the previous section. This shows the return generated in terms of the asset base of the firm. The issue of asset utilization is addressed in this ratio.
- (Total Assets ÷ Equity) –this component was also previously dealt with, in the discourse on the 3 component framework which was taken up in the previous section. This ratio is referred as the equity multiplier and is an approximation of the financial leverage. If the ratio is one, it implies that all of the assets are sourced from equity and there is no debt component.

$$\textbf{ROE} = \frac{\textbf{NET INCOME}}{\textbf{SHAREHOLDER'S EQUITY}} \times \textbf{100} = \frac{4125}{10250} \times \textbf{100} = \textbf{40.24\%}$$

$$\textbf{DuPont ROE} = \frac{\textbf{EBIT}}{\textbf{Sales}} \times \frac{\textbf{EBT}}{\textbf{EBIT}} \times \frac{\textbf{EAT}}{\textbf{EBT}} \times \frac{\textbf{Sales}}{\textbf{Total Assets}} \times \frac{\textbf{Total Assets}}{\textbf{Equity}}$$

- $\frac{\text{EBIT}}{\text{Sales}} = \frac{6425}{17750} = \mathbf{0.361971831}$[1]
  [Where, net income (4125) + interest (50) +tax (2250) = EBIT (6425)]
- $\frac{\text{EBT}}{\text{EBIT}} = \frac{6375}{6425} = \mathbf{0.992217899}$
  [EBT (6375) = EBIT (6425) - interest (50)]
- $\frac{\text{EAT}}{\text{EBT}} = \frac{4125}{6375} = \mathbf{0.647058824}$
  [EAT (4125) = EBT (6375) – tax (2250)]
- $\frac{\text{Sales}}{\text{Total Assets}} = \frac{17750}{18125} = \mathbf{0.979310345}$
- $\frac{\text{Total Assets}}{\text{Equity}} = \frac{18125}{10250} = \mathbf{1.768292683}$

Thus, DuPont ROE = **0.361971831× 0.992217899× 0.647058824× 0.979310345× 1.768292683 = 0.402439024 = 40.24%**

[1]Approximation is avoided as otherwise it would not tally with the ROI calculated in the first step.

The following inferences may be drawn and presented to Mr. Hardik:

1. $\frac{\text{EBIT}}{\text{Sales}}$, which measures the operational efficiency is satisfactory at 36.20% approximately.
2. The EBT and the EBIT are almost same (as the ratio, $\frac{\text{EBT}}{\text{EBIT}}$, is 0.99 implying that the interest burden is minimal. This is also reflected in the information given which shows that long term debt in the capital structure is very low, only ₹ 375 while the equity is ₹ 10250.
3. Tax burden is significant as the ratio $\frac{\text{EAT}}{\text{EBT}}$ indicates. The ratio stands at 64.71% (approximately) implying that a significant portion of the income (35.29%) is the tax burden.
4. Assets are managed efficiently as the $\frac{\text{Sales}}{\text{Total Assets}}$ indicates.
5. Equity multiplier of 1.77 (approximately) indicates that the firm depends primarily of equity for its financing. This is also represented in the low long term loan (₹ 375) in the capital structure of Artex LLP.

3. (a) According to Altmans model, the equation of z score, is as follows:

$Z=0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$

Here, X_1 = Working Capital / Total Assets

Working Capital = Current Assets – Current Liabilities

= ₹ (150000 + 75000) - ₹ 550000 = (₹ 325000)

Total Assets = 1450000 – 25000 = ₹1425000

So, X_1 = (325000) / 1425000 = -0.2281 = -22.81%

X_2 = Retained Earnings / Total Assets = 175000 / 1425000 = 0.1228 = 12.28%

X_3 = Earnings before Interest and Tax (EBIT)/ Total Assets = 88000 / 1425000 = 0.0617 = 6.17%

Note: Calculation of EBIT

Total earnings available to Equity Shareholders		16,000
[DPS/(1-DP Ratio)]×No. of equity shares, i.e. [₹ 0.40/0.50×20,000]		
Add: tax @50%, i.e. 50/50×16000		16,000
Earnings before Tax (EBT)		32,000
Add: Interest added back:		
Debenture Interest = 3,00,000×12%	36,000	
Interest on long-term loan = 2,00,000×10%	20,000	56,000
EBIT		88,000

