CHAPTER ONE
LOGIC AND PHILOSOPHY

- *"Unexamined life is not worth living!"* ***Socrates***
- *"Philosophy begins with wonder at the marvels and mysteries of the world."* ***Aristotle***

1. Definition of Philosophy

1.1 Etymological Definition of Philosophy

The word "philosophy" is etymologically derived from the Greek word *philosophia*, which, in turn, is derived from two Greek words – *Philos*=Love and *Sophia*=Wisdom. Thus, philosophy means *the love of wisdom*. Here, **"wisdom"** refers to ***Truth*** and ***knowledge*** of any theoretical sort, not technical skills. As used **originally** by the ancient Greeks, the term "philosophy" meant **the pursuit of knowledge for its own sake**, and comprised **ALL** areas of speculative thought, including **the arts, sciences and religion**. The very first philosophers, in ancient Greece, were thinkers who were not satisfied with the established explanations provided by religion and custom, and sought answers which had rational justifications.

1.2 Convectional Definition of Philosophy

Philosophy is the study of general and fundamental questions about existence, knowledge, truth, value (ethics), beauty (art), law, justice, mind, and language based on logical reasoning rather than empirical methods, such as observation, data collection and experiment.

Prior to the emergence of *Specializations*, no distinction was made between philosophy and other disciplines. Mathematics, physics, biology, astronomy, medicine, ethics, psychology, sociology, political science, economics, law, art, epistemology, metaphysics, logic, etc were all belonged to the same family – **Philosophy**. In the beginning, then, all systematic search for knowledge was Philosophy. This fact is still reflected in the modern universities, where the highest degree granted in all of the sciences and humanities is the PhD – the Doctor of Philosophy. Moreover, the well-known physicist, Newton, titled his work of physics as "*Mathematical Principles of Natural Philosophy*" published in1687. By developing experimental techniques of their own starting from the 16th C, these disciplines began to leave home, Philosophy. First to leave were *Physics* and *Astronomy* led by Galileo (1564-1642), Isaac Newton (1642-1727) and Johannes Kepler (1571-1630) …Eventually, *Psychology* left home.[1] Philosophy is now left with its foundational branches, such as Metaphysics, Epistemology, Ethics, Aesthetics and Logic.

[1] Lousis P. Pojman. 2006. ***Philosophy: The Quest for Truth***. Oxford: Oxford University Press, 6th ed., p.3

2. The Contributions of Philosophy to Human Civilization

3. Basic Features of Philosophy

i) *Philosophy is a set of views or beliefs about life and the universe, which are often held uncritically.*

We refer to this meaning as the informal sense of philosophy or "having" a philosophy. Usually when a person says "my philosophy is," he or she is referring to an informal personal attitude to whatever topic is being discussed.

ii) *Philosophy is a process of reflecting on and criticizing our most deeply held conceptions and beliefs.*

This is the formal sense of "doing" philosophy. Philosophers are reflective and critical. It means they take a second look at the material presented by the common sense (the apparent). Philosophers believe that the apparent is not the ultimate reality of things. The ultimate reality is covered by the common sense (the apparent perception). For example, when a man falls in love with a woman; he justifies the causes of his love as "because of her beauty", or "because of her character", etc. Such justification is an apparent perception of what the lover feels. In his *Symposium*, Plato, however, uncovered the apparent feelings of love and reached at the ultimate reality of love as *the instinct for union and the desire for eternity through offspring*. Philosophy is thus to pass the sense perception (the cover of the egg) and penetrate deep into its fundamental reality (the yolk of the egg).

> *"The person who has no tincture of philosophy goes through life imprisoned in the prejudices derived from the common sense, from the habitual beliefs of his age or his nation, and from convictions which have grown up in his mind without the co-operation or consent of his deliberate reason."*[2] Bertrand Russell

iii) *Philosophy is a rational attempt to look at **the world as a whole**, **the human as a whole**.*

Philosophy seeks to combine the conclusions of the various sciences and human experience into some kind of consistent worldview. Philosophers wish to see life, not with the specialized slant

[2] Bertrand Russell. 1912. *Problem of Philosophy.* p. 158

of the scientist or the businessperson or the artist, but with the overall view of someone cognizant of life as a totality.

Although there are difficulties and dangers in setting forth any worldview, there also are dangers in confining attention to fragments of human experience. Philosophy's task is to give a view of the whole, a life and a worldview, and to integrate the knowledge of the sciences with that of other disciplines to achieve a consistent whole. Philosophy, according to this view, attempts to bring the results of human inquiry- religious, historical, and scientific into some meaningful interpretation that provides knowledge and insight for our lives.

iv) Philosophy is the logical analysis of language and the clarification of the meaning of words and concepts.

Philosophy does this task in its specialized field called ***Logic,*** and ***Philosophy of Language***.

v) Philosophy is a group of perennial problems that interest people and for which philosophers always have sought answers.

