



## Paper 1: Fundamentals of Economics and Management (FEM)

### UTILITY

Utility refers to want satisfying power of a commodity.

In objective terms, utility may be defined as the “amount of satisfaction derived from a commodity or service at a particular time”.

#### Assumptions:

- ✦ The Cardinal Measurability of Utility.
- ✦ Constancy of the Marginal Utility of Money.
- ✦ No change in income of the consumer, his taste & fashion to be constant.
- ✦ Introspective Method.
- ✦ No substitute
- ✦ Hypothesis of Independent Utilities

#### Characteristics:

- ✦ Utility is subjective/not measurable
- ✦ Utility is variable
- ✦ Utility is different from usefulness
- ✦ No legal or moral connotations

#### Initial Utility

The Utility derived from the first unit of a commodity. It is always positive

#### Marginal Utility (MU)

The word Marginal means “Border” or “Edge”.

It is the addition made to the total utility by consuming one more unit of a commodity.

#### Total Utility (TU)

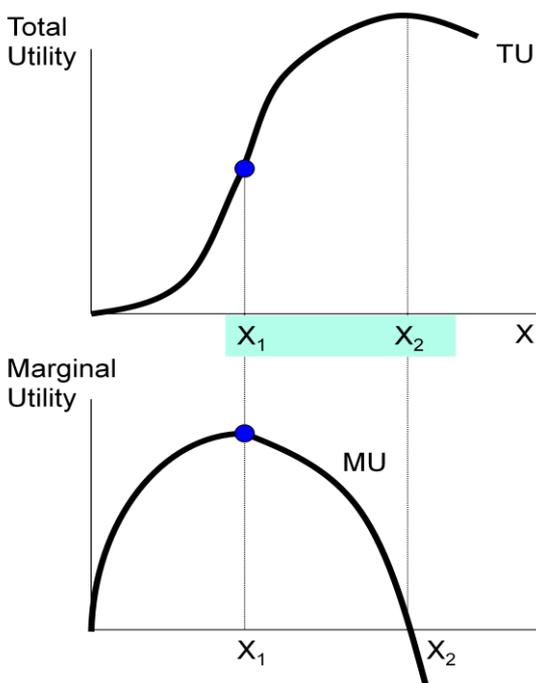
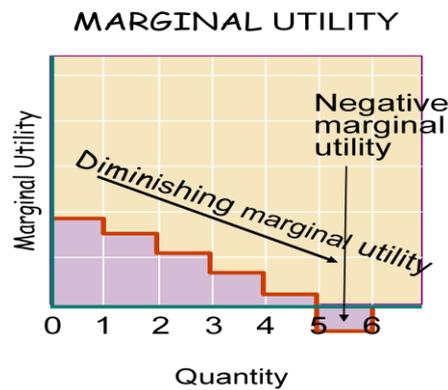
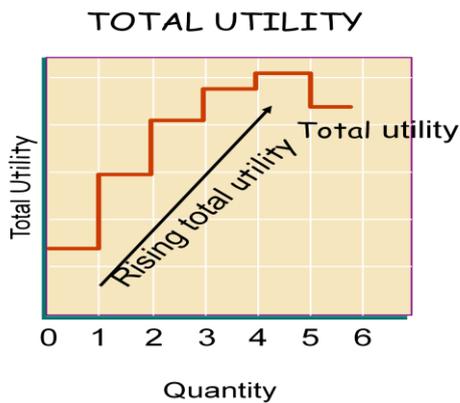
Total Utility refers to the total satisfaction derived by the consumer from the consumption of a given quantity of a good.

TU = Sum of all MU



**Calculating Marginal Utility**

Number of chocolates per week	Total Utility	Marginal Utility
1	10	
2	25	15 (25-10)
3	38	13 (38-25)
4	50	12 (50-38)
5	59	9 (59-50)
6	62	3 (62-59)



- \* As long as marginal utility is positive, total utility will increase.
- \* Total and marginal utility can be negative.
- \* Total Utility follows marginal utility.
- \* When marginal utility is zero, total utility is maximized.

This graph demonstrated the Law of Diminishing Marginal Utility.

**Law of Diminishing Marginal Utility**

Though wants of an individual are unlimited in number yet each individual want is satiable. Because of this, the more we have a commodity, the less we want to have more of it.



This law states that as the amount consumed of a commodity increases, the utility derived by the consumer from the additional units, i.e. marginal utility goes on decreasing.

**According to Marshall,** "The additional benefit a person derives from a given increase of his stock of a thing diminishes with every increase in the stock that he already has"

**Explanation:**

As more and more quantity of a commodity is consumed, the intensity of desire decreases and also the utility derived from the additional unit.

