



INDIAN SCHOOL AL WADI AL KABIR

DEPARTMENT OF COMMERCE

Chapter 5 Business Arithmetic

1. Define: Unit of sale, Unit Price, Unit Cost.

Ans: **Unit of sale:** It is the measure of products that are sold, it refers to the quantity sold by a business.

Unit Price: It is the price at which one unit of sale (quantity) is sold.

Unit cost: Cost of unit can be defined as the cost incurred by a business to produce, store and sell one unit of sale (quantity) of a particular product or service.

2. At BEP, which of the condition is to be fulfilled: (Choose the correct option)

A. Total Revenue = Total Profit

B. Total Profit = Total Cost

C. Total revenue = Total cost

D. Total Revenue = fixed cost.

3. Fill in the blanks:

(a) The _____ is the Unit of Sale for multi-product business.

Customer.

(b) The average billing per customer is considered as _____ for multi-product business.

Unit Price.

(c) If 70 customers bought goods worth Rs,21,000, then the unit price is _____

Rs.300.

4. If the purchase price is 80% of selling price, and the selling Price is Rs,2,000. Then the gross profit per unit earned by the business is: (Choose the correct answer)

A. Rs.1,000

B. Rs.500

C.Rs.1,600

D.Rs.400

5. The formula for Break even point for a single product business is: (Choose the correct option)

- A. Fixed cost/Selling price
- B.Fixed cost/ (unit price – unit cost)
- C. Fixed cost/ Gross margin per unit.

D. Both B and C

6.Mani Co. ltd manufacturers has three products: Pen, Pencil and Sharpener.

	PEN	PENCIL	SHARPENER
Total weighted average contribution per unit	₹ 10	₹ 12	₹ 8

Total fixed cost is ₹ 90,000.

From the above given information Overall break even points in units will be:

- A. 4,000
- B . 2,000
- C. 3,000**
- D. 5,000

7.Harshit is the stock keeper of Sita Textiles Ltd. The company is into converting cotton yarn into fabric and then further printing on the same to add value to the fabric. He wants to know the ideal quantity of yarn to be ordered so that the production process does not stop.

How can he know the ideal quantity to place an order?

- A. By calculating Break-even point
- B. By calculating Re-order point
- C. By calculating Economic order quantity**
- D. By calculating lead time

8.The total bill in a restaurant during a week was ₹ 18,000. Though the food bill for individual customer was different but the average bill amount was ₹ 150. Based on this information, the number of customer who ate in that restaurant during the week is

- A.90
- B.100
- C.120**
- D.140

9. Farhan sold a mobile hand set for ₹ 2,100. If the purchase price of the product is 80% of its selling price, the profit earned by Farhan is :

- A. ₹ 1,700
- B. ₹ 1,680
- C. ₹ 420**
- D. ₹ 400

10.A business having Cash in hand Rs.2,000; Short term Investment Rs.5,000, Debtors Rs.10,000; Creditors Rs.4,000 and bank overdraft Rs.1,000.

The amount of Gross Working capital is: (Choose the correct answer)

- A. **Rs.17,000**
- B. Rs.12,000
- C. Rs.6,000
- D. Rs.15,000

11. If procurement or manufacturing lead time is 2 months, and demand during this period is expected to be 300 units per month, then the re order level is: (Choose the correct option)

A.150 units

B.600 units

C.100 units

D.500 units

9. What is EBITDA?

The acronym EBITDA stands for earnings before interest, taxes, depreciation and amortization.

12. A grocery store owner has an equity stake of Rs. 40,000 in the business. He has borrowed Rs.60,000. This will attract an interest of @ of 10% per annum. The net profit after tax is Rs. 14,000. Calculate the ROE. (Choose the correct option)

A.25%

B.30%

C.35%

D.40%

13.State True or False: Economic order quantity (EOQ) is the order quantity of inventory that maximizes the total cost of inventory management.

FALSE

14..Number of people who took their meals and the total billing for each of the 5 weeks is in the following table. What are the (a)Unit of sale , (b)Unit Price in this case? If the variable cost is 50% of the sale price, calculate the (c)Unit Cost and the (d) Gross Margin per Unit of Sale.