The content of philosophy is better seen as *asking the right questions rather than providing the correct answers*. It even can be said that philosophy is the *study of questions*. The following are perennial questions of life and philosophy:

- What is truth?
- What is life and why am I here? What is the ultimate goal/purpose of human life?
- Why is there something rather than nothing?
- What is the place of life in this great universe?
- Is the universe friendly or unfriendly? Rational or irrational?
- Do things operate by chance or through sheer mechanism, or
- Is there some plan, purpose, or intelligence at the heart of things, the universe?
- Is my life controlled by outside forces, or do I have a determining or even a partial degree of control?
- Why do people struggle and strive for their rights, for justice, for better things in the future?
- What do concepts like "right" and "justice" means, and what are the marks of a good society?

- Often men and women have been asked to sacrifice their lives, if need be, for certain values and ideals. What are the genuine values of life and how can it attained?
- Is there really a fundamental distinction between right and wrong, or is it just a matter of one's own opinions?
- What is beauty? What is love? What is art? What makes an artwork an art?
- Should religion count in a person's life?
- Is it intellectually valid to believe in God?
- Is there a possibility of a "life after death?"
- Where does knowledge come from? What is its scope? How concepts are formed? What is the relationship between the concept and the reality?

The above questions are all philosophical. The attempt to seek answers or solutions to them has given rise to theories and systems of thought, such as idealism, realism, pragmatism, analytic philosophy, existentialism, phenomenology, capitalism, socialism.

4. Core Fields of Philosophy

Philosophy has different primary and secondary branches. This chapter deals only with the primary ones.

- **Primary branches of Philosophy** – They are six, namely Metaphysics, Epistemology, Ethics, Aesthetics (philosophy of art), Political Philosophy and Logic. Other scholars consider philosophy of religion as primary branches of philosophy.
- **Secondary branches of Philosophy** – Philosophy of religion, philosophy of language, philosophy of education, philosophy of physics, philosophy of mathematics, philosophy of medicine, philosophy of biology, philosophy of science, philosophy of technology, philosophy of psychology, philosophy of history, environmental ethics, biomedical ethics, etc.

4.1 Metaphysics

Metaphysics is the branch of philosophy that studies the ultimate nature of reality or existence. It deal with issues of reality, God, freedom, soul/immortality, the mind-body problem, form and substance relationship, cause and effect relationship, and other related issues. Metaphysicians seek an irreducible foundation of reality or 'first principles' from which absolute knowledge or truth can be induced and deduced. The term *metaphysics* is derived from the Greek *words*

"meta" means ("beyond", "upon" or "after") *and physika*, means ("physics"). Literally, it refers 'those things after the physics.' Aristotle's writings on 'first philosophy' came after his treatise on physics, therefore, Aristotle's editor, Andronicus of Rhodes, named them metaphysics.

Metaphysical questions are the most basic to ask because they provide the foundation upon which all subsequent inquiry is based; i.e., all other branches of philosophy are founded on metaphysics. Metaphysical questions may be divided into four subsets or aspects.

i) ***Cosmological Aspect*:** Cosmology consists in the study of theories about the origin, nature, and development of the universe as an orderly system. Questions such as these populate the realm of cosmology:
   - *How did the universe originate and develop? Did it come about by accident or design? Does its existence have any purpose?*
   - *Is there a cause and effect relationship between reality and appearance?*
   - *What is the ultimately real? And, what is the nature of the ultimate reality?*
   - *Is reality one thing or is it many different things?*
   - *Can reality be grasped by the senses, or it is transcendent?*
   - *What makes reality different from a mere appearance?*
   - *What is time? Is its existence subjective or objective?*

ii) ***Theological Aspect:*** Theology is that part of religious theory that deals with conceptions of and about God.
   - *Does God exist, and if so, can we prove it? Is it one or more than one?*
   - *What are the attributes of God? Is He a moral being?*
   - *If God is both all good and all powerful, why does evil exist?*
   - *If God exists, what is His relationship to human beings and the 'real' world of everyday life?"*

iii) ***Anthropological Aspect:*** Anthropology deals with the study of human beings and asks questions like the following:
   - *What is human being? A thinking mind? A perishable body? Or a combination of both?*
   - *What is the relation between mind and body?*

- *Is mind more fundamental than body, with body depending on mind, or vice versa?*
- *What is humanity's moral status? Are people born good, evil, or morally neutral?*
- *To what extent are individuals free? Do they have free will, or are their thoughts and actions determined by their environment, inheritance, or a divine being?*
- *What is the meaning and purpose of life?*
- *Does each person have a soul? If so, what is it? People have obviously adopted different positions on these questions, and those positions influence their political, social, religious, and educational ideals and practices.*

iv) ***Ontological Aspect:*** Ontology is the study of the nature of existence, or what it means for anything to exist. Several questions are central to ontology:

- *Is basic reality found in matter/physical energy (the world we can sense), or is it found in spirit or spiritual energy? Is it composed of one element (e.g., matter or spirit), or two (e.g., matter and spirit), or many?"*
- *Is reality orderly and lawful in itself, or is it merely orderable by the human mind? Is it fixed and stable, or is change its central feature? Is this reality friendly, unfriendly, or neutral toward humanity?"*

4.2 Epistemology

Epistemology is the other field of philosophy that studies about the nature, scope, meaning, and possibility of knowledge. It deals with issues of knowledge, opinion, truth, falsity, reason, experience, and faith. Epistemology is also referred to as "theory of knowledge".

