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

**The figures in the margin on the right side indicate full marks.**

## SECTION – A (Compulsory)

**1.** **(a)** **Choose the correct option:** [10 x 2 = 20]

**(i)** The following details are given for a company:
Sales - ₹ 1,00,000; Costs - ₹ 75,000; Depreciation - ₹ 20,000; Tax - 35% Change in Net Working Capital - ₹ 1,000; Change in Capital Spending - ₹10,000. Then the Free Cash Flow to Firm (FCFF) will be:
a) ₹3,250
b) ₹6,750
c) ₹10,250
d) ₹12,250

**(ii)** Burnpur Cements Ltd. earned free cash flow to Equity Shareholders during the Financial Year ending 2016 at ₹4.5 lakhs and its cost of equity is 13% with a projected earnings growth rate of 10%. The market value of debt is ₹50 lakhs. The value of firm as per Constant Growth Valuation Model will be:
a) ₹4,50,000
b) ₹1,45,000
c) ₹1,50,000
d) ₹1,65,000

**(iii)** X Ltd. has ₹100 crores worth of common equity on its balance sheet comprising of 50 lakhs shares. The company's Market Value Added (MVA) is ₹24 crores. What is company's stock price?
a) ₹230
b) ₹238
c) ₹248
d) ₹264

**(iv)** P Ltd. intends to acquire R Ltd. (by merger) based on market price of the shares. The following information is available of the two companies.

| | P Ltd. | R Ltd. |
|---|---|---|
| No. of Equity shares | 10,00,000 | 6,00,000 |
| Earning after tax | 50,00,000 | 18,00,000 |
| Market value per share | ₹ 30 | ₹ 25 |

New EPS of R Ltd. after merger will be:
a) ₹4.00
b) ₹4.05
c) ₹4.60
d) ₹4.53
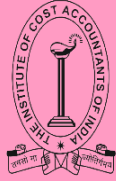
(v)     Duration of a bond will _____ when the yield-to-maturity on the bond increases.
   a)     Decrease
   b)     Increase
   c)     Not Change
   d)     All three above are possible

(vi)    The Average Cost of a firm is given by the function Average Cost = x3 + 12x$^2$ – 11x, its marginal cost will be:
   a)     $4x^3 + 36x^2 - 22x$
   b)     $x^4 + 12x^3 - 11x^2$
   c)     $x^3 + 12x^2 - 11x$
   d)     None of the above

(vii)   _____ give target company bondholders the right to sell their bonds back to the target at a pre-specified redemption price in the event of a takeover.
   a)     Poison pills
   b)     Poison puts
   c)     Share repurchase
   d)     None of these

(viii)  If value of A Ltd. is 50, B Ltd. is 20 and on merger their combined value is 90 and A Ltd. receives premium on merger 12, the synergy for merger is (all amounts are in ₹ Lakhs) —
   a)     ₹8
   b)     ₹20
   c)     ₹32
   d)     ₹38

(ix)    This is the estimated price for the transfer of an asset or liability between identified knowledgeable and willing parties that reflects the respective interests of those parties:
   a)     Market Value
   b)     Liquidation Value
   c)     Equitable Value
   d)     Investment Value

(x)     Six Sigma is a business-driven, multi-dimensional structured approach to:
   a)     Reducing process variability
   b)     Lowering Defects
   c)     Improving Processes
   d)     All of the above

(b)     Read the following scenario and answer the following questions:                    [5 x 2 = 10]

There are four firms (A, B, C and D) which operates under similar conditions and comparable. The top management of Firm B is worried about the profitability of the firm and anticipates that the firm's operational efficiency is relatively poor which is projected in declining market share of the company as well as other operational ratios.

Miss Lizi, the cost accountant of Firm B has been authorised by the top management to look into the matter and report back. Miss Lizi is able to extract the following data of the four firms.

| Firm | Capital Employed (₹ in Millions) | Value added (₹ in Millions) |
|------|----------------------------------|-----------------------------|
| A | 8.6 | 1.8 |
| B | 2.2 | 0.2 |
| C | 15.6 | 2.8 |
| D | 31.6 | 4.1 |

She is of the opinion that the value added is the comparable output and the capital employed is the comparable input. Accordingly, she extracts the data of the two variable across the four firms.