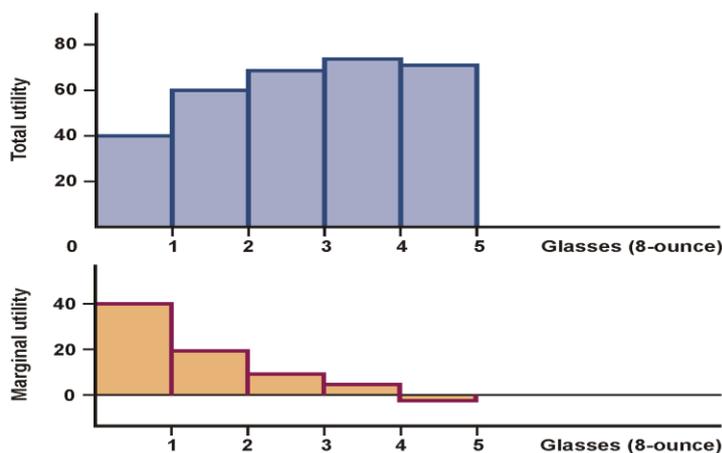
**Assumptions:**

- ✦ All the units of a commodity must be same in all respects
- ✦ The unit of the good must be standard
- ✦ There should be no change in taste during the process of consumption
- ✦ There must be continuity in consumption
- ✦ There should be no change in the price of the substitute goods

**Utility Derived from Water**

Units of Water Consumed (8 ounce glass)	Total Utility	Marginal Utility
0	0	-
1	40	40
2	60	20
3	70	10
4	75	5
5	73	-2

**Total and Marginal Utility**





### Exceptions:

- ✦ Money
- ✦ Hobbies and Rare Things
- ✦ Liquor and Music
- ✦ Things of Display

### Importance:

- \* Basis of Law of Demand
- \* Basis of 'Why Demand Curve slopes downward'

### **Law of Equi-Marginal Utility**

This law states that the consumer maximizing his total utility will allocate his income among various commodities in such a way that his marginal utility of the last rupee spent on each commodity is equal.

Or

The consumer will spend his money income on different goods in such a way that marginal utility of each good is proportional to its price

### **Law of Substitution**

A consumer will go on substituting the good yielding higher marginal utility for the good yielding lower marginal utility till such time as the marginal utility of both the goods becomes equal.

**Example:** Suppose the income is ₹ 24 and can spend on X and Y Commodities. Price of X and Y is ₹ 2 and 3 resp.

<u>Units</u>	<u>MU of X</u>	<u>MU of Y</u>
1	10	8
2	9	7
3	8	6
4	7	5
5	6	3
6	5	1

- ❖ It is difficult for the consumer to know the marginal utilities from different commodities because utility cannot be measured.
- ❖ Consumers are ignorant and therefore are not in a position to arrive at equilibrium.
- ❖ It does not apply to indivisible and inexpensive commodity.



### Consumer's Equilibrium

It refers to a situation where in a consumer gets maximum satisfaction out of limited income and he has no tendency to make any change in his existing expenditure.

Consumer will attain its equilibrium (maximum satisfaction) at the point, where marginal utility of a product divided by the marginal utility of a rupee, is equal to the price.

$$\text{Consumer's equilibrium} = \frac{\text{Marginal utility of a product}}{\text{Marginal utility of a rupee}} \\ = \text{its price}$$

#### Assumptions:

- ✦ Consumer behaviour is rational.
- ✦ Consumer behaviour is consistent.
- ✦ There are two commodities in consideration.

### Consumer Surplus

**According to Marshall:** Consumer Surplus is defined as "the excess of the price which a person would be willing to pay rather than go without the thing over that which he actually does have to pay."

This excess of satisfaction is called Consumer satisfaction and hence Consumer Surplus.

$$\text{Consumer Surplus} = \text{Total Utility} - (\text{Mkt. Price} * \text{No. of units consumed}) \\ = T.U - (P * N)$$

#### Criticisms:

- ✦ A Vague Idea
- ✦ Too many assumptions
- ✦ Applicable to a small number of cases only
- ✦ Neglects the income effect of the price change.
- ✦ Not applicable to highly superior & Giffen goods



### Paper 2: Fundamentals of Accounting (FOA)

#### COST AND COST OBJECT

**Cost units-** The Chartered Institute of Management Accountants, London, defines a unit of cost as "a unit of quantity of product, service or time in relation to which costs may be ascertained or expressed".