Weeks	No. of people taking meals	Total amount billed (₹)	Average amount billed (₹)
Week 1	120	18,000	150
Week 2	60	12,300	205
Week 3	70	10,220	146
Week 4	80	17,680	221
Week 5	90	21,600	240
Total	420	79,800	

Ans:

- (a) Unit of sale = 420. (No. of customers)
 (b) Unit Price = $79,800/420 = \text{Rs.}190$ per unit
 (c) Unit cost = $190 \times 50/100 = \text{Rs.}85$.
 (d) Gross margin per unit = Unit price – Unit cost
 $= 190 - 85 = \text{Rs.}85$.

15. . A hotel had varying number of guests during five weeks. The information regarding the number of guests and the average weekly billing is presented in the following table :

Week	No. of Guests	Average Billed Amount ₹
1	240	300
2	120	410
3	140	292
4	160	442
5	180	480

What is the 'Unit of Sale' and 'Unit Price' in this case ? (b) If the cost of goods sold or variable cost is 60% of the sales price, calculate the 'unit cost' and the 'gross profit'.

Ans: Unit of sale = 840.

Unit price = $3,19,000/840 = \text{Rs.}380$

Unit Cost = $380 \times 60/100 = \text{Rs.}228$.

Gross profit = $380 - 228 = \text{Rs.}152$.

16. The product mix of a business consists of 3 products A, B and C. The selling price per unit is Rs.15, Rs.21 and Rs.36 respectively. The Variable cost per unit A – Rs.9; B- Rs.14 and C- Rs19. The Sales mix percentage A- 20%, B- 20%, C- 60%. Total fixed cost Rs.40,000.

Calculate the break-even point in units and in rupees.

Particulars	Product A	Product B	Product C
Selling price/ unit	15	21	36
-Variable cost/unit	(9)	(14)	(19)

Contribution/unit	6	7	17
Weighted average contribution/unit	$6 \times 20/100 = \text{Rs.}1.2$	$7 \times 20/100 = \text{Rs.}1.4$	$17 \times 60/100 = \text{Rs.}10.2$

Sum of Weighted average contribution/unit = $1.2 + 1.4 + 10.2 = \text{Rs.}12.8$.

Total BEP in units = $40,000/12.8 = 3125$ units.

BEP for product A = $3125 \times 20/100 = 625$ units

BEP for product B = $3125 \times 20/100 = 625$ units

BEP for product C = $3125 \times 60/100 = 1,875$ units

BEP in rupees.

Product A = $625 \times 15 = \text{Rs.}9375$

Product B = $625 \times 21 = \text{Rs.}13,125$

Product C = $625 \times 36 = \text{Rs.}22,500$

17.A business deals in the following products: A, B, C and D. The Selling Price: Rs.100,000; Rs.50,000; Rs.70,000 and Rs.2,00,000 respectively Variable Cost: Rs.30,000; Rs.25,000; Rs.30,000 and Rs.100,000 respectively.

Allocated Fixed Expenses per month: Rs.350,000; Rs.2,50,000; rs.10,00,000 and Rs.15,00,000 respectively Compute Break Even Level , show the working.

Ans:

Particulars	Product A	Product B	Product C	Product D
Selling price/ unit	1,00,000	50,000	70,000	2,00,000
-Variable cost/unit	(30,000)	(25,000)	(30,000)	(1,00,000)
Contribution/unit	70,000	25,000	40,000	1,00,000
Allocated Fixed expense	Rs.3,50,000	Rs.2,50,000	Rs.10,00,000	Rs.15,00,000
BEP (units)= Fixed cost/contribut. Per unit	5 units	10 units	25 units	15 units
BEP in Rs= BEP units x SP Total BEP in Rs..57,50,000	Rs.5,00,000	Rs.5,00,000	Rs.17,50,000	Rs.30,00,000

18. 'Flavouright Foods Ltd.' started a business of making nachos (corn chips) in three variants, Classic Cheese, Toasted Corn and Tangy Tomato. To start with, all the three variants will be sold in a standard packing of 100 gm each, the selling price would differ due to the ingredients used. Fixed costs are Rs.38,000.