Choose the correct option from the given alternatives based on the above scenario:

(i)   Which firm has the highest efficiency?
   a.   A
   b.   B
   c.   C
   d.   D

(ii)   Relative efficiency of Firm B is
   a.   85.88
   b.   43.40
   c.   62.08
   d.   100

(iii)   For Inefficient firm,
   a.   Input target = Actual Input
   b.   Input target > Actual Input
   c.   Input target < Actual Input
   d.   Input target = Input Slack

(iv)   Input Slack for Firm B is
   a.   2.2
   b.   1.245
   c.   0
   d.   0.955

(v)   Output Target for Firm B is
   a)   ₹0.46 million
   b)   ₹0.26 million
   c)   ₹0.95 million
   d)   ₹0.80 million

**Answer:**

**(a)**

| i | ii | iii | iv | v | vi | vii | viii | ix | x |
|---|----|-----|----|---|----|-----|------|----|---|
| d | d | c | d | a | a | b | b | c | d |

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**(b)**

| i | ii | iii | iv | v |
|---|----|-----|----|----|
| a | b | c | b | a |

## SECTION – B

**(Answer any five questions out of seven questions given. Each question carries 14 Marks.)**     **[5x14=70]**

2.    (a)    **Explain the four intrinsic flows of the supply chain and Components of Supply Chain Management.**    **[7]**

(b)    **Distinguish between Six Sigma and Total Quality Management.**    **[7]**

**Answer:**

**(a)**    Supply chain is also known as 'value chain' when the 'links' are considered as value adding activities. The supply chain is also considered as a 'demand chain' when the chain is considered as a continuous demand originated from the consumers stretched to upstream suppliers. There are four intrinsic flows of the supply chain.

a)    **Material flow**: For all manufacturing entities, materials flow from the beginning of the supply chain and flows to the customers as finished products, who are at the end of the supply chain.

b)    **Information flow:** Unlike material flows, information flows both upstream and downstream. It is important to note that information requirement and flow is specific to a supply chain and differs from requirement in another supply chain.

c)    **Finance flow:** Finance is the lifeblood of business and therefore smooth finance flow is an important aspect of the supply chain. Without smooth finance flow supply chains falters and becomes ineffective. Finance flows downstream and ultimately adds value to the supply chain.

d)    **Commercial flow:** Most supply chains represent a transactional commercial flow. This means that the material flow that runs through the supply chain changes its ownership. This transactional commercial flow will only take place in a supply chain where there are more than one company in the supply chain.

Customer satisfaction in terms of quality products and timely delivery and internal operating efficiencies of the companies in the supply chain are the two aspects of effective supply chain management. Internal operating efficiency is measured in terms of the rate of return on investments in inventory and other assets and lower than average operating expenses. As such, companies in the supply chain -referred as 'links'- have to make effective decisions regarding the five specific areas.

a)    **Production:** Producing as per requirements of the market is the primary requirement of supply chain management. It needs immaculate planning. Master production schedules have to be in place which takes into account plant capacities, workload balancing, quality control and equipment maintenance scheduling.

b)    **Inventory:** In supply chain management, decisions regarding inventory to be held at each

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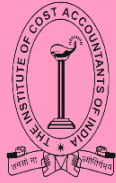
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stage of the supply chain is crucial as a wrong decision has a cascading effect. Inventory often acts as a buffer against uncertainty in the supply chain. However, higher the inventory, higher is the cost of holding. Thus optimal inventory levels need to be fixed which will have a positive impact on all the links of the supply chain.

c) **Location:** The next important decision making issue, in supply chain management, is the selection of location for production and storage of inventory. The underlying issue is cost efficiency. These decisions facilitate products to flow through the supply to the final customer.

d) **Transportation:** Decision regarding inventory, discussed previously, is related to the mode of transportation. Cost effective mode of transportation results in delayed movement of products and uncertainty in transportation. The uncertainty may be countered with higher stock levels which will increase the cost of investment in inventory. Thus deciding upon the mode of transportation is critical to the success of the supply chain.

e) **Information:** Smooth flow of information is the key to successful implementation of supply chain and its management. With good information, people can make effective decisions about what to produce and how much, about where to locate inventory, and how best to transport it.