X_4 = MV of Equity/ BV of Total Debt = 240000 / 1050000 = 0.2286 = 22.86%

Note: Market value of each equity share =Price earnings ratio × EPS= 15×0.40/0.50 = ₹12

So, total market value of equity = ₹12×20,000 = ₹240000

BV of total debt = ₹ (3,00,000+2,00,000+5,50,000) = ₹10,50,000

X_5 = Sales/ Total Assets = 2950000 / 1425000 = 2.07 times

Putting the values of all variables as above in he discriminant function, we get

Z= 0.012×(-22.81) + (0.014×12.28) + (0.033×6.17) + (0.006×22.86) + (0.999×2.07)

Or, Z=2.308

The Z score of the firm falls in the grey zone. Hence, further analysis is required for identifying the bankruptcy status of the firm.

(b) **(i)** A strategy map is a powerful management tools that describes the key business objectives on a single page. The Strategy Map describes the performance enablers and drivers from learning & growth and internal process perspectives that will deliver successful outcomes within the customer and financial perspectives. The Balanced Scorecard Institute (BSI), an educational institute of international repute, developed the Nine Steps to Success™ which is a comprehensive approach to developing a strategic planning and management system based on the BSC. Strategy Mapping is an important step in this model. This is a cause-and-effect linkage is developed between each strategic objective. This creates a "value chain" of how customers and stakeholders are satisfied by the organization's products and services. Organizational strategy maps – graphic representation of cause-and-effect relationships of objectives across the four perspectives – are developed.

Thus it may be stated that the statement is accurate. The Balanced Score Card (BSC) is a performance management tool that companies use to align business activities to the vision and strategy of the organisation. A strategy map is a visual representation of the BSC, showing the cause-and-effect relationships between strategic objectives. It captures the metrics that help the organisation to achieve its goals, and it is typically used in conjunction with a financial score card. The strategy map visually outlines the key elements of the BSC, providing a more comprehensive view of an organisation's strategic objectives and how it intends to achieve them.

(ii) The ends-ways-means model of traditional strategic planning is a useful tool for organizations to plan and set goals for the future. It is a comprehensive approach

that allows organizations to Clarify their vision and mission statements, identify issues, set objectives, develop strategies, allocate resources, and evaluate progress.

Ends: The 'ends' component of the model is the ultimate desired outcome - the ideal situation that the organization wishes to achieve. These goals provide the direction for the organization and are generally defined in terms of long-term targets that cannot be achieved within the immediate future.

Ways: The 'ways' component of the model is focused on how the organization will reach its goals. This involves identifying strategies and activities that will take the organization in the right direction and result in the desired 'ends'.

Means: The 'means' component of the model is focused on how the organization will put its plans into action. This involves decisions about the resources necessary to implement the strategies and activities identified in the 'ways' component.

Overall, the ends-ways-means model of traditional strategic planning provides a useful tool for organizations to plan and set goals for the future. However, some limitations must also be acknowledged. It can be difficult to accurately assess the resources required to implement a strategy, and project costs can often quickly spiral out of control if not monitored closely. Additionally, the model only provides a limited perspective on the environment in which the strategies will be implemented. As such, its ability to account for unpredictable changes or unanticipated opportunities is limited. Finally, an organization that adheres too closely to the model can become rigid and inflexible in responding to developments in the external environment. It is also important to note that the ends-ways-means model of traditional strategic planning should be seen as the beginning, rather than the end, of a strategic planning process. Regardless of the model adopted, it is essential that an organization continuously reviews its goals and strategies and evaluates its progress in order to maximize success.

4. (a) It is important to note that the over the two years the percentage of profit as to sales is same

	Year 1	**Year 2**
Percentage of net profit to sales = $\frac{Net\ Profit}{Sales\ .} \times 100$	10%	10%

But in absolute term, net profit has grown from ₹ 7000 to ₹ 10000.

It is also important to note that gross profit margin has increased by 5% and from ₹ 28000 to ₹ 45000 which is higher than the increase in net profit.