Etymologically, the word epistemology has been derived from two Greek words ***episteme***=, knowledge, and ***logos***=study. Hence, epistemology is the study of knowledge. In more detail, we can say that Epistemology is the study of the nature, source, scope and validity of knowledge. It seeks to answer of the basic questions as "What is true?" and "How do we know it?" Thus, epistemology covers two areas: the *content* of thought and *thought* itself. The study of epistemology deals with the validity of the sources through which we gain information.

The following are among the questions/issues with which Epistemology deals:

- *What is knowledge? And, what does it mean to know?*

- *What is the source of knowledge? Experience? Reason? Or both?*
- *How can we be sure that what we perceive through our senses is correct?*
- *What makes knowledge different from belief or opinion?*
- *What is truth, and how can we know a statement is true?*
- *Can reason really help us to know phenomenal things without being informed by sense experiences?*
- *Can our sense experience really help us to know things beyond our perception without the assistance of our reasoning ability?*
- *What is the relationship and difference between faith and reason?*
- *How are concepts formed in the mind? And, what is the relationship between the concept and the external world?*

Schools of Epistemology

On the question of "What is the source of knowledge?" four schools are emerged: ***Empiricism, Rationalism, Intuitionism and Revelation***. Of which only the first two – Empiricism and Rationalism – are philosophical schools of Epistemology.

1) **Empiricism.** Empiricists argue that:
    - Knowledge is obtained by the senses and experience, and the information obtained by the senses are real and reliable.
    - Sensation is thus not illusion. What appears to us is real. There is no difference between appearance and reality.
    - Mental images/contents (ideas) are real representatives of the external world.
    - At birth, the human mind is a *blank slate* to be written by experience afterwards.
    - In the contemporary world, knowledge obtained empirically is generally seen as the most basic and reliable type, for it uses *empirical research methods*, such as observation, data collection and experimentation.

Limitations of the Sensation

Fatigue, frustration, illness and the change of medium distort and limit sensory perception. When a stick, for example, submerged into water, it appears as bent and shortened. Moreover, there are wave lengths (for example, X-ray) and frequencies which have huge effect on our life, but that we cannot see and hear them with our naked eyes and ears. Scientists have invented scientific instruments to extend the range of the capability of our senses.

2) **Rationalism.** Rationalists argue that:
    - Knowledge is obtained through reason/logic, not the senses.

- The senses may deceive us, and sensations are meaningless raw data.
- They didn't deny the role of sensations. What they argue is that the sensations and experiences humans obtain through their senses are the *raw material* of knowledge. These sensations must be organized by the mind into a meaningful system before they become knowledge.
- Hence, the mind at birth is *not a blank slate*, but contented with mental categories/software to process, organize and interpret raw sense data.
- Our mind has no direct access to the external world, but mediated through mental images (ideas). So, what we know is ***not*** the external world but its mental representation.

3) **Intuition.** It's the direct apprehension of knowledge that is not derived from conscious reasoning or immediate sense perception. Intuition occurs beneath the threshold of consciousness and is often experienced as a *sudden flash of insight*. Intuition has been claimed under varying circumstances as a source of both religious and secular knowledge. Certainly many scientific breakthroughs have been initiated by intuitive hunches that were confirmed by experimentation. The weakness or danger of intuition is that it does not appear to be a safe method of obtaining knowledge when used alone.

4) **Revelation**. Revealed knowledge has been of prime importance in the field of religion. It differs from all other sources of knowledge because it presupposes a transcendent supernatural power that breaks into the natural order. Christians and Muslims believe that such revelation is God's communication concerning the divine will. Its limitation is generally realized that distortion of revealed truth can occur in the process of human interpretation. Some people assert that a major disadvantage of revealed knowledge is that it must be accepted by faith and cannot be proved or disproved empirically.

4.3 Ethics (Moral Philosophy)

Ethics deals with the philosophical study of moral principles, values, codes, and rules, which may be used as standards for determining what kind of human conduct/action is said to be good or bad, right or wrong. Ethics has three main branches. Ethics raises various questions including:

- *What is good/bad?*
- *What is right/wrong?*
- *Is it the Right Principle or the Good End that makes human action/conduct moral?*
- *Is an action right because of its good end, or it is good because of its right principle?*
- *Are moral principles universal, objective, and unconditional, or relative, subjective and conditional?*

- *What is the ultimate foundation of moral principles? The supernatural God? Human reason? Mutual social contract? Social custom?*
- *Does God exist? If so, is He Benevolent and Omnipotent?*
- *If God is Benevolent, why He creates evil things? If God does not create evil things, then, there must be another creator who is responsible to creation of the evil things? But, if it is so, how can God be an Omnipotent creator?*
- *Why we honor and obey moral rules? For the sake of our own individual benefits? or for the sake of others?, or just for the sake of fulfilling our infallible duty?*

Ethics, or ethical studies, can be grouped into three broad categories: *Normative ethics, Meta-ethics,* and *Applied Ethics.*

Normative Ethics refers to the ethical studies that attempt to study and determine precisely the moral rules, principles, standards and goals by which human beings might evaluate and judge the moral values of their conducts, actions and decisions. Here, there are three schools of Normative Ethics:

i. *Consequentialism or Teleological Ethics*.
ii. *Deontological Ethics.*
iii. *Virtue Ethics.*

Meta-ethics deals with investigation of the meaning of ethical terms, including a critical study of how ethical statements can be verified. It is more concerned with the meanings of such ethical terms as *good* or *bad and right or wrong* than with what we think is good or bad and right or wrong. *Moral Intuitionism, Moral Emotivism, Moral Prescriptivism, Moral Nihilism,* and *Ethical Relativism* are the main examples of meta-ethical studies.