**(b)** TQM, Six-Sigma, and Toyota production system (or lean production), are three main quality improvement programs initiated by various companies in order to better their production processes to meet ever-growing challenges of the new competitive business environment. All three are quality improvement programs. Of the two, lean production system is taken up for discussion in the next section.

Both Six Sigma and TQM are quality management tools which have been put to effective use by companies. Although the methodologies and procedures used in the two appear quite similar, there are certain differences between the two which are enumerated in the next few lines;

a) **Six-Sigma is a relatively newer concept than TQM** – while TQM refers to continuous effort by employees to ensure high quality products Six Sigma incorporates many small changes in the systems to ensure effective results and better customer satisfaction. As such TQM evolved, through contributions of various quality gurus post 1950, as a philosophy of quality management. Feigenbaum introduced the concept of "Total Quality Control" (TQC) his first book "Quality Control Handbook" in 1951. This is considered as the starting of the philosophy of TQM. Six Sigma, on the other, incepted in 1981 in Motorola.

b) **Focus** - The main focus of TQM is to preserve existing quality standards whereas. Six Sigma focuses on improving quality by minimizing and eventually eliminating defects from the system.

c) **Implementation** – implementation of Six Sigma is much complicated in comparison to implementation of the TQM process. Deployment of Six Sigma is dependent on certified professionals (referred as Master Black Belts). Even the employees are certified as "Green Belts" or "Black Belts" depending on their level of proficiency. TQM, on the other, is a philosophy which can be referred to a part time activity which does not require any special training.

d) **Results** - Six-Sigma is delivers better and effective results than TQM. Customers' feedbacks make Six Sigma more accurate and result oriented. There is a growing consensus24 that six sigma will outperform TQM in future.

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3. (a) A radio manufacturer produces "x" sets per week at total cost of $x^2 + 78x + 2500$. He is a monopolist and the demand function for his product is $x = (600-P)/8$, when the price is "p" per set.

Demonstrate that maximum net revenue is obtained when 29 sets are produced per week and calculate the monopoly price. [7]

(b) Explain the qualitative and quantitative methods of risk analysis. [7]

**Answer:**

(a) Cost (C) = $x^2 + 78x + 2500$

Demand (D) $X = (600 - P) / 8$

$8x = 600 - P$

∴ $P = 600 - 8x$

Total Revenue per "x" sets

Price = $600x - 8x^2$

Maximum revenue is obtains at MC = MR

Marginal Cost = dc/dx = $2x + 78$ ----------- (i)

Marginal Revenue = dr/dx = $600 - 16x$ -------------------- (ii)

Equating (i) & (ii),

$2x + 78 = 600 - 16x$

or, $18x = 522$

∴ $x = 522/18 = 29$

Monopoly price = $600 - 8x$

= $600 - (8 \times 29)$

= $600 - 232 = 368$.

(b) **Qualitative Methods**

This method of risk analysis is most often used for decision making in business projects; entrepreneurs base themselves on their judgment, experience and intuition for decision making. These methods can be used when the level of risk is low and does not warrant the time and resources necessary for making a full analysis. These methods are used when the numerical data available are not adequate for quantitative analysis that would serve as the basis for a subsequent and more detailed analysis of the entrepreneur's global risk. Qualitative risk analysis is referred as the base for quantitative risk analysis, and it's beneficial because not only the uncertainty in the project gets reduced, but also focuses on the high-impact risks. Thus it helps the prioritization of risk.

The qualitative methods include:

- Brainstorming
- Questionnaire and structured interviews
- Evaluation for multidisciplinary groups
- Judgment of specialists and experts (Delphi Technique)

**Quantitative Methods:**

Quantitative risk analysis tallies the possible outcomes for the project and figures out the probability of accomplishing project objectives. This assists decision-making, especially when

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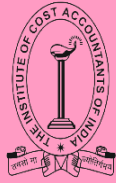
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there is uncertainty in the planning phase. It helps project managers create realistic cost, schedule and targets. These are considered to be those that enable us to assign values of occurrence to the various risks identified, that is, to calculate the level of risk of the project. Quantitative method encompasses.