The forms of measurement used as cost units are usually the units of physical measurements like number, weight, area, length, value, time etc.

Following are some examples of cost unit.

<u>Industry/product</u>	<u>Cost unit basis</u>
Automobile	Numbers
Brick works	per 1000 bricks
Cement	per Tonne
Chemicals	Litre, gallon, kilogram, ton
Steel	Tonne
Sugar	Tonne
Transport	Passenger-kilometre, tonne kilometer

**Cost centre** – According to Chartered Institute of Management Accountants, London, cost centre means "a location, person or item of equipment (or group of these) for which costs may be ascertained and used for the purpose of cost control". Cost centre is the smallest organizational sub-unit for which separate cost collection is attempted. Thus cost centre refers to one of the convenient unit into which the whole factory organization has been appropriately divided for costing purposes. Each such unit consists of a department or a sub-department or item of equipment or, machinery or a person or a group of persons.

**For example**, although an assembly department may be supervised by one foreman, it may contain several assembly lines. Some times each assembly line is regarded as a separate cost centre with its own assistant foreman.

The selection of suitable cost centres or cost units for which costs are to be ascertained in an undertaking depends upon a number of factors which are listed as follows.

- ◆ Organization of the factory
- ◆ Conditions of incidence of cost
- ◆ Requirements of the costing system ie. Suitability of the units or centres for cost purposes.
- ◆ Availability of information
- ◆ Management policy regarding making a particular choice from several alternatives.



**Profit centre** – A profit centre is that segment of activity of a business which is responsible for both revenue and expenses and discloses the profit of a particular segment of activity. Profit centres are created to delegate responsibility to individuals and measure their performance.

### Difference between Profit centre and Cost centre

The various points of difference between Profit centre and cost centre are as follows. Cost centre is the smallest unit of activity or area of responsibility for which costs are collected whereas a profit centre is that segment of activity of a business which is responsible for both revenue and expenses.

- ✦ Cost centres are created for accounting conveniences of costs and their control whereas as a profit centre is created because of decentralization of operations i.e., to delegate responsibility to individuals who have greater knowledge of local conditions etc.
- ✦ Cost centers are not autonomous whereas profit centres are autonomous.
- ✦ A cost centre does not have target cost but efforts are made to minimize costs, but each profit centre has a profit target and enjoys authority to adopt such policies as are necessary to achieve its targets.
- ✦ There may be a number of cost centres in a profit centre in a profit centre as production or service cost centres or personal or impersonal but a profit centre may be a subsidiary company within a group or division in a company.

### Cost classification

Costs can be classified or grouped according to their common characteristics. Proper classification of costs is very important for identifying the costs with the cost centers or cost units. The same costs are classified according to different ways of costing depending upon the purpose to be achieved and requirements of a particular concern. The important ways of classification are:

1. **By Nature or Elements:** According to this classification the costs are classified into three categories i.e., Materials, Labour and Expenses. Materials can further be sub-classified as raw materials components, spare parts, consumable stores, packing materials etc. This helps in finding the total cost of production and the percentage of materials (labour or other expenses) constituted in the total cost. It also helps in valuation of work-in-progress.
2. **By Functions:** This classification is on the basis of costs incurred in various functions of an organization ie. Production, administration, selling and distribution. According to this classification, costs are divided into Manufacturing and Production Costs and Commercial costs.