Applied Ethics – It's the practical aspect of normative ethics. It attempts to explain, justify, apply moral rules, principles, standards, and positions to specific moral problems, such as capital punishment, euthanasia, abortion, adultery, animal right, and so on. This area of normative ethics is termed *applied* because the ethicist applies or uses general ethical principles in an attempt to resolve specific moral problems.

4.4 Aesthetics (Philosophy of Art)

Aesthetics is the theory of art, beauty and love. It studies about the particular value of our artistic and aesthetic experiences. It deals with beauty, art, enjoyment, sensory-emotional values, perception, and matters of taste and sentiment. Etymologically, the term "aesthetics" is derived from the Greek word *aisthêtikos*, meaning "relating to perception/feeling."

Note: ***Art*** and ***Philosophy of Art*** are different.

- **Art** is usually defined as perception of beauty, beauty of the artworks (music, painting, film, drama, sculpture, theatre, architecture). Art is also called an imitation of reality and a medium for the transmission of feelings. Whereas,
- **Philosophy of Art (Aesthetics)** studies the theories/nature of art (i.e., it studies the sensory-emotional values; how artists imagine, create and perform works of art; how people use, enjoy, and criticize art; and what happens in their minds when they look at artworks.

The following are typical Aesthetic questions:

- *What is art? What does it do?*
- *What is beauty? What is love?*
- *What is the relation between art and beauty? Beauty and morality? Art & morality?*
- *What is the connection between art, beauty, and truth?*
- *Can there be any objective standard by which we may judge the beauty of artistic works, or beauty is subjective?*
- *What is artistic creativity and how does it differ from scientific creativity?*
- *Why works of art are valuable? What makes an artwork an art?*
- *Can artistic works communicate? If so, what do they communicate?*
- *Does art have any moral value, and obligations or constraints? Is there a relationship between art and morality (Can Art makes us better or worse people)?*
- *Are there standards of quality in Art?*

The Value of Art

We value art for it gives us **pleasure**. But, is art the only source of pleasure? Obviously, not. There are other many ways of getting pleasure. What makes the kind of pleasure we get from art so special is **the pleasure that accompanies beauty**. Hence, the value of art resides both in

pleasure and **beauty**, and what is beautiful is always **good**. It implies that art has three dimensions – **emotional, aesthetic and moral aspect**.

Based on the perspective on the nature of art and why we value artworks, there are four philosophical theories of art.

(1) **Representationalism.** It views art as imitation or representation of reality. It's the oldest theory of art whose protagonists are Plato and Aristotle.
(2) **Expressivism.** It views art as emotional expression of the artist, and transmission of the artist's feelings to the audience.
(3) **Formalism.** It views art as a significant form.
(4) **Institutional Theory of Art.** What makes an artwork art is the institution; institutionally-defined artifacts.

4.5 Social/Political Philosophy

It studies about of the value judgments operating in a civil society, be it social or political.

The following questions are some of the major Social/Political Philosophy primarily deals with:

- *What form of government is best?*
- *What economic system is best?*
- *What is justice/injustice?*
- *What makes an action/judgment just/unjust?*
- *What is society?*
- *Does society exist? If it does, how does it come to existence?*
- *How are civil society and government come to exist?*
- *Are we obligated to obey all laws of the State?*
- *What is the purpose of government?*

4.6 Logic

Logic is the study or theory of principles of right reasoning. It deals with formulating the right principles of reasoning; and developing scientific methods of evaluating the validity and soundness of arguments. The following are among the various questions raised by Logic:

- *What is an argument; What does it mean to argue?*
- *What makes an argument valid or invalid*
- *What is a sound argument?*
- *What relation do premise and conclusion have in argument?*

- *How can we formulate and evaluate an argument?*
- *What is a fallacy? What makes an argument fallacious?*

5. Importance of Learning Philosophy

1) *Foundational Knowledge*:- Above, we have said that prior to specialization, different disciplines were sheltered in a single home called Philosophy. When they leave their home, they left their foundational traces at home. And, we name this foundational trace as ***Foundational Knowledge***. Hence, every specialized disciple, such as natural and social sciences, arts and humanities, has foundational knowledge in philosophy.

Specialized Discipline	**Its Foundational Knowledge in Philosophy**
Science (in general)	Philosophy of Science
Technology	Philosophy of Technology
Physics	Philosophy of Physics
Mathematics	Philosophy of Mathematics
Biology	Philosophy of Biology
Medicine	Philosophy of Medicine
Art	Philosophy of Art
Political Science	Political Philosophy
Education	Philosophy of Education
Language & Literature	Philosophy of Language

Students studying in any field of discipline will acquire their own respective foundational knowledge by learning philosophy.