- Analysis of likelihood
- Analysis of consequences and
- Computer simulation.

4. (a) **Explain the Five Components of DuPont Analysis.** [7]

   (b) **Using Altman's Model (1968) of Corporate Distress Prediction, Calculate the Z score of S & Co. Ltd., whose five accounting ratios are given as below and Interpret, its financial position.**
   **The five variables are:**
   (i) **Working Capital to Total Assets =25%**
   (ii) **Retained Earnings to Total Assets = 30%**
   (iii) **EBIT to Total Assets = 15%**
   (iv) **Market Value of Equity Shares to Book Value of Total Debt =150%**
   (v) **Sales to Total Assets = 2 times.** [7]

**Answer:**

(a) The 5 – component DuPont analysis is an extension of the original model presented in the above section. In this case, the ROE is segregated into five components which provide information on five aspects of profitability.

The identity 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:
ROE = (EBIT/ Sales) × (EBT/EBIT) × (EAT/ EBT) × (Sales/Total Assets) × (Total Assets/ 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) are 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 burdens which further imply that there is no debt in the capital structure (all equity firms).

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- **(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.

**(b)** As per Altman 's Model (1968) of Corporate Distress Prediction:

$Z = 1.2x_1 + 1.4x_2 + 3.3x_3 + 0.6x_4 + 1.0x_5$

Given 5 variables are:

$x_1$ = Working Capital to Total Assets = 25%

$x_2$ = Retained earnings to total Assets = 30%

$x_3$ = EBIT to Total Assets = 15%

$x_4$ = Market Value of Equity Shares to Book Value of Total Debts = 150%

$x_5$ = Sales to Total Assets = 2 times

Hence, Z -score = $(1.2 \times 25\%) + (1.4 \times 30\%) + (3.3 \times 15\%) + (0.6 \times 150\%) + (1 \times 2)$

= 0.30 + 0.42 + 0.495 + 0.90 + 2.00 = 4.115.

Interpretation on the financial position: As the calculated value of Z-score is much higher than 2.99, it can be strongly predicted that the company is a non-bankrupt company.

**5. (a)** **ABC Ltd has FCFF of ₹170 Crores and FCFE of ₹130 Crores. ABC Ltd's WACC is 13% and its cost of equity is 15%. FCFF is expected to grow forever at 7% and FCFE is expected to grow forever at 7.5%. ABC Ltd has debt outstanding at ₹1500 Crores. Calculate the value of ABC Ltd using FCFF approach and FCFE approach.**
**[7]**

**(b)** **Quinton Johnston is evaluating TMI Manufacturing Company, Ltd., which is headquartered in Taiwan. In 2019, when Johnston is performing his analysis, the company is unprofitable. Furthermore, TMI pays no dividends on its common shares. Johnston decides to value TMI Manufacturing by using his forecasts of FCFE. Johnston gathers the following facts and assumptions.**

**(i)** **The company has 17 billion shares outstanding.**

**(ii)** **Sales will be 5.5 billion in 2020, increasing at 28% annually for the next four years (through 2024).**

**(iii)** **Net income will be 32% of sales.**

**(iv)** **Investment in fixed assets will be 35% of sales; investment in working capital will be 6% of sales;**

**(v)** **Depreciation will be 9% of sales.**

**(vi)** **20% of the investment in assets will be financed with debt.**
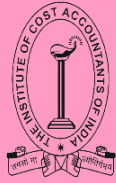
(vii)    **Interest expenses will be only 2% of sales.**

(viii)    **The tax rate will be 10%. TMI Manufacturing's beta is 2.1; the risk-free government bond rate is 6.4%;**

(ix)    **The equity risk premium is 5%.**

(x)    **At the end of 2024, Johnston projects TMI will sell for 18 times earnings.**

**Calculate the value of one ordinary share of TMI Manufacturing Company.**     [7]

**Answer:**

(a)    **FCFF Approach: (discount rate = WACC)**

The firm value is the present value of FCFF discounted at the weighted-average cost of capital (WACC):

=   $FCFF_t /(k-g)$

=   $170 \times 1.07 / (0.13 - 0.07)$

=   ₹ 3031.67 Crores

The market value of equity is the value of the firm minus the value of debt:

Equity = 3031.67 - 1500

       = ₹ 1531.67 Crores

**FCFE Approach: (Discount Rate = Cost of Equity)**

Using the FCFE valuation approach, the present value of FCFE, discounted at Cost of equity

= $FCFE_t/(k-g)$

= $130 \times 1.075/(0.15 - 0.075)$

= ₹ 1863.33 Crores

(b)    The required rate of return found with the CAPM is

$k_e = R_f + (R_m - R_f) \times \beta$

$k_e = 6.4\% + 5\% \times 2$

$k_e = 16.4\%$

The following table shows the values of sales, net income, capital expenditures less depreciation, and investments in working capital. FCFE equals net income less the investments financed with equity:

FCFF = Net income – (1 – DR) (Capital Expenditure – Depreciation) – (1 – DR) (Investment in Working Capital)

Where DR is the Debt Ratio (debt financing as a percentage of debt and equity). Because 20 percent of new investments are financed with debt, 80 percent of the investments are financed with equity, which reduces FCFE by 80 percent of (Capital expenditures – Depreciation) and 80 percent of the investment in working capital.

| Particulars (in billions) | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Sales (growing at 28%) | 5.5 | 7.04 | 9.01 | 11.53 | 14.76 |
| Net income = 32% of sales | 1.760 | 2.253 | 2.884 | 3.691 | 4.724 |
| Investment in Fixed asset - Dep = (35% - 9%) × sales | 1.43 | 1.830 | 2.343 | 2.999 | 3.839 |

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| | | | | | |
|---|---|---|---|---|---|
| Working capital investment = 6% of sales | 0.33 | 0.422 | 0.541 | 0.692 | 0.886 |
| .80 × (Investment in Fixed asset - Dep + Working capital investment) | 1.408 | 1.802 | 2.307 | 2.953 | 3.780 |
| FCFE = Net income - .80 × (Investment in Fixed asset - Dep + Working capital investment) | 0.352 | 0.451 | 0.577 | 0.738 | 0.945 |
| PV of FCFE discounted at 16.4% | 0.302 | 0.333 | 0.366 | 0.402 | 0.442 |
| Terminal Value (4.724 × 18) | | | | | 85.04 |
| PV of Terminal Value discounted at 16.4% | | | | | 39.7979 |
| **Total PV of FCFE** | | | | | **1.845** |
| **Total value of firm** | | | | | **41.643** |

The present value of the terminal value plus PV of first five year's FCFE is 41.643 billion. Because TMI Manufacturing has 17 billion outstanding shares, the value per ordinary share is ₹ 2.45.

6. (a) From the following details, Evaluate, the total value of human resources for employee groups - skilled and un-skilled as per Lev and Schwartz (1971) model.

| Particulars | Skilled | Un-Skilled |
|---|---|---|
| (i) Annual average earning of an employee till age of retirement | ₹ 1,00,000 | ₹ 60,000 |
| (ii) Age of retirement | 65 years | 62 years |
| (iii) Discount rate | 20% | 20% |
| (iv) No. of employees in the group | 25 | 20 |
| (v) Average age | 62 years | 60 years |

It is assumed that employees will leave the organization only on retirement. [7]

(b) You are given following information about Sandeep Ltd.:
(i) Beta for the year 2023-24: 1.05
(ii) Risk free rate 12%
(iii) Long Range Market Rate (based on BSE Sensex): 15.14%
(iv) Extracts from the liabilities side of balance sheet as at 31st March, 2024:

| Particulars | ₹ |
|---|---|
| Equity | 29,160 |
| Reserve & Surplus | 43,740 |
| Shareholder's Fund | 72,900 |
| Loan Funds | 8,100 |
| Total Funds (Long term) | 81,000 |

(v) Profit after tax ₹20,394.16 lakhs
(vi) Interest deducted from profit ₹487.00 lakhs
(vii) Effective tax rate (i.e. Provision for Tax/PBT × 100) 24.45%.
Calculate Economic Value Added of Sandeep Ltd. as on 31st March 2024 [7]

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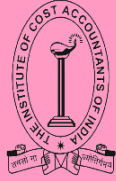
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**Answer:**

(a) (i) Value of skilled employees:

$100{,}000 / (1+ (0.20))^{(65-62)} + 100{,}000 / (1+ (0.20))^{(65-63)} + 100{,}000 / (1+ (0.20))^{(65-64)}$

= 57870.37 + 69444.44 + 83333.33

Total value of this group = 57870.37 + 69444.44 + 83333.33

= 210648.14 × 25 = ₹ 52,66,203.50

(ii) Value of unskilled employees: $60{,}000 / (1+ (0.20))^{(62-60)} + 60{,}000 / (1+ (0.20))^{(62-61)}$

= $60{,}000 / (1.20)^2 + 60{,}000 / (1.20)^1$

= 41666.67 + 50000

Total of this group = 91666.67 × 20 = ₹ 18,33,333

Total value of human resources of both the groups = ₹ 70,99,536.50

(b) We know that EVA = NOPAT -Cost of Capital Employed,

Where, EVA = Economic Value Added

NOPAT = Net Operating Profit after tax

Required Calculations are as under:

(i) **NOPAT**

| PARTICULARS | ₹ |
|---|---|
| Profit after tax | 20,394.16 lakhs |
| Add: Interest Net of tax [ 487 lakh (1 - 0.2445)] = 487 lakh x 0.7555 | 367.93 lakhs |
| NOPAT | 20,762.09 lakhs |

(ii) Cost of Equity: Risk free rate + β [Market rate - Risk free return]

= 12% + 1.05 (15.14% - 12%)

= 12% + 1.05 x 3.14

= 12% + 3.30%

= 15.30%

(iii) Cost of Debt = [Interest on Loan Funds (1 - tax rate) / Loan Funds] x 100

Cost of Debt = [487 x (1-0.2445) /8100] x 100

= [487 x 0.7555/ 8100] x 100

= [367.93/8100] x 100

= 4.54

Weighted Average Cost of Capital:

| | Amount in Lakhs (₹) | Weight | Cost | WACC% |
|---|---|---|---|---|
| Equity | 72,900 | 0.90 | 15.30 | 13.77 |
| Debt | 8,100 | 0.10 | 4.54 | 0.45 |
| | 81,000 | 1.00 | | 14.22 |

Cost of capital employed

= ₹ 81,000 x 14.22%

= ₹ 11,518.20 lakhs

EVA = NOPAT – Cost of Capital Employed

= ₹ 20,726.09 lakhs - ₹ 11,518.20 lakhs

= ₹ 9,207.89 lakhs

**7.**    **(a)**    **Q Ltd. wants to acquire R Ltd. and has offered a swap ratio of 1: 2 (0.5 shares for every one share of R Ltd.). Following information is provided:**

| Particulars | Q Ltd. | R Ltd. |
|---|---|---|
| Profit after tax (₹) | 18,00,000 | 3,60,000 |
| Equity shares outstanding (Nos.) | 6,00,000 | 1,80,000 |
| EPS (₹) | 3 | 2 |
| P/E Ratio | 10 times | 7 times |
| Market price per share (₹) | 30 | 14 |

     **(i)**    **Calculate, the number of equity shares to be issued by Q Ltd., for acquisition of R Ltd.**

     **(ii)**    **Calculate the EPS of Q Ltd., after the acquisition.**

     **(iii)**    **Evaluate the equivalent earnings per share of R Ltd.**

     **(iv)**    **Calculate the expected market price per share of Q Ltd., after the acquisition, assuming its P/E multiple remains unchanged.**

     **(v)**    **Evaluate the market value of the merged firm.**      **[7]**

   **(b)**    **R Ltd. is intending to acquire S Ltd. (by merger) and the following information is available in respect of both the companies—**

| Particulars | R ltd | S ltd |
|---|---|---|
| Total current earnings | ₹ 2,50,000 | ₹ 90,000 |
| Number of outstanding shares | 50,000 | 30,000 |
| Market price per share | ₹ 21 | ₹ 14 |

**You are required to—**

     **(i)**    **Calculate Present EPS of both the companies.**

     **(ii)**    **If the proposed merger takes place. Evaluate, what would be the new EPS for R Ltd. (assuming that merger takes place by exchange of equity shares and the exchange ratio is based on the current market price)**