**Manufacturing and Production Costs** are costs involved in manufacture, construction and fabrication of products.

**Commercial Costs** are (a) administration costs (b) selling and distribution costs.



3. **By Degree of Traceability to the Product** : According to this, costs are divided into direct costs and indirect costs. **Direct Costs** are those costs which are incurred for a particular product and can be identified with a particular cost centre or cost unit. Eg:- Materials, Labour. **Indirect Costs** are those costs which are incurred for the benefit of a number of cost centres or cost units and cannot be conveniently identified with a particular cost centre or cost unit. Eg:- Rent of Building, electricity charges, salary of staff etc.
4. **By Changes in Activity or Volume**: According to this costs are classified according to their behavior in relation to changes in the level of activity or volume of production. They are fixed, variable and semi-variable. **Fixed Costs** are those costs which remain fixed in total amount with increase or decrease in the volume of the output or productive activity for a given period of time. Fixed Costs per unit decreases as production increases and vice versa. Eg:- rent, insurance of factory building, factory manager's salary etc. **Variable Costs** are those costs which vary in direct proportion to the volume of output. These costs fluctuate in total but remain constant per unit as production activity changes. Eg:- direct material costs, direct labour costs, power, repairs etc. **Semi-variable Costs** are those which are partly fixed and partly variable. For example; Depreciation, for two shifts working the total depreciation may be only 50% more than that for single shift working. They may change with comparatively small changes in output but not in the same proportion.
5. **Association with the Product**: Cost can be classified as product costs and period costs. Product costs are those which are traceable to the product and included in inventory cost, thus product cost is full factory cost. Period costs are incurred on the basis of time such as rent, salaries etc. thus it includes all selling and administration costs. These costs are incurred for a period and are treated as expenses.
6. **By Controllability**: The **CIMA** defines controllable cost as "a cost **which can be** influenced by the action of a specified member of an undertaking" and a non-controllable cost as "a cost which cannot be influenced by the action of a specified member of an undertaking".
7. **By Normality**: There are normal costs and abnormal costs. Normal costs are the costs which are normally incurred at a given level of output under normal conditions. Abnormal costs are costs incurred under abnormal conditions which are not normally incurred in the normal course of production. Eg:- damaged goods due to machine break down, extra expenses due to disruption of electricity, inefficiency of workers etc.
8. **By Relationship with Accounting Period**: There are capital and revenue expenses depending on the length of the period for which it is incurred. The cost which is incurred in purchasing an asset either to earn income or increasing the earning capacity of the business is called capital cost, for example, the cost of a machine in a factory. Such cost is incurred at one point of time but the benefits accruing from it are spread over a number of accounting years. The cost which is incurred for maintaining an asset or running a business is revenue expenditure. Eg:- cost of materials, salary and wages paid, depreciation, repairs and maintenance, selling and distribution.
9. **By Time**: Costs can be classified as 1) Historical cost and 2) Predetermined Costs.



The costs which are ascertained and recorded after it has been incurred is called historical costs. They are based on recorded facts hence they can be verified and are always supported by evidences. Predetermined costs are also known as estimated costs as they are computed in advance of production taking into consideration the previous periods' costs and the factors affecting such costs. Predetermined costs when calculated scientifically become standard costs. Standard costs are used to prepare budgets and then the actual cost incurred is later-on compared with such predetermined cost and the variance is studied for future correction.

### Types, Methods and Techniques of Costing

The general fundamental principles of ascertaining costs are the same in every system of cost accounting, but the methods of analysis and presenting the costs vary from industry to industry. Different methods are used because business enterprises vary in their nature and in the type of products or services they produce or render. Basically, there are two principal methods of costing, namely (i) Job Costing, and (ii) Process costing.

- 1. Job costing:** It refers to a system of costing in which costs are ascertained in terms of specific jobs or orders which are not comparable with each other. Industries where this method of costing is generally applied are Printing Process, Automobile Garages, Repair Shops, Ship building, House building, Engine and Machine construction, etc. Job Costing includes the following methods of costing:
  - (a) Contract Costing:** Although contract costing does not differ in principle from job costing, it is convenient to treat contract cost accounts separately. The term is usually applied to the costing method adopted where large scale contracts at different sites are carried out, as in the case of building construction.
  - (b) Batch Costing:** This method is also a type of job costing. A batch of similar products is regarded as one job and the cost of this complete batch is ascertained. It is then used to determine the unit cost of the articles produced. It should, however, be noted that the articles produced should not lose their identity in manufacturing operations.
  - (c) Terminal Costing:** This method is also a type of job costing. This method emphasizes the essential nature of job costing, ie, the cost can be properly terminated at some point and related to a particular job.
  - (d) Operation Costing:** This method is adopted when it is desired to ascertain the cost of carrying out an operation in a department, for example, welding. For large undertaking, it is frequently necessary to ascertain the cost of various operations.
- 2. Process Costing:** Where a product passes through distinct stages or processes, the output of one process being the input of the subsequent process, it is frequently desired to ascertain the cost of each stage or process of production. This is known as process costing. This method is used where it is difficult to trace the item of prime cost to a particular order because its identity is lost in volume of continuous production. Process costing is generally adopted in textile industries, chemical industries, oil refineries, soap manufacturing, paper manufacturing, tanneries, etc.