	Year 1	**Year 2**

Percentage of gross profit to sales = $\frac{Gross\ Profit}{Sales.} \times 100$	$\frac{28000}{70000} \times 100$ $= 40\%$	$\frac{45000}{100000} \times 100$ $= 45\%$

To have insight of the nature of profit and profit growth the following types of financial statement analysis may be advocated;

- **Common size statement** - Common-size income statements present each line item on the income statement as a percentage of sales. The standardization of each item removes the effect of company size and facilitates financial statement analysis, as the data can be used to conduct time-series (across time periods) and cross-sectional (across companies) analysis. While common-size income statements present most items as a percentage of sales, it is more appropriate to present income taxes as a percentage of pre-tax income. This ratio is known as the company's effective tax rate. In cross-sectional analysis, effective tax rates are compared across companies and sources of any differences are analyzed in detail.
- **Trend analysis** - Trend analysis provides important information about a company's historical performance. It can also offer assistance in forecasting the financial performance of a company. When looking for trends over time, horizontal common-size financial statements are often prepared. Rupee values of accounts are divided by their base-year values to determine their common-size values. Horizontal common-size statements can also help identify structural changes in the business.

Vertical Common-Size Income Statement for Pinacle Star Ltd.

PARTUCULARS	YEAR 1		YEAR 2	
	₹	%	₹	%
Turnover	70,000	100	1,00,000	100
Less: Cost of sales	42,000	60	55,000	55
Gross profit	28,000	40	45,000	45
Less: Expenses	21,000	30	35,000	35
Net Profit	7,000	10	10,000	10

Thus it is seen that though the net profit as a percentage of turnover has remained same, the cost of sales has gone down by 5% while expenses are on the rise noted as 5% of the previous year.

The three main purpose of preparing the common size income statement are.

1. Comparison of Financial Performance: By presenting each line item as a percentage of total sales or revenue, a common-size income statement allows for easy comparison of financial performance across different periods or between different

companies. This makes it easier to identify trends, patterns, and areas of improvement.

2. Identification of Cost Structure: Analyzing the common-size income statement helps in understanding the cost structure of a business. It allows you to see the relative proportion of various expenses to sales or revenue. This information can be valuable for cost control and efficiency improvement initiatives. For example, if the cost of goods sold (COGS) is significantly higher than industry averages, it may indicate inefficiencies in the production process or purchasing strategies.
3. Evaluation of Profitability: The common-size income statement provides insights into the profitability of a business. By comparing the percentages of operating income, net income, and other profitability measures to total sales or revenue, it becomes easier to assess the company's ability to generate profits. This analysis helps identify areas where profitability may be improving or declining over time.

Trend analysis can also be done for the data given but would not be highly recommended as only two years data is given.

(b) **(i)** Basel I and Basel II are international regulatory frameworks developed by the Basel Committee on Banking Supervision (BCBS) to establish minimum capital requirements for banks and improve risk management practices. Basel I framework was introduced in 1988 by the Basel Committee on Banking Supervision (BCBS). While Basel II framework was developed as an improvement over Basel I and was released in June 2004 by the BCBS. Below is detailed comparison between Basel I and Basel II provisions:

1. Scope:
   - Basel I: Basel I focused primarily on credit risk. It introduced a standardized approach to determine the minimum capital requirements for credit risk.
   - Basel II: Basel II expanded the scope and covered three types of risks: credit risk, operational risk, and market risk. It introduced more sophisticated approaches for calculating capital requirements for each risk category.
2. Risk Categories:
   - Basel I: Basel I considered only credit risk, which is the risk of borrower default or failure to fulfil contractual obligations.
   - Basel II: Basel II addressed credit risk (default risk), operational risk (risks arising from internal processes, systems, and external events),

and market risk (risks arising from changes in market conditions, such as interest rates, foreign exchange rates, and equity prices).

3. Calculation of Capital Requirements:
   - Basel I: Basel I adopted a simple risk-weighted assets (RWA) approach to determine capital requirements. It categorized assets into broad risk categories and assigned fixed risk weights to each category. For example, commercial loans had a risk weight of 100%.
   - Basel II: Basel II introduced three approaches for calculating capital requirements: the standardized approach, the internal ratings-based (IRB) approach, and the advanced IRB approach. These approaches aimed to align capital requirements more closely with the actual risk profile of banks by considering factors like credit ratings, collateral, and probability of default.
4. Treatment of Operational Risk:
   - Basel I: Basel I did not explicitly address operational risk. It was not considered in the capital adequacy calculations.
   - Basel II: Basel II recognized operational risk as a distinct category and introduced specific methodologies to calculate capital requirements for operational risk. Banks had the option to use the basic indicator approach, the standardized approach, or advanced measurement approaches to measure and allocate capital for operational risk.
5. Supervisory Review:
   - Basel I: Basel I did not emphasize a formalized supervisory review process.
   - Basel II: Basel II introduced a comprehensive supervisory review process to ensure banks had adequate capital and risk management systems. This process involved regular assessments by supervisors, stress testing, and more robust disclosure requirements.