2) ***Intellectual and Behavioral Independence:-*** This is the ability to develop one's own opinion and beliefs. Among the primary goals of philosophy, one is the integration of experiences into a unified, coherent, and systematic world views. Studying philosophy helps us not only to know the alternative world views but also to know how philosophers have ordered the universe for themselves. As a result, we can learn how to develop and integrate our experiences, thoughts, feelings, and actions for ourselves, and thus how to be intellectually and behaviorally independent.

3) ***Reflective Self-Awareness:-*** self-actualization cannot be realized without a clear knowledge of oneself and the world in which one lives. Philosophy helps us to intensify our self-awareness by inviting us to critically examine the essential intellectual grounds of our lives.
4) ***Flexibility, Tolerance, and Open-Mindedness:-*** by studying different philosophical perspectives we can understand the evolutionary nature of intellectual achievement and the ongoing development of human thought. As we confront with the thoughts of various philosophers we can easily realize that no viewpoint is necessarily true or false- that the value of any attitude is contextual. Finally, we become more tolerant, open-minded, more receptive, and more sympathetic to views that contend or clash with ours.
5) ***Creative and Critical Thinking****:* - this is the ability to develop original philosophical perspective on issues, problems, and events; and to engage them on a deeper level. From the study of philosophy, we can learn how to refine our powers of analysis, our abilities to think critically, to reason, to evaluate, to theorize, and to justify.
6) ***Conceptualized and well-thought-out value systems in morality, art, politics, and the like****:* - since philosophy directly deals with morality, art, politics, and other related value theories, studying philosophy provides us with an opportunity to formulate feasible evaluations of value; and thereby to find meaning in our lives.

CHAPTER TWO: BASIC CONCEPTS OF LOGIC

2.1 What is Logic?

- **The Etymological Definition of Logic**: The term "logic" came from the Greek word "*logos"*, which is sometimes translated as "sentence", "discourse", "reason", "rule", or "ratio". Of course, these translations are not enough to help us understand the more specialized meaning of "logic" as it is used today.

So what is logic?

- **The Convectional Definition of Logic: Logic** may be defined as the study of **methods** for evaluating arguments. It can also be defined as "the study and formulation of the principles of right reasoning". The aim of logic is thus to develop the system of methods and principles that may use as criteria for evaluating the arguments of others and as a guide to construct arguments of our own.

2.2 The Benefits of Studying Logic

We use logic in our day-to-day communications. As human beings, we all think, reason and argue; and we all are subject to the reasoning of other people. In this day-to-day communication, our arguments must be logical and acceptable; and the tool to do so is **logic**. In general, the following are some of the major benefits that we can gain from the study of logic:

- It helps us to develop the skill needed to construct sound (good) and fallacy-free arguments of one's own and to evaluate the arguments of others;
- It provides a fundamental defense against the prejudiced and uncivilized attitudes that threaten the foundation of a civilized and democratic society;
- It helps us to distinguish good arguments from bad arguments;
- It helps us to understand and identify the common logical errors in reasoning;
- It helps us to understand and identify the common confusions that often happen due to misuse of language;
- It enables us to disclose ill-conceived policies in the political sphere, to be careful of disguises, and to distinguish the rational from irrational and the sane from the insane and so on.

2.3 Important Terminologies in Studying Logic

In studying logic, one has to be acquainted with the following terminologies.

- Sentence
- Statement
- Truth Value
- Premise or Proposition
- Conclusion
- Argument
- Inference

1. **Sentence**. It's a group of words having meaning.

There are four types of sentences. These are;

- ***Declarative*** sentences are used for assertions or claims. Claims or assertions are usually stated by the word "is, are, was, were". In short, ***Declarative*** sentences are sentences which are either true or false. e.g. "He is a clever student."
- ***Interrogative*** sentences are used to ask questions, e.g. "Is he here?"
- ***Imperative*** sentences are used for making requests or issuing commands, e.g. "Come here!"
- ***Exclamatory*** sentences are used for the expression of emotional feelings. e.g. "Oh My God!"

NB. Of the above four types of sentences, only Declarative Sentences have truth value. Hence, we use only Declarative Sentences in Logic (specifically in constructing Arguments). And, all statements are sentences, but not all sentences are statements.

2. **Statement (Proposition)**. It's a declarative sentence which is either true or false.
   Eg_1. He is 20. ……..Eg_2. 2+4=7
3. **Truth Value** (TV). It is the Truth and Falsity of a statement. The TV of 2+4=7 is **False**.
4. **Premises**. They are statements that provide evidence (information) in the argument. Evidence (information) always resides in the premise, not in the conclusion.
5. **Conclusion**. It's the statement that is claimed to follow from the premises. What the premises imply is the conclusion.
6. **Argument**. A group of statements composed of premises and conclusion.

Argument (A) = Premises (P) + Conclusion (C)	
Eg. Man is by nature mortal. (P_1) Socrates is a man. (P_2) Therefore, Socrates is mortal. (C)	An argument may contain more than one premise but only one conclusion.

7. **Inference**. The whole reasoning process that passes from the premises to the conclusion is called Inference.