Sales price and variable costs per unit are as follows :

Particulars	Classic Cheese	Toasted Corn	Tangy Tomato
Sales Price ₹	80	45	60
Variable Cost ₹	40	15	20
Packets sold	100	40	60

From the above information calculate :

- (a) Weighted contribution margin per unit.
 (b) Breakeven point – total and per product.

Ans:

Particulars	Classic Cheese	Toasted Corn	Tangy Tomato
Selling price/ unit	80	45	60
-Variable cost/unit	(40)	(15)	(20)
Contribution/unit	40	30	40
Weighted average contribution/unit	$40 \times 100/200 = \text{Rs.}20$	$30 \times 40/200 = \text{Rs.}6$	$40 \times 60/200 = \text{Rs.}12.$

Sum of Weighted average contribution/unit = $20 + 6 + 12 = \text{Rs.}38$ per unit.

Total BEP in units = $38,000/38 = 1,000$ units

BEP for Classic Cheese = $1000 \times 100/200 = 500$ units

BEP for Toasted Corn = $1000 \times 40/200 = 200$ units

BEP for Tangy Tomato = $1000 \times 60/200 = 300$ units

BEP in Rs.

Classic Cheese = $500 \times 80 = \text{Rs.}40,000$. Toasted Corn = $200 \times 45 = \text{Rs.}9,000$.

Tangy Tomato = $300 \times 60 = \text{Rs.}18,000$.

Total BEP in Rs.67,000

19. Breezolit Pvt. Ltd.' started a business of making three varieties of designer fans – Vitara, Grand, Quadraflow. From the following information, calculate Breakeven point in units for the company and state which variety is most revenue generating. Fixed costs are Rs.15,20,000.

Details	Vitara	Grand	Quadraflow
Sale Price (₹)	800	450	600
Variable Cost (₹)	400	150	200
Sales Mix	50%	20%	30%

Ans:

Particulars	Vitara	Grand	Quadraflow
Selling price/ unit	800	450	600
-Variable cost/unit	(400)	(150)	(200)
Contribution/unit	400	300	400
Weighted average contribution/unit	$400 \times 50/100 =$ Rs.200	$300 \times 20/100 =$ Rs.60	$400 \times 30/100 =$ Rs.120

Sum of Weighted average contribution/unit = $200 + 60 + 120 =$ Rs.380 per unit.

Total BEP in units = $15,20,000/380 =$ 4,000 units

BEP for Vitara = $4000 \times 50/100 =$ 2,000 units

BEP for Grand = $4000 \times 20/100 =$ 800 units

BEP for Quadraflow = $4000 \times 30/100 =$ 1,200 units

BEP in Rs.

Vitara = $2,000 \times 800 =$ 16,00,000. Grand = $800 \times 450 =$ Rs.3,60,000

Quadraflow = $1,200 \times 600 =$ Rs.7,20,000

Total BEP in Rs.26,80,000.

20. The Fancy Store' a readymade garments retail shop sold 8,000 shirts at Rs 400/- per shirt during the year ended 31st March, 2014. Cost of placing an order and receiving goods is Rs 200 per order. Inventory holding cost is Rs 500/- per year. Calculate the 'Economic Order Quantity' for 'the Fancy Store.

Ans:

$$\begin{aligned} \text{EOQ} &= \sqrt{2PD/C} \\ &= \sqrt{2 \times 200 \times 8000/500} \\ &= \sqrt{6400} = 80 \text{ units.} \end{aligned}$$

21. Jalalji an entrepreneur started a new website 'Fashionate Shirts' to sell readymade shirts. In the first year he sold 1200 shirts at the rate of Rs 500 each. His cost of placing an order and receiving the shirts is Rs1000 per order. If the Economic Order Quantity is 200 shirts, find out the inventory holding cost per year.

Ans:

$$\begin{aligned} \text{EOQ} &= \sqrt{2PD/C} \\ 200 &= \sqrt{2 \times 1000 \times 1,200/C} \\ 200 &= \sqrt{24,00,000/C} \end{aligned}$$

$$200^2 = 24,00,000/C$$

$$40,000 = 24,00,000/C$$

$$C = 24,00,000/40,000$$

$$= \text{Rs.60.}$$

22. A book shop sells pens – 30,000 qty per year. Demand is uniform. Purchase cost is Rs.6/- per pen. Holding cost per annum is 20% of purchase cost. Ordering cost is Rs.500/- per order. What should be the EOQ for the shop keeper?