3. **Unit or single or output or single output costing:** This method is used where a single article is produced or service is rendered by continuous manufacturing activity. The cost of the whole production cycle is ascertained as a process or series of processes and the cost per unit is arrived at by dividing the total cost by the number of units produced. The unit of costing is chosen according to the nature of the product. Cost statements or cost sheets are prepared under which various items of expenses are classified and the total expenditure is divided by total quantity produced in order to arrive at unit cost of production. This method is suitable in industries like brick-making, collieries, flour mills, cement manufacturing, etc. this method is useful for the assembly department in a factory producing a mechanical article eg. Bicycle.
4. **Operating Costing:** This method is applicable where services are rendered rather than goods produced. The procedure is same as in the case of single output costing. The total expenses of the operation are divided by the units and cost per unit of services is arrived at. This method is employed in Railways, Road Transport, Water supply undertakings, Telephone services, Electricity companies, Hospital services, Municipal services, etc.
5. **Multiple or Complete Costing:** Some products are so complex that no single system of costing is applicable. It is used where there are a variety of components separately produced and subsequently assembled in a complex production. Total cost is ascertained by computing component costs which are collected by job or process costing and then aggregating the costs through use of the single or output costing system. This method is applicable to manufacturing concerns producing Motor Cars, Aeroplanes, Machine tools, Type-writers, Radios, Cycles, Sewing Machines, etc.
6. **Uniform Costing:** It is not a distinct method of costing by itself. It is the name given to a common system of costing followed by a number of firms in the same industry. This helps in comparing performance of one firm with that of another.
7. **Departmental Costing:** When costs are ascertained department by department, the method is called "Departmental Costing". Usually, for ascertaining the cost of various goods or services produced by the department, the total costs will have to be analysed, say, by the use of job costing or unit costing.  
In addition to the above methods of costing, mention can be made of the following techniques of costing which can be applied to any one of the above method of costing for special purposes of cost control and policy making:
  - (a) **Standard or Predetermined Costs.**
  - (b) **Marginal Costs**



## Paper 3: Fundamentals of Laws and Ethics (FLE)

### Business Ethics

#### Concept of Business Ethics

Business ethics refers to moral as well as behavioral codes of conduct that every individual working with an organization must follow. It probes moral and ethical principles and problems arising in the business environment. The ethical issues are concerned with various negative aspects, such as corruption and fraud in an organization. The organizations started taking interest in business ethics during 1980s and 1990s. There are many organizations that emphasize the implementation of ethical codes, social responsibility, and environmental concerns.



#### Importance of Business Ethics

Business ethics comprises various traits, such as trustworthiness and transparency in customer services. Ethical business practices strengthen customer relationship that is of prime importance for long-term organizational success. It deals with retaining and creating a long-lasting impression in the minds of customers. Such impressions help the organization to win the trust of customers and get more business. Business ethics plays a very crucial role in various management functions, which are given as follows:



✦ **Ethics in Finance:** Deals with various ethical dilemmas and violations in day-to-day financial transactions. An example of ethical violations is data fudging in which organizations present a fabricated statement of accounts and other records, which are open to investigation. Ethics in financial transactions gained importance when due to their insufficiency nations suffered massive economic meltdowns. The following are the ethics in finance:

- Following truthfulness and authenticity in business transactions
- Seeking the fulfillment of mutual interests
- Getting the economies and financial units freed from greed-based





methodologies

✚ **Ethics in Human Resource Management:** Deals with the enforcement of the rights of employees in an organization. Such rights are as follows:

- Having a right to work and be compensated for the same
- Possessing a right for free association and participation
- Enjoying a right for fair treatment in an organization
- Holding a right to work in a hazard-free environment
- Blowing whistle (an activity where an employee can raise voice against any wrong practice of anyone in an organization)



✚ **Ethics in Marketing:** Deals with a number of issues, which are as follows:

- Misinforming the customers about the products or services
- Deciding high prices for the products and services
- Creating false impression on the customers/consumers about the features of products
- Promoting sexual attitudes through advertising; thus, affecting the young generation and children



✚ **Ethics in Production:** Deals with the responsibility of an organization to make sure that products and processes of production are not causing harm to the environment. It throws light on the following issues:

- Avoiding rendering services or producing products that are hazardous to health. For example, tobacco and alcohol
- Maintaining ethical relations with the environment and avoiding environmental pollution

### Ethics and the Indian Corporate Culture

Ethics in India is based on a number of scriptures, thoughts, ideas, and Vedas. In India, the organizational culture is divided into two broad divisions, namely professional culture and community culture. The professional culture helps the employees to maintain a certain acceptable level of discipline in the organization. The community culture of an organization emerges from the varied cultural backgrounds to which its employees belong. One important aspect of organizational community culture is that the beliefs and views of any particular culture or religion should not alienate any individual belonging to another culture. The Indian corporate culture has borrowed many ethical values that have been taught by Indian scriptures. Some of these ethical values are as follows:

✚ **Respect:** Means that every individual should have respect for the beliefs and values of other individuals. In a multiethnic country as India, the people should respect each other's views, beliefs, and ideas to maintain good mutual relationships.