2.4 Good and Bad Arguments

- If the premises really support the conclusion, it's called **Good** (well-supported) **Argument.** Good Arguments are inferentially correct.
- If the premises don't support the conclusion, it's called **Bad** (poorly-supported) **Argument.** Bad Arguments are inferentially incorrect.

The above example in the table is a good argument.

2.5 Differentiating the Conclusion from the Premise & vice versa, by using indicator words

❖ **Conclusion Indicator Words**

Therefore	*We may conclude*	*Thus*	*As a reult*
Accordingly	*It entails that*	*Consequently*	*So*
Provided that	*Hence*	*We may infer*	*It follows that*
It must be that	*It shows that*	*It implies that*	

❖ **Premise Indicator Words**

Since	Seeing that	In that	
As indicated by	Given that	It may be inferred from	
Because	As	Inasmuch as	
Owing to	For		

Note

1. An argument may contain more than one premise but only one conclusion.
2. There is no rule on the sequence of premise and conclusion in an argument. Premises may come first, then conclusion, or vice versa.
3. The containing of premise/conclusion indicator words in arguments is not mandatory. An argument may or may not contain premise/conclusion indicator words.

   Eg.$_1$, *The space program deserves increased expenditures in the years ahead. Not only does the national defense depend on it, but the program will more than pay for itself in terms of technological spin-offs. Furthermore, a current funding levels the program cannot fulfill its anticipated potential.*

   Eg.$_2$, *Our country should increase the quality and quantity of its military force. Ethnic conflicts are recently intensified; boarder conflicts are escalating; international terrorist activities are increasing.*

What are P_1, P_2, P_3 and the Conclusion in the above two examples?

2.6 Techniques of Recognizing Arguments within a Passage

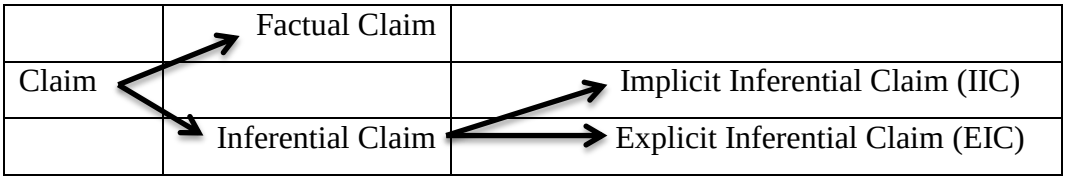
Not all passages contain arguments. Because logic deals with arguments, it is important to be able to distinguish passages that contain arguments from those that do not. In general, ***a passage contains an argument if it purports to prove something***; if it does not do so, it doesn't contain an argument.

Two conditions (especially, the 2nd one) must be fulfilled for a passage to purport to prove something:

1. Factual Claim, and
2. Inferential Claim

- **Factual Claim** is a statement having (true or false) evidence.
- **Inferential Claim** is an implied claim from the factual claim; or, the existence of inferential relationship between the statements in a passage.

And, Inferential Claim can be divided into **Explicit Inferential Claim** (a claim with P&/orC indicator words) and **Implicit Inferential Claim** (a claim without P&/orC indicator words).



An argument, such as below, may be factually correct, but not its inferential claim.

P_1: Every man is mortal. P_2: Socrates is mortal. C: Therefore, Socrates is a man.	P_1 and P_2 are "True" Factual Claims. But, the Inferential Claim that passes from $P_{1\&2}$ to C is not correct.

The mere occurrence of an indicator word by no means guarantees the presence of an argument.

2.7 Passages Lacking an Inferential Claim or Non Inferential Passages

The followings are passages lacking Inferential Claim (i.e., they are non-inferential passages).

Type of Non-Inferential Passage	Description	Example
1. Warnings	There is no evidence to prove this warning to take as true, thus it's not argument.	Watch out don't slide on the ice!
2. A piece of advice	I suggest….; I advise….; It's better….to…; …rather to….	<u>You should keep a few things in mind</u> before buying a used car. Test the oil crank case, the speed indicator.

3. A statement of belief or opinion	I believe…; I think….; I perceive…; I prefer …to…;	I think that going through life with a negative attitude is a waste of time. I would prefer to talk at things with a fresher perspective.
4. Loosely associated statements	Because there is no claim that any of the statements provides evidence for believing another. So it's not an argument.	Water is wet. Swimming pools are filled with water. Many colleges have water sports. Water is thus fun to play.
Report A **report** is a set of statements intended to provide information about a situation, topic, or event.	It's rich in evidence/information, but the reporter makes no claim (fail to draw conclusion) from the information he is providing.	A powerful car bomb blew up in Radisson Hotel, injuring 25 people, causing millions of dollars property damage.
5. Expository Passage		
6. Illustration	An **illustration** is a statement together with an explanatory or clarifying example.	
7. Conditional Statements (CS) CS may be used as P or C or both of an Arg. CS may also be re-expressed to form an argument.	"If……then……." Statement. It's not argument, b/c neither the *antecedent* nor the *consequent* has a truth value. No separate claim b/n *antecedent* & *consequent*; thus, the *consequent* cannot be inferred/implied from the *antecedent*.	**If** Obama was born citizen of Ethiopia, **then** he cannot be elected as president of USA. By removing the words "if" and "then", we can re-write this example to make an argument: Obama was born citizen of Ethiopia. Thus, he cannot be elected as president of USA.
8. Explanation It provides a reason for the occurrence of some phenomenon.	It answers: "why or how it happens" But, Argument answers the question: "How do you know?"	Eg.1: The plane crashed into the forest, b/c birds had flown into the engine. (E) Eg.2: The plane crashed into the forest, b/c its fragmented body parts are found.