Ans:

Here, D = 30,000; P = 500 and C = 1.2 (20% of 6)

$$\text{So, } Q = \sqrt{2 \times P \times D/C}$$

$$= \sqrt{2 \times 500 \times 30,000 / 1.2}$$

$$= \sqrt{2,50,00,000}$$

$$= 5,000 \text{ units.}$$

23. Harsha started her herbal beauty products shop in Chandigarh with a capital of Rs.9,00,000. She took a loan of Rs.5,00,000 from the State Bank of India at 9% p.a. interest. During the year ended 31st March, 2016 her sales were Rs.20,90,000 and the cost of goods sold was Rs.15,30,000. She paid monthly rent of the shop Rs.11,000 and a monthly salary of Rs.25,000 to the employees. The tax rate is 30%. Calculate the Return on Investment and Return on Equity.

Ans:

$$\text{CE/Investment} = \text{Rs.9,00,000}$$

$$\text{Loan/Debt} = \text{Rs.5,00,000}$$

$$\text{Equity} = \text{Investment} - \text{Loan} = \text{Rs.4,00,000}$$

Income or profit/loss statement for the year ended 31.2.2016

Particulars	Rs.	Rs.
Sales		20,90,000
-Cost of goods sold		(15,30,000)
Gross profit/margin		5,60,000
Less. Expenses:		
Rent (11,000 x 12)	1,32,000	
Salary (25,000 x 12)	3,00,000	
Interest on loan (5,00,000 x 9/100)	45,000	
Total fixed expenses		(4,77,000)
Net profit before tax (GP – Fixed exp)		83,000
- Tax (83,000 x 30/100)		(24,900)
Net profit after tax		58,100

$$\text{ROI} = \frac{\text{net profit}}{\text{Investment}} \times 100$$

Investment

$$= \frac{58,100}{9,00,000} \times 100$$

9,00,000

$$= 6.45\%$$

$$\text{ROE} = \frac{\text{NP}}{\text{Equity}} \times 100$$

Equity

$$= \frac{58,100}{4,00,000} \times 100$$

4,00,000

$$= 14.525\%$$

24. Raj started a restaurant on a National Highway in the name of 'Desi Dhaba' by spending Rs.25,00,000. He invested Rs.10,00,000 of his own and took a loan of Rs.15,00,000 from Dena Bank, @ 6% per annum. His monthly sales revenue is Rs.17,00,000 and cost of goods sold is Rs.9,00,000. He pays monthly salary of Rs.3,00,000 to his employees. The tax rate is 25%.

You are required to calculate : (a) Return on Investment and (b) Return on Equity for Raj.

Ans:

Investment = Rs.25,00,000

Equity = Rs.10,00,000

Loan = Rs.15,00,000

Profit loss statement for the year ended.....

Particulars	Rs.	Rs.
Sales (17,00,000 x 12)		2,04,00,000
-COGS (9,00,000 x 12)		(1,08,00,000)
Gross profit		96,00,000
Less. Expenses		
Salary (3,00,000 x 12)	36,00,000	
Interest (15,00,000 x 6/100)	90,000	
Total fixed expenses		(36,90,000)
Net profit before tax (GP – Fixed exp)		59,10,000
- Tax (59,10,000 x 25/100)		(14,77,500)
Net profit after tax		44,32,500

$$\text{ROI} = \frac{\text{net profit}}{\text{Investment}} \times 100$$

Investment

$$= \frac{44,32,500}{25,00,000} \times 100$$

$$= 177.3\%$$

$$\text{ROE} = \frac{\text{NP}}{\text{Equity}} \times 100$$

$$= \frac{44,32,500}{10,00,000} \times 100$$

$$= 443.25\%$$

25. Aditi started a beauty parlor business. She spends Rs.30,00,000/- to open the parlour of which she invested Rs.14,00,000/- of her own money and borrowed a loan for Rs.16,00,000. Interest rate per annum is 14%. Sales revenue per month is Rs. 1,60,000. Cost of goods sold is Rs. 60,000/- per month. Fixed expenses for that month is Rs. 60,000 (salary Rs.40,000, rent and utility Rs. 20,000), depreciation Rs.30,000 and tax @ 15%.