✚ **Trust:** Means that the employees of an organization should cultivate mutual trust and faith in each other.



Doubts may create misunderstandings, problems, and chaos among individuals, and thus need to be avoided. Such doubts can be solved by placing trust in each other to facilitate a better working of an organization.

- ✦ **Spirituality:** Emphasizes the positive inner transformation of an individual's life. An individual performs efficiently and feels satisfied at workplace when he/she is in peaceful and contented frame of mind. Now-a-days, the organizations are realizing the importance of spirituality, contemplation, meditation, and yoga practices, which are the essence of the Indian culture. Such practices help people to lead a more sensible life, increase work efficiency, and decrease stress levels.
- ✦ **Tolerance:** Helps to maintain cordial relationships among the employees of an organization. Tolerance refers to increase in the level of adaptability of an employee to various organizational changes. The individuals need to be permissible and receptive to the challenges of their work. They should accept people as they are without judging them.
- ✦ **Flexibility:** Refers to the degree at which an individual can adapt with the surroundings in the organizational environment. It takes into account the receptive and adaptive nature of an individual towards fellow employees and assigned tasks.
- ✦ **Sincerity:** Refers to truthfulness and transparency in the nature and behavior of employees in an organization. It also necessitates an honest code of conduct in an organization.
- ✦ **Patience:** Refers to the degree at which the individuals can tolerate any delays in the fulfillment of their wishes or goals. Individuals with high degree of patience are not affected by delays in getting rewards for their accomplished tasks.
- ✦ **Perseverance:** Refers to the quality of an individual to not to give up soon and keep on trying for achieving goals. Individuals with perseverance can keep their spirits high to achieve the desired goals.

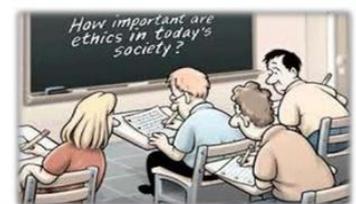
### Causes and Issues of Unethical Behavior

Unethical behavior refers to the behavior of people that do not conform with the acceptable standards of social and professional behavior. Such behavior may include making long-distance calls from the office, duplicating the organization's system software to use at home, projecting a false report on the number of worked hours, or falsifying business records.

There can be numerous factors that cause unethical behavior in the employees of an organization. Such factors are as follows:

## CAUSES

## CAUSES OF UNETHICAL BEHAVIOUR





- ✦ **Primary Factors:** Refer to the factors that comprise external stimuli and compel people to move in a particular direction without thinking about ethical parameters. For example, obedience to authority is a primary concept that affects the ethical mindset of an individual. Children tend to obey their parents right from the time when they do not know anything about ethics. This makes their every act conditioned to their parents' teachings and orders. This mindset of children continues right from their school time. As a result, when an authoritative person orders the individual to do an unethical act, he/she tends to obey him/her as well. This happens due to the conditioning of their mind to obey orders right from their childhood.
- ✦ **Personality Factors:** Refer to the prominent characteristics of an individual. If these characteristics of an individual are negative then they are reflected in his/her behavior. For example, if a person has a prominent characteristic of being late to the office regularly then indiscipline is he/she personality factor.
- ✦ **Defensive Factors:** Refers to the attempts of an individual to find easy ways to escape from an act of violation of a law or a duty. Generally, the defensive factors are the maneuvers caused by two basic internal stimuli, which are guilt and shame. These two stimuli force individuals to lie, or draw a false consensus of others to cover their mistakes.

The aforementioned factors can be dealt with the help of following techniques:

- Appointing a psychologist or consultant to help the employees deal with the strong emotions that force them to indulge in an unethical behavior
- Ensuring that the employees know about common psychological factors of unethical behavior and the ways to deal with them
- Recognizing the factors that cause unethical behavior; thus, finding the ways to tackle the same





## Paper 4: Fundamentals of Business Mathematics and Statistics (FBMS)

### Interest (An Introduction)

Interest: how much is paid for the use of money (as a percent, or an amount)



#### Money is Not Free to Borrow

People can always find a use for money, so it **costs to borrow money**.

#### How Much does it Cost to Borrow Money?

Different places charge different amounts at different times!