Sufficient and Necessary Condition (SC and NC)

Conditional statements are especially important in logic because they express the relationship between the ***necessary*** and ***sufficient*** conditions.

- **A** is SC for **B** whenever the occurrence of **A** is all that is needed for the occurrence of **B**.
- **B** is said to be a NC for **A**, whenever **A** cannot occur without the occurrence of **B**.

Consider it with "Set" and "Sub Set". Sub Set is a SC for a Set, but a Set is NC for the Sub Set. So, in order to identify the NC from the SC, 1st determine which one is the "Set" and which one is the "Sub Set." For example, between Human and Mammal, human is a sub set and mammal is a set. Thus, we can say that: Being a human is SC for being a mammal. But being a mammal is NC before you can be a human.

2.8 Types of Arguments: Deduction and Induction

Based on the strength of the connection between the premise and the conclusion, we have two types of arguments: Deductive Argument and Inductive Argument

Deductive Argument

Strict certainty or Necessity Premises ⟶ Conclusion True……. ……. True False ……..……. ……. False • It proceeds from ***general*** premises to ***specific*** conclusion.	The conclusion doesn't contain new information; i.e., the conclusion is already implied in the premises. Given true premises, it's ***impossible*** for the conclusion to be false; i.e., the conclusion follows with strict necessity from the premises. The TV is assumption

Example-1:

All philosophers are critical thinkers.
Socrates is a philosopher.
Therefore, Socrates is a critical thinker.

Example-2:

All African footballers are blacks.
Messi is an African footballer.
It follows that, Messi is black.

Inductive Argument

Probable/Likely (P/L) Premises ⟶ Conclusion P…….C True…P/L…. True False …P/L…. False • It proceeds from ***specific*** premises to ***general*** conclusion.	The premise doesn't entail the conclusion. The conclusion contains new information. Given true premises, it's ***probable/likely*** for the conclusion to be true (or, it is ***improbable*** for the conclusion to be false). And, this probability is usually expressed by the word "most". In everyday life and science, we use inductive argument.

Example-1:

***Most** African leaders are blacks.*
Mandela was an African leader.
Therefore, probably Mandela was black.

Example-2:

***Almost all** women are mammals.*
Hanan is a woman.
Hence, Hanan is a mammal.

Deductive Argument Indicator words	All, Certainly, necessarily, absolutely, definitely.
Inductive Argument Indicator words	Many, most, majority, some, probable/improbable, plausible/implausible, likely/unlikely and reasonable to conclude

2.9 The Problem of Induction (David Hume 1711 – 1776)

It's the philosophical question of whether inductive reasoning leads to knowledge, for it focuses on the alleged lack of justification for:

Hasty Generalization about the properties of a class of objects based on few instances of observation. Eg., "All swans we have seen are white. Therefore, all swans are white," before the discovery of black swans. Or,

Post-hoc Fallacy. Presupposing that a sequence of events in the future will occur as it always has in the past (the assumption of "The Uniformity of Nature")

2.10 Forms of Deductive and Inductive Argument

A. Forms of Deductive Argument	**Description and Example**
1. Argument based on mathematics	The conclusion depends on some purely arithmetic or geometric computation, not statistics. Eg., *This year MU received 12,000 students. For each of the three campuses, 3,000 students are assigned. It implies that Arid Campus received 4,000 students.*
2. Argument from Definitions	The conclusion depends on the definition of some word used in the premise. Eg., *God is omniscient. It follows that God is all-knowing.* Omniscient=all-knowing
3. Syllogism	Syllogism is an argument with 2P and 1C.
3.1 Categorical Syllogism	Each statement begins with the word "All, No, Some" Eg., ***All*** *lawyers are politicians.* ***Some*** *lawyers are economists. Therefore,* ***some*** *politicians are economists.*
3.2 Hypothetical Syllogism	**"If ……, then ….."** syllogism. Syllogism with conditional statements in one or both of its premises. Eg., *If you study hard, then you will graduate with Distinction. If you graduate with Distinction, then you will get a rewarding job. Therefore, if you study hard, then you will get a rewarding job.*
3.3 Disjunctive Syllogism	Syllogism whose 1st premise is "either…or…" (Disjunctive) statement. Eg., *Rewina is either Ethiopian or Eritrean. Rewina is not Eritrean. Therefore, Rewina is Ethiopian.*

B. Forms of an Inductive Argument (6)

1. ***An argument based on prediction***; in this type argument the premises deal with some known event in the present or past, and the conclusion moves beyond this event to some event in the relative future.

- E.g. For the last consecutive three years Manchester United has won the European Champions League. From this it is reasonable to argue that the champion of this year Champions League will be Manchester United.

2. ***An argument from analogy****;* this argument occurs when there is an analogy or similarity between two things or states of affairs. And, the conclusion is based on this analogy.