Calculate ROI and ROE

Ans:

Investment = Rs.30,00,000
 Equity = Rs.14,00,000
 Loan = Rs.16,00,000

Profit loss statement for the year ended.....

Particulars	Rs.	Rs.
Sales (1,60,000 x 12)		19,20,000
-COGS (60,000 x 12)		(7,20,000)
Gross profit		12,00,000
Less. Expenses		
Salary (40,000 x 12)	4,80,000	
Rent/Utility(20,000 x 12)	2,40,000	
Interest (16,00,000 x 14/100)	2,24,000	
Depreciation	30,000	
Total fixed expenses		(9,74,000)
Net profit before tax (GP – Fixed exp)		2,26,000
- Tax (59,10,000 x 25/100)		(33,900)
Net profit after tax		1,92,100

$$\text{ROI} = \frac{\text{net profit}}{\text{Investment}} \times 100$$

$$= \frac{1,92,100}{30,00,000} \times 100$$

30,00,000

= 6.4%

$ROE = \frac{NP}{Equity} \times 100$

Equity

= $\frac{1,92,100}{14,00,000} \times 100$

14,00,000

= 13.72%

26. Calculate working capital Raja & Co. has the following items in its Balance sheet Stock - 50,000; Trade creditors – 32,000; debtors – 75,000; cash – 1,00,000 Dividend payable – 50,000; Provision for Tax – 44,000; Short term loan – 61,000; Short term investments – 76,000 Calculate gross and net working capital.

Gross working capital = Sum of CA

$$= 50,000 + 75,000 + 1,00,000 + 76,000 = 3,01,000$$

Net Working capital = CA – CL

$$= 3,01,000 - 1,87,000$$

$$= 1,14,000$$

27. Discuss the concept of Operating cycle and Cash Conversion Cycle.

Ans: The duration between buying the raw material and receiving the cash from the customer is known as the —Operating Cycle. It is also referred to as the Cash Conversion Cycle.

The cash conversion cycle (CCC or Operating Cycle) is the length of time between a firm's purchase of inventory and the receipt of cash from accounts receivable. It is the time required for a business to turn purchases into cash receipts from customers. CCC represents the number of days a firm's cash remains tied up within the operations of the business.

28. Explain the factors to be considered in inventory control.

Ans: The factors to be considered in inventory control are as follows:

Space:

Space requirement for all items will not be identical; neither will it have proportionate relationship with the cost of the item. There can be many bulky items with low value as well as high value items with low volume. Good inventory control system will have to take due note of this.

Lead time:

Lead time to manufacture or procure an item depends on many factors. Combined effect of these factors like standard or special raw material, processing time, scheduling of machines, distance between source and user point etc, makes up the lead time for an item.

Standard vs made to order:

Some of the items in the inventory could be commodity items with no significant differentiation and hence easy to substitute, or many suppliers produce to same specifications and hence easy to choose from. Others may be specifically made to order and hence possibly limited sources to order from.

Seasonality of supply:

If the item is an agricultural product (grains, vegetables, fruits etc.), The supply would be seasonal. This can play a role in designing the inventory control system.

Demand not uniform or not predictable:

Demand for an item could be seasonal – weather, festival seasons, events, school opening etc can play a significant part in this. In some cases, it is easy to forecast but in others not so easy.

Shelf life:

Items like vegetables, fruits, flowers and fish are perishable in nature. This calls for special storage conditions and equipment – cold storage, freezers etc. These have financial implications. Similarly, some of the manufactured food or medicinal products have expiry dates – beyond which they are not fit for consumption. This imposes certain constraints on inventory management.

Safety aspects:

Some of the items are hazardous in nature and special precautions have to be taken in their storage. Examples are – gasoline, other combustible items, some hazardous chemicals etc. In a factory manufacturing safety matches, phosphorous and potassium chlorate are not stored in the same or even adjoining areas, for fear of accidental mix up. In fact, even their path of delivery to the respective end use points do not cross.

Obsolescence:

Due to advancement in technology, certain items may not be used and their demand drops off.