But they usually charge this way:

%	As a percent (per year) of the amount borrowed	%
It is called <b>Interest</b>		

Example: Borrow ₹1,000 from the Bank



Alex wants to borrow ₹1,000. The local bank says "**10% Interest**". So to borrow the ₹1,000 for 1 year will cost:

$$₹1,000 \times 10\% = ₹100$$

In this case the "Interest" is ₹100, and the "Interest Rate" is 10% (but people often say "10% Interest" without saying "Rate")

Of course, Alex will have to pay back the original ₹1,000 after one year, so this is what happens:



**Alex Borrows ₹1,000, but has to pay back ₹1,100**



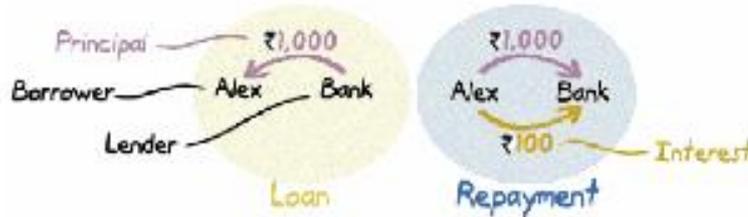
This is the idea of Interest ... paying for the use of the money.



Note: I am showing a full year loan, but banks often want you to pay back the loan in small monthly amounts, and they also charge extra fees too!

### Words

There are special words used when borrowing money, as shown here:



Alex is the **Borrower**, the Bank is the **Lender**

The **Principal** of the Loan is ₹1,000

The **Interest** is ₹100

The important part of the word "Interest" is Inter- meaning between (you see inter- in words like interior and interval), because the interest happens between the start and end of the loan.

### More Than One Year ...

What if Alex wanted to borrow the money for 2 Years?

### Simple Interest

If the bank charges "Simple Interest" then Alex just pays another 10% for the extra year.



Alex pays Interest of  $(₹1,000 \times 10\%) \times 2 \text{ Years} = ₹200$

That is how simple interest works ... pay the same amount of interest every year.

Example: Alex borrows ₹1,000 for 5 Years, at 10% simple interest:

- Interest =  $₹1,000 \times 10\% \times 5 \text{ Years} = ₹500$
- Plus the Principal of ₹1,000 means Alex needs to pay ₹1,500 after 5 Years

There is a formula for simple interest

$$I = Prt$$

where

- I = interest
- P = amount borrowed (called "Principal")
- r = interest rate
- t = time



Like this:

Example: Jan borrowed ₹3,000 for 4 Years at 5% interest rate, how much interest is that?

$$I = Prt$$

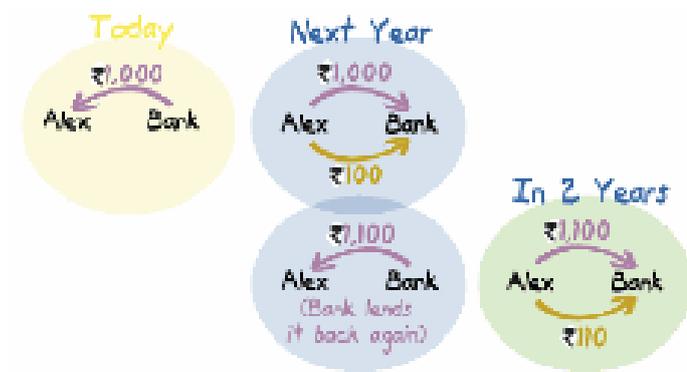
$$I = ₹3,000 \times 5\% \times 4 \text{ years}$$

$$I = 3000 \times 0.05 \times 4$$

$$I = ₹600$$

### Compound Interest

But the bank says "If you paid me everything back after one year, and then I loaned it to you again ... I would be loaning you **₹1,100 for the second year!**"



And Alex would pay **₹110** interest in the second year, not just ₹100.

**Because Alex is paying 10% on ₹1,100 not just ₹1,000**

This may seem unfair ... but imagine YOU were lending the money to Alex. After a year you think "Alex owes me ₹1,100 now, and is still using my money, I should get more interest!"

And so this is the normal way of calculating interest. It is called **compounding**.

With **compounding** we work out the interest for the first period, add it the total, and **then** calculate the interest for the next period, and so on ..., like this:



It is like paying interest on interest: after a year Alex owed ₹100 interest, the Bank thinks of that as another loan and charges interest on it, too.