Overall, Basel II built upon the foundation laid by Basel I by expanding the risk coverage, introducing more sophisticated capital calculation approaches, and incorporating a formal supervisory review process. The shift from Basel I to Basel II reflected an increased focus on risk sensitivity and enhancing risk management practices in the banking sector.

(b) (ii) Measuring corporate failure is a complex task that involves evaluating various aspects of a company's performance and financial health. Several methods have

been developed over the years to assess corporate failure, each with its strengths and limitations. Here's a critical assessment of some common methods:

1. Financial Ratio Analysis: Financial ratio analysis involves examining a company's financial statements to calculate ratios that indicate its liquidity, profitability, solvency, and efficiency. While ratio analysis provides valuable insights into a company's financial performance, it has limitations. Ratios can be influenced by accounting practices and may not capture the complete picture of a company's operations or external factors affecting its performance.
2. Altman's Z-Score: Developed by Edward Altman, the Z-Score is a formula that combines multiple financial ratios to predict the likelihood of corporate bankruptcy. While the Z-Score has been widely used and proven effective in some cases, it has its drawbacks. The model's assumptions may not be valid for certain industries or geographical regions, and it relies solely on financial data, neglecting other crucial factors like market dynamics, management quality, and industry trends.
3. Credit Rating Agencies: Credit rating agencies assess the creditworthiness of companies and assign ratings based on their analysis. These ratings are intended to reflect the likelihood of default. While credit ratings provide an independent evaluation, they have faced criticism for their role in the 2008 financial crisis. They are also subject to conflicts of interest and can be slow to react to changing circumstances.
4. Market-Based Measures: Market-based measures evaluate a company's performance by examining its stock price, market capitalization, and other market indicators. Market-based measures are forward-looking, reflecting investors' expectations, and can capture qualitative factors. However, they can be volatile, influenced by market sentiment, and subject to short-term fluctuations unrelated to a company's fundamental health.
5. Qualitative Assessment: Qualitative methods involve assessing non-financial factors such as management quality, corporate governance, competitive positioning, and industry trends. While qualitative assessment provides a holistic view of a company's operations, it is subjective and prone to biases. Additionally, it can be

The Altman Z-Score is the **most important method** for predicting corporate failure because it provides a quantitative framework to assess the financial distress and

bankruptcy risk of companies. Here are the reasons why the Altman Z-Score is considered significant:

1. *Established Track Record*: The Altman Z-Score was developed by Edward Altman in 1968 and has been widely used and studied since then. It has stood the test of time and has been applied to various industries and geographical regions, gaining credibility and recognition.
2. *Predictive Accuracy*: The Altman Z-Score has demonstrated a reasonably high predictive accuracy in identifying financially distressed and bankrupt companies. The formula combines multiple financial ratios, including profitability, liquidity, leverage, solvency, and activity, to generate a single score. Different score ranges indicate the likelihood of financial distress or bankruptcy, allowing investors, creditors, and analysts to make informed decisions.
3. *Easy Calculation and Interpretation*: The Z-Score formula is relatively straightforward and can be calculated using readily available financial data from a company's financial statements. The resulting score can be compared to predefined thresholds to determine the level of financial risk. The higher the Z-Score, the lower the risk of bankruptcy, and vice versa. This simplicity makes it accessible and practical for financial analysis.
4. *Broad Applicability*: The Altman Z-Score is applicable across various industries and can be used for both public and private companies. While the original formula was designed for manufacturing companies, variations of the Z-Score have been developed for different sectors, making it adaptable and applicable in different contexts.
5. *Early Warning System*: One of the key advantages of the Altman Z-Score is its ability to provide an early warning system for potential financial distress. By identifying companies at risk of bankruptcy in advance, stakeholders can take proactive measures such as restructuring, renegotiating debts, or implementing turnaround strategies.

Despite its advantages, it's important to note that the Altman Z-Score is not infallible and has its limitations. It primarily relies on historical financial data and may not capture all the nuances of a company's operations or external market dynamics. Therefore, it should be used in conjunction with other qualitative and quantitative measures to form a comprehensive assessment of corporate failure risk.