     **(iii)**    **Calculate the exchange ratio if S Ltd., wants to ensure the same earnings to members as before the merger took place.**      **[7]**

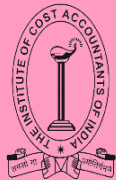   **Answer:**

   **(a)**    (i)    The number of shares to be issued by Q Ltd.:

         The Exchange ratio is 0.5

         So, the new shares = 1,80,000 × 0.5 = 90,000 shares

     (ii)    EPS of Q Ltd., after acquisition:

| Total Earnings = ₹ (18,00,000 + 3,60,000) | ₹ 21,60,000 |
|---|---|
| No. of Shares (6,00,000 + 90,000) | ₹ 6,90,000 |
| EPS (₹ 21,60,000) / 6,90,000 | ₹ 3.13 |

     (iii)    Equivalent EPS of R Ltd.,

| No. of new shares | 0.5 |
| --- | --- |
| EPS (₹) | 3.13 |
| Equivalent (3.13 ×0.5) (₹) | 1.57 |

(iv) New Market price of Q Ltd., (P/E remaining unchanged):

| Present P/E Ratio of Q Ltd., | 10 times |
| --- | --- |
| Expected EPS after merger (₹) | 3.13 |
| Expected Market Price (3.13 × 10) (₹) | 31.30 |

(v) Market Value of merged firm:

| Total number of Shares | 6,90,000 |
| --- | --- |
| Expected Market Price (₹) | 31.30 |
| Total Value (6,90,000 x 31.30) (₹) | 2,15,97,000 |

**(b)** (i) EPS = Total Earnings/No. of Equity shares

EPS $_{R\ ltd}$ = 2,50,000 /50,000= ₹ 5

EPS $_{S\ ltd}$ = 90,000/30,000= ₹ 3

(ii) No. of shares S Ltd shareholders will get in R Ltd based on market prices of shares is as follows:

Exchange Ratio = 14/21 =2/3 i.e. for every 3 shares of S Ltd 2 shares of R Ltd

Total No. of shares of R Ltd issued = 14/21×30,000= 20,000 shares

Total number of shares of R Ltd after merger = 50,000+20,000=70,000

Total Earnings of R Ltd after merger =  2,50,000+90,000=3,40,000

[Remember no synergy given]

The new EPS of R Ltd after merger = ₹ 3,40,000/70,000= ₹ 4.86.

(iii) Calculation of Exchange Ratio to ensure S Ltd to earn the same before the merger took place: Both acquiring and acquired firm can maintain their EPS only if the merger takes place based on respective EPS.

Exchange Ratio based on EPS=3/5=0.6

Total Shares of R Ltd receivable by S Ltd. Shareholders = 0.6×30,000=18,000

Total number of shares of R Ltd after merger = 50,000+18,000=68,000

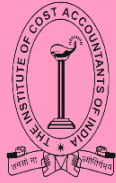EPS after merger = Total Earnings/Total number of shares = [₹ 2,50,000+₹ 90,000] /68,000 = ₹ 5.

Total Earnings after merger of S Ltd = ₹ 5×18,000= ₹ 90,000

**8.** **(a)** **From the following income statement, illustrate a common size statement and also interpret the result.**

**Income Statement for the year ended 31st March**

| | 2023 (₹) | 2024 (₹) |
| --- | --- | --- |
| **Net Sales** | 10,50,000 | 13,50,000 |
| **Less : - Cost of goods sold** | 5,70,000 | 6,45,000 |
| **Gross Profit** | 4,80,000 | 7,05,000 |
| **Less :- Other operating expenses** | 1,50,000 | 2,16,000 |
| **Operating profit** | 3,30,000 | 4,89,000 |
| **Less :- Interest on long term debt** | 60,000 | 51,000 |

| | | |
|---|---|---|
| Profit before tax | 2,70,000 | 4,38,000 |

[7]

(b) **Highland Company is considering the acquisition of Lowland Company in a stock- for-stock transaction in which Lowland Company would receive ₹90 for each share of its common stock. Highland company does not expect any change in its price/earnings ratio multiple after the merger and chooses to value Lowland company conservatively by assuming no earnings growth due to synergy.**