After a few years it can get really large. This is what happens on a 5 Year Loan:



Year	Loan at Start	Interest	Loan at End
0 (Now)	₹1,000.00	(₹1,000.00 × 10% = ) <b>₹100.00</b>	₹1,100.00
1	₹1,100.00	(₹1,100.00 × 10% = ) <b>₹110.00</b>	₹1,210.00
2	₹1,210.00	(₹1,210.00 × 10% = ) <b>₹121.00</b>	₹1,331.00
3	₹1,331.00	(₹1,331.00 × 10% = ) <b>₹133.10</b>	₹1,464.10
4	₹1,464.10	(₹1,464.10 × 10% = ) <b>₹146.41</b>	₹1,610.51
5	₹1,610.51		

So, after 5 Years Alex would have to pay back **₹1,610.51**

**And the Interest for the last year was ₹146.41 ... it sure grew quickly!**

(Compare that to the Simple Interest of only ₹100 each year)

### What is Year 0?

**Year 0** is the year that starts with the "Birth" of the Loan, and ends just before the 1st Birthday.

Just like when a baby is born its age is **zero**, and will not be 1 year old until the first birthday.

So the start of **Year 1** is the "1st Birthday". And we can know the **start of Year 5** is exactly when the loan is 5 Years Old.

### In Summary:

To calculate compound interest, work out the interest for the first period, add it on, and then calculate the interest for the next period, etc.

(There are quicker methods, see [Compound Interest](#) )

### Why Borrow?

Well ... you may want to buy something you like. Paying it back will end up costing you more though.

But a business may be able to use the money to make **even more** money.



Example: Chicken Business

You borrow ₹1,000 to start a chicken business (to buy chicks, chicken food and so on).

A year later you sell the grown chickens for ₹1,200.

You pay back the bank ₹1,100 (the original ₹1,000 plus 10% interest) and you are left with **₹100 profit**.

**And you used someone else's money to do it!**



But ... be careful. What if you only sold the chickens for ₹800? ... you would still have to pay the bank ₹1,100 and would face a **₹300 loss**.

## Investment

Compound Interest can **work for you!**

**Investment** is where you put money so it **could grow**, such as a bank, or a business.

If you invest your money at a good interest rate it can grow very nicely.

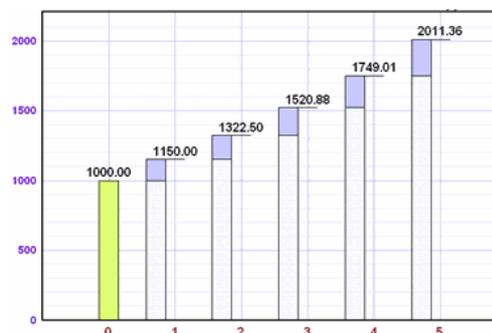
This is what 15% interest on ₹1,000 can do:

Year	Loan at Start	Interest	Loan at End
0 (Now)	₹1,000.00	(₹1,000.00 × 15% = ) <b>₹150.00</b>	₹1,150.00
1	₹1,150.00	(₹1,150.00 × 15% = ) <b>₹172.50</b>	₹1,322.50
2	₹1,322.50	(₹1,322.50 × 15% = ) <b>₹198.38</b>	₹1,520.88
3	₹1,520.88	(₹1,520.88 × 15% = ) <b>₹228.13</b>	₹1,749.01
4	₹1,749.01	(₹1,749.01 × 15% = ) <b>₹262.35</b>	₹2,011.36
5	₹2,011.36		

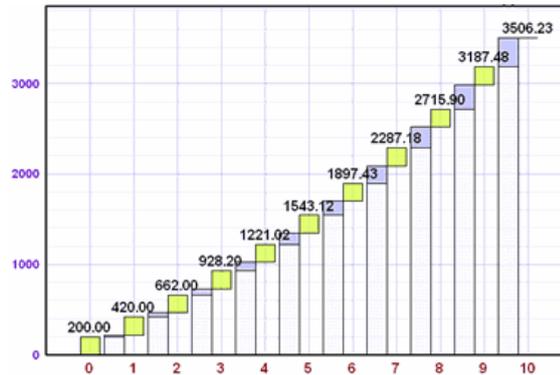
**It more than doubles in 5 Years!**

An investment at 15% is not likely to be safe (see [Investing introduction](#)) ... but it does show you the power of compounding.

The graph of that investment looks like this:



Maybe you don't have ₹1,000? Here is what saving ₹200 every year for 10 Years at 10% interest can do:



**₹3,506.23** after 10 Years!  
For 10 Years of ₹200 each year.

### Less Than One Year...

Interest is not always charged yearly. It can be charged Semi-annually (every 6 months), Monthly, even Daily!

But the same rules apply:

- If it is simple interest, just work out the interest for one period, and multiply by the number of periods.
- If it is compound interest, work out the interest for the first period, add it on and then calculate the interest for the next period, etc.