The Altman Z-Score is a mathematical model developed by Edward Altman in 1968 that uses financial ratios to predict the likelihood of a company going bankrupt

within two years. It is widely used in financial analysis and has gained prominence due to its accuracy and simplicity.

Since its original development in 1968, the Altman Z-Score has undergone several developments and modifications to enhance its effectiveness in predicting corporate failure. Here are some notable developments of the Altman Z-Score:

1. Altman Z"-Score: In 1983, Altman introduced an updated version of the Z-Score called the Z"-Score. This modification was specifically designed for non-manufacturing companies and incorporated different financial ratios than the original model. The Z"-Score was developed based on a sample of publicly traded service companies and has shown effectiveness in predicting financial distress in non-manufacturing industries.
2. Altman ZETA Model: In 1993, Altman introduced the ZETA (Z-Score Expanded Trend Analysis) model. The ZETA model expanded on the original Z-Score by incorporating additional factors, such as sales growth, stability of earnings, and R&D intensity. This model aimed to improve the predictive accuracy of the Z-Score by considering the impact of these additional variables on a company's financial health.
3. Altman Z-Metrics: In 2002, Altman and Sabato introduced the concept of Z-Metrics, which extended the Z-Score approach to predict various corporate outcomes beyond bankruptcy. The Z-Metrics framework includes models for predicting financial distress, debt restructuring, and corporate governance failures. This development broadened the applicability of the Z-Score methodology to assess different forms of corporate failure.

The Altman Z-Score is well accepted for several reasons:

1. Historical Validity: The Altman Z-Score has been extensively tested and validated over time using large samples of companies. Its accuracy in predicting corporate failure has been supported by numerous empirical studies.
2. Simplicity: The model uses readily available financial data, making it easy to calculate and understand. This simplicity allows analysts, investors, and researchers to apply it consistently across different companies and industries.
3. Universality: The Altman Z-Score is applicable to companies in various sectors and geographical regions, making it a versatile tool for assessing corporate distress across different contexts.
4. Early Warning Signals: By predicting financial distress up to two years in advance, the Altman Z-Score provides an early warning system for investors,

lenders, and other stakeholders. This allows for proactive measures to be taken to mitigate risks or explore potential turnaround strategies.

5. Practicality: The Altman Z-Score can be used for both public and private companies, aiding decision-making processes for investors, lenders, and creditors.

However, it's worth noting that the Altman Z-Score has certain limitations. It assumes that financial ratios remain stable and may be less effective for industries with different capital structures or business models. Additionally, it is a static model that does not consider qualitative factors such as industry trends, management competence, or market dynamics, which can also impact a company's financial health.

Overall, the Altman Z-Score is widely accepted due to its historical validity, simplicity, universality, early warning capabilities, and practicality. It serves as a useful tool for assessing corporate failure and is often employed alongside other qualitative and quantitative measures for a comprehensive analysis.

5. (i) The misfortune faced by Palm Inc. can be attributed to several key risks**:**

1. *Inadequate testing and manufacturing timeline*: Palm's decision to rush the launch of the m500 line without allowing sufficient time for testing and manufacturing proved to be a critical risk. This led to production delays, snags, and the inability to ship the new model in volume within the promised timeframe. This delay resulted in missed sales opportunities and customers opting to wait for the new model, contributing to a decline in sales of Palm's existing devices.
2. *Accumulation of excess inventory*: Due to the production delays and customers' decision to wait for the new model, Palm faced the risk of accumulating excess inventory of their older products. As a result, they had to write off a significant amount of excess inventory, amounting to $300 million. This write-off had a severe financial impact on the company, leading to a net loss and further exacerbating their financial woes.
3. *Financial implications and stock price decline*: The combination of missed sales, financial losses, and the write-off of excess inventory had a substantial negative impact on Palm's financial performance. The company experienced a net loss of $392 million for the fiscal quarter, compared to a profit in the previous year. Consequently, Palm's stock price plummeted, leading to a collapse of an acquisition deal worth $264 million, which was essential for the company's strategic plans.
4. *Competitive pressure and missed opportunities*: Palm's misfortunes provided an opportunity for its competitors, such as RIM (BlackBerry) and Microsoft, to

capitalize on the situation. The delays and missteps allowed competitors to gain market share and increase their efforts to challenge Palm's position in the hand-held computer market. This increased competition further impacted Palm's ability to recover from its setbacks.