**Calculate:**

(i) **The purchase price premium**

(ii) **The exchange ratio**

(iii) **The number of new shares issued by Highland company.**

(iv) **Post-merger EPS of the combined firms**

(v) **Pre-merger EPS of the Highland company**

(vi) **Pre-merger P/E ratio**

(vii) **Post-merger share price**

(viii) **Post-merger equity ownership distribution.**

**The following additional information is available.**

| Particulars | Highland | Lowland |
|---|---|---|
| Earnings | ₹ 2,50,000 | ₹ 72,500 |
| Number of Shares | 1,10,000 | 20,000 |
| Market Price per share | ₹ 50 | ₹ 60 |

[7]

**Answer:**

**(a)**

| Particulars | 2023 (₹) | % | 2024 (₹) | % |
|---|---|---|---|---|
| Net Sales | 10,50,000 | 100 | 13,50,000 | 100 |
| Less : - Cost of goods sold | 5,70,000 | 54.29% | 6,45,000 | 47.78% |
| Gross Profit | 4,80,000 | 45.71% | 7,05,000 | 52.22% |
| Less :- Other operating expenses | 1,50,000 | 14.29% | 2,16,000 | 16.00% |
| Operating profit | 3,30,000 | 31.43% | 4,89,000 | 36.22% |
| Less :- Interest on long term debt | 60,000 | 5.71% | 51,000 | 3.78% |
| Profit before tax | 2,70,000 | 25.71% | 4,38,000 | 32.44% |

**Comment:**

(i) The PBT to net sales has increased from 25.7% in the year 2022-23 to 32.4% in the year 2023-24. It indicates that the profit earning capacity of the company has improved during the study period. This improvement in the profitability of the company has been mainly due to significant reduction in the cost of goods sold of the company. It may occur due to fall down of input market or may occur due to improvement in the efficiency of the company. As other operating expenses has higher in 2023-24 so, it is clear that company has been operated with tight supervision, tight inventory control for reduction of COGS (Cost of Goods Sold).

(ii) The interest on long term debt to net sales has declined from 5.7% in the 2022-23 to 3.8% in 2023-24.It implies that the financial burden of the company has reduced significantly during the study period. Higher operating profit or fund from operation has been utilised

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for repayment of long term debt, so that the financial risk associated with the company has declined significantly during the study period.

**(b)  (i)    Purchase price premium**

= Offer price for Lowland company stock / Lowland company Market price per share

= 90 / 60

= 1.5

**(ii)   Exchange ratio**

= Price per share offered for Lowland Company/Market Price per share for Highland company

= 90 / 50

= 1.8

Highland company issues 1.8 shares of stock for each of Lowland Company's stock.

**(iii)  New shares issued by Highland company**

= shares of Lowland Company × Exchange ratio

= 20,000 × 1.8 = 36,000.

**(iv)  Post-merger EPS of the combined companies**

= Combined earning / Total number of shares.

Combined earnings = (2,50,000 + 72,500) = ₹ 3,22,500

Total shares outstanding of the new entity = 1,10,000 + 36,000 = 1,46,000

Post-merger EPS of the combined companies = ₹ 3,22,500 ÷ 1,46,000 = ₹ 2.21

**(v)   Pre-merger EPS of the Highland company**

= earnings / Number of shares = 2,50,000 / 1,10,000 = ₹ 2.27

**(vi)  Pre-merger P/E**

= Pre-merger market price per share / Pre-merger earnings per share

= 50 / 2.27 = 22.00

**(vii)  Post-merger share price**

= Post-merger EPS × Pre-merger P/E

= 2.21 × 22.00 = ₹ 48.60 (as compared to ₹ 50 Pre-merger)

**(viii)  Post-merger Equity Ownership Distribution**

Lowland Company = Number of new shares / Total number of shares

= 36,000/ 1,46,000 = 0.2466 or 24.66%

Highland company = 100 – 24.66 = 75.34%

**Comment** – The acquisition results in a ₹1.40 reduction in the market price of Highland company due to a 0.064 decline in the EPS of the combined companies. Whether the acquisition is a poor decision depends upon what happens to the earnings would have in the absence of the acquisition, the acquisition may contribute to the market value of Highland company.