In summary, the main risk factors that caused misfortune for Palm Inc. were *inadequate testing* and *manufacturing timelines*, *the accumulation of excess inventory*, *financial implications resulting in stock price decline*, and *increased competition from rivals*. These risks collectively contributed to the significant challenges faced by Palm and its subsequent decline in the market.

(ii) Some crucial strategic decisions and related action points on behalf of the management of Palm Inc. may be represented in the below mentioned lines.

1. Improve Product Development and Testing Process:
   - Allocate sufficient time for thorough testing and quality assurance before launching new products.
   - Implement a structured and comprehensive product development process to identify and address potential issues and risks.
   - Establish a clear timeline for product development, including testing and manufacturing, to avoid rushed launches.
2. Enhance Supply Chain Management:
   - Strengthen relationships with key suppliers and manufacturers to ensure timely production and delivery of new products.
   - Improve forecasting and demand planning to minimize excess inventory and avoid write-offs.
   - Implement effective inventory management systems to monitor and control inventory levels.
3. Market Research and Customer Insights:
   - Conduct regular market research and customer surveys to gain insights into evolving customer preferences and needs.
   - Use customer feedback to guide product development and prioritize features that align with market demands.
   - Stay updated on competitors' strategies and offerings to anticipate market trends and respond effectively.
4. Effective Communication and Expectation Management:
   - Foster transparent communication within the organization, ensuring that accurate information flows between management and different departments.
   - Set realistic expectations with customers, investors, and stakeholders regarding product launches, timelines, and potential challenges.

- Provide regular updates on product development progress to manage customer expectations and minimize the impact of delays.

5. Strengthen Financial Management:
   - Implement robust financial planning and risk management processes to identify and mitigate potential financial risks.
   - Diversify revenue streams and reduce dependency on specific product lines to enhance financial stability.
   - Regularly monitor key financial indicators and performance metrics to identify potential issues early on.

Action Points:

1. Establish a cross-functional team dedicated to product development and testing, with clear roles and responsibilities assigned.
2. Implement a comprehensive product development lifecycle that includes thorough testing and quality assurance stages.
3. Strengthen partnerships with suppliers and manufacturers through strategic collaborations and long-term agreements.
4. Invest in advanced demand forecasting and inventory management systems to optimize inventory levels and minimize write-offs.
5. Conduct regular market research and customer surveys to gather insights for product development and improvement.
6. Develop a clear and transparent communication plan to keep customers, stakeholders, and employees informed about product launches and potential delays.
7. Conduct regular financial reviews and risk assessments to identify potential financial risks and take appropriate measures to mitigate them.
8. Explore diversification opportunities and invest in research and development to expand the product portfolio and reduce reliance on a single product line.
9. Implement robust financial monitoring systems and conduct regular financial reviews to ensure timely identification of any adverse trends or issues.

By implementing these strategic decisions and action points, Palm Inc. could have aimed to avoid the unfortunate results experienced in the past and enhance their future prospects by fostering improved product development, supply chain management, customer insights, communication, and financial stability.

SECTION – B : BUSINESS VALUATION

Answer to Question No. 6 and 10 are compulsory; answer any two from Question No. 7, 8 & 9.

6. (a)

Sl. No.	Answer	Justification
(i)	(b)	Poison puts means that if the acquirer takes over the target, it would need to raise a substantial amount of cash to refinance the target's debt.
(ii)	(a)	In Market Approach, EV-EBITDA multiple of the peer groups is multiplied by the projected EBITDA of the company being valued to arrive at the value of the company.
(iii)	(b)	This is the case of external reconstruction. External reconstruction means where the company goes into liquidation, to form a new company.
(iv)	(c)	Market Value Added (MVA)= Market Capitalization – Invested equity capital $24 = 0.5x\ Market\ Price - 100$ $124 = 0.5x\ Market\ Price$ $Market\ Price = \frac{124}{0.5}$ $Market\ Price =$ ₹ 248
(v)	(b)	FCFF is given by: PAT + Depreciation – Change in Working Capital – Capital Expenditure

Sales – Costs - Depreciation	1,00,000
Less: Operating Expenses	75,000
Less: Depreciation	20,000
Profit Before Tax	5,000
Less: Tax	1,750
PAT	3,250
Add: Depreciation	20,000
Less: Change in working capital	1,000
Less: Change in capital spending	10,000
Free Cash Flow to Firm (FCFF)	12,250

7. a) "Asset reconstruction" means acquisition (by any asset reconstruction company) of any right or interest of any bank or financial institution in any financial assistance for the purpose of realization of such financial assistance.

Asset reconstruction is the activity of converting a bad or non-performing asset into performing asset. The process of asset reconstruction involves several steps including purchasing of bad asset by a dedicated asset reconstruction company (ARC) including the underlying hypothecated asset, financing of the bad asset conversion into good asset using bonds, debentures, securities and cash, realization of returns from the hypothecated assets etc.

"Asset reconstruction company" means a company registered with Reserve Bank under section 3 for the purposes of carrying on the business of asset reconstruction or securitization, or both;

Asset Reconstruction Companies take over non-performing assets of banks at discounted rate and manage and dispose of such assets, Reconstruction, is to be done with the RBI regulations and the SARFAESI Act gives the following components for reconstruction of assets -

i) taking over or changing the management of the business of the borrower
ii) the sale or lease of a part or whole of the business of the borrower.
iii) rescheduling of payment of debts payable by the borrower
iv) enforcement of security interest in accordance with the provisions of this Act;
v) settlement of dues payable by the borrower
vi) taking possession of secured assets in accordance with the provisions of this Act

It empowers the Reserve Bank of India to regulate asset reconstruction companies in a changing business environment It empowers the RBI to carry out Audit and conduct inspections of an ARC from time to time. The RBI may impose a penalty where an ARC fails to comply with any direction issued by RBI.

b) The Different Types of Risks are-

- **Interest Rate Risk-** Variability in security's return due to changes in interest rates.
- **Market Risk-** variations in return due to fluctuations in the securities market.
- **Inflation Risk-** Risk due to changes in prices of all commodities.

- **Business Risk-** Risk associated with the different activities undertaken by the enterprise.
- **Financial Risk-** Risk resulting from the existence of debt in the capital structure of the company.
- **Liquidity Risk-** Risk associated with the secondary market in which the security is traded.
- **Systematic Risk-** Systematic risk is the risk that affects the entire market and hence, the firm too. It is also called a non-diversifiable risk. It is measured as follows:

$$Systematic\ Risk = \beta_2\ \sigma_2 = \frac{r^2\sigma_s^2 m_m^2}{\sigma_m^2} = r^2\sigma_s^2$$

- **Unsystematic Risk-** Unsystematic Risk is the variability in the security's return on account of the firm specific risk factors. It is also called diversifiable or avoidable risk. It is measured as follows.

$$Unsystematic\ Risk = Total\ Risk - Systematic\ Risk$$

c) Market approach should be applied under following circumstances:

(i) The subject asset has recently been sold in a transaction appropriate for consideration under the basis of value;

(ii) The subject asset or substantially similar assets are actively publicly traded;

(iii) There are frequent and/or recent observable transactions in substantially similar assets;

In some instances, a valuer may consider using other valuation approaches instead of Market approach or in combination with Market approach, such as:

(i) The business to be valued or its market comparable are not traded in the active market;

(ii) Where the business to be valued has fewer identical or comparable assets (market comparable);

(iii) Sufficient information on the comparable transaction is not available;

(iv) There is no recent transaction either in the business or in the market comparable; or

(v) There are material differences between the business to be valued and the market comparable, which require sufficient adjustments.

8. a) Calculation of Discount Rate (Cost of Debenture)

Cost of debenture may be assessed as Government Yield for similar maturity bond + Applicable Credit Spread

Cost of debenture = 7% + 11% = 18%

Annual interest = 100 ×15% = ₹15

Redemption Value = 100 + 100 × 2% = ₹102

Value of the Debenture = 14 × PVIF $_{(18\%,5\text{ years})}$ + 102 DF $_{(18\%,\ 5\text{ years})}$

= 14 × 3.685 + 102 × 0.41

= ₹93.41

b) (i) Market value of companies before merger:

Particulars	Shivani Limited	Agam Limited
EPS (₹)	2	4
P/E Ratio	10	5
Market price per share (₹)	20	20
Number of equity shares	5,00,000	1,25,000
Total market value (₹)	1,00,00,000	25,00,000

(ii) Post merger effect on Shivani Limited:

Particulars	
Post merger earnings (10 lakhs +5 lakhs) (₹)	15,00,000.00
Equity shares (exchange ratio 1:5) (5 lakhs + 1.25 lakhs/5)	5,25,000
EPS (₹)	2.86
P/E ratio	10
Market price per share (₹) (2.86x10)	28.57
Total market value (₹)	1,50,00,000

Gains from merger for Shivani Limited:

Particulars		(₹)
Post merger market value of the firm		1,50,00,000
Less: Pre-merger market value		
Shivani Limited (₹)	1,00,00,000	
Agam Limited (₹)	25,00,000	1,25,00,000
Gains		25,00,000

Apportionment of gains between shareholders:

Particulars	Shivani Limited	Agam Limited
Post merger market value		
5,00,000 x 28.57	1,42,85,714	
25,000 x 28.57		7,14,286

Less: pre merged market value	1,00,00,000	25,00,000
Gains	42,85,714	(17,85,714)

Conclusion: Shareholders of Shivani Limited will be better off than before the merger situation.

(iii) Post merger earnings:

Increase in earnings by 20%

New earnings ₹ 15,00,000 × 120% = ₹ 18,00,000

Number of equity shares = 5,25,000

Earnings Per Share (EPS) = ₹18,00,000/5,25,000 = ₹3.429

P/E ratio = 10

Market price per share = ₹3.429 × 10 = ₹34.29

9. a)

Particulars	X Ltd	Y Ltd	Z Ltd	Average
P/E Ratio (Price per share/EPS)	22.95	8.93	19.64	17.17
P/Book Value Ratio (Price per share/book value per share)	4.39	3.85	4.08	4.10
P/Sales Ratio (Price per share/sales per share)	2.32	2.14	2.32	2.26

Particulars	Megha Ltd (₹)	Average Multiple	Value per share (₹)
P/E Ratio	3.90	17.17	66.96
P/Book Value Ratio	22.20	4.10	91.02
P/Sales Ratio	39.60	2.26	89.50

Here, since we have used actual transaction prices, there may not be any need to adjust the control premium in this case and this may be treated as a fair price for the deal.

b) Calculation of Fair Value of Property, plant and Equipment:

Property, Plant and Equipment	Book Value (₹ in lakhs)	Market Value (₹ in lakhs)
Plant and Machinery	319.97	319.97
Land	220.70	220.71 + 15% = 253.80
Total	540.67	573.77

Calculation of Fair Value of Investments:

Investments	Value per share (₹)	No. of shares (units)	Market value (₹ in lakhs)
Wipro	2,000	35,000	700
TCS	2,700	18,000	486
Total			1,186

Particulars	(₹ in lakhs)	March 31, 2022 (₹ in lakhs)
Book value of assets		2,384.04
Book value of liabilities		1,501.55
Book Value of Equity		882.49
Less: Book value of Investments	1,099.28	
Less: Book value of PPE	540.67	
Add: Fair Value of Investments	1,186	
Add: Fair value of PPE	573.77	
Adjustment for change in fair values		119.82
Net Asset Value (Fair Value basis)		762.67
Number of shares		3.28
Value per share (₹)		232.52

i) Book Value of the Company is ₹882.49 lakhs.
ii) Net Asset Value of the company on fair value basis ₹762.67 lakhs.
iii) Value per share on fair value basis is ₹232.52.

10. Calculation of ROOC:

Particulars (amount in INR Lakhs)	2021	2022
PBT	148	192
Add: Interest expenses	6	10
	154	202
Less: Tax @ 35%	53.9	70.7
NOPAT (A)	100.1	131.3
Operating Capital		
Equity Shareholder's Fund	400	562
Long Term Debt	210	178
Operating Capital (B)	610	740
ROOC = A/B × 100	16.41%	17.74%

Calculation of WACC:

Particulars	**2021**	**2022**
K_d	8% (1-0.35) × 210/610	9% (1-0.35) × 178/740
	1.79%	1.41%
K_e	12% × 400/610	15% × 562/740
	7.87%	11.39%
WACC	9.66%	12.8%
EVA		
ROOC	16.41%	17.74%
Less: WACC	9.66%	12.8%
EVA Spread	6.75%	4.94%
EVA = Spread × Operating Capital	₹ 4,117.5 lakhs	₹ 3,655.6 lakhs

Since, EVA has declined in the Year 2022 by ₹461.9 lakhs, this can be attributed as a reason for non-satisfaction.