- E.g. Both Plato and Aristotle are classical Greece philosophers. Plato accuses poets for their imitative character. Analogously, Aristotle blames poets for their imitative disposition.

3. ***An Inductive Generalization****;* this is an argument that proceeds from the knowledge of a selected ***sample*** to some claim about the whole group. Since the members of the ***sample*** have a certain attributes or characteristic(s), it is argued that ***all*** the members of the group have that same characteristic(s).

- E.g. Your sample shows that more than 60% of the class are highly interested in learning Ethiopian traditional painting. Therefore, we may conclude that all students of the class are very much interested in learning Ethiopian traditional painting.

4. ***An argument from Authority***; this is an argument in which the conclusion rests upon a statement made by some presumed authority or witness.

- E.g. Mr. Thomas Michael, the director of World Food Program in Ethiopia mentioned that almost three million people of the country are suffering because of food scarcity. On the basis of Mr. Thomas Michael's authority, it is reasonable to conclude that millions of Ethiopians are starved.

5. ***An argument based on Signs***; this is an argument that proceeds from the knowledge of a certain sign (symbol, symptom) to knowledge of the thing or situation that the sign stands for.

- E.g. Look her shoulders, there is a tattoo of Emperor H/Sellase. Therefore, she is probably a Rastafarian.

6. ***A Causal Inference***; this is an argument that proceeds from knowledge of a ***cause*** to knowledge of the ***effect***, or, conversely, from knowledge of an ***effect*** to knowledge of a cause.

E.g. Ato Wondemu was an alcoholic person throughout his life. The medical test shows that he is infected with a liver cancer. Thus, he is infected by a liver cancer because he drunk for a number of years.

2.11 Evaluating Deductive and Inductive Arguments

- There are two kinds of evaluating deductive and inductive arguments: by focusing on the **Inferential Claim** only and by focusing on the **Factual Claim** (truth value) of each premise and the **Inferential Claim** of the argument.

Type of Argument	The Evaluation focuses on	The Result of the Evaluation
Deductive Argument	Inferential claim only	Valid or Invalid
	Factual claim & Inferential claim	Sound or Unsound
Inductive Argument	Inferential claim only	Strong or Weak
	Factual claim & Inferential claim	Cogent or Uncogent

Evaluating/Testing Deductive Arguments: Valid/Invalid and Sound/Unsound

- **A Valid Argument** is a deductive argument in which, if the premises are assumed true, it is impossible for the conclusion to be false. In such arguments, the conclusion follows with strict necessity from the premises. For example;

All birds are mammals. A crocodile is a bird. Therefore, the crocodile is a mammal.	NB	1. Validity ≠ Truth Value (Factual Claim)
		2. In validity test, all Ps are assumed True.
		3. Validity is all about Forms (arrangement of terms)
		4. In valid DA, the C should be contained in the P.

- **An Invalid Argument** is a deductive argument such that if the premises are assumed true, it is possible for the conclusion to be false. In these arguments the conclusion does not follow with strict necessity from the premises, even though it claimed to.

Summary on the Valid/Invalid Form of Syllogistic Deductive Arguments

Type of Syllogism	Valid Form			Invalid Form		
Categorical Syllogism	All A are B C is A ∴ C is B	All A are B Some A are C ∴ Some B are C		All A are B C is B ∴ C is A	All A are B Some B are C ∴ Some A are C	
Hypothetical Syllogism Substitute the letters with words A – raining B – wet	If A then B A (A is NC) ∴ B	If A then B If B then C ∴ If A then C	If A then B Not B ∴ Not A	If A then B B (B is SC) ∴ A	If A then B If C then B ∴ If A then C If A then B If A then C ∴ If B then C	If A then B Not A ∴ Not B
Disjunctive Syllogism	Either A or B A ∴ Not B	Either A or B B ∴ Not A	Either A or B Not A ∴ B	Either A or B A ∴ B	Either A or B B ∴ A	Either A or B Not A ∴ Not B

Sound/Unsound Deductive Argument

- **A Sound Argument** is a deductive argument that is valid and has all true premises. Both conditions must be met for an argument to be sound, and if either is missing the argument is unsound. For example

All trees are plants. Acacia is a tree. Therefore, acacia is a plant.	Deductive Arg.	Valid → Sound Unsound Invalid ➡ (all Invalid DA are Unsound)
Every sound arg. has true C	**Sound = Valid Arg. + All True Premises**	

- **Unsound Argument** is a deductive argument that is invalid, has one or more false premises, or both. Every sound argument, by definition, will have true conclusion. A sound argument therefore, is what is meant by a "good" deductive argument in the fullest sense of the term.
- The relationship between the validity of a deductive argument and the truth and falsity of its premises and conclusions can be summarized as follows:

Premises	***Conclusion***	***Validity***	***True/False Questions***
True	*True*	*Valid/invalid*	A valid/invalid arg. may have true P & true C. **True**
True	*False*	*Invalid*	Valid arg. may have true P and false C. **False**
False	*True*	*Valid/invalid*	Valid/invalid arg. may have false P and true C. **True**
False	*False*	*Valid/invalid*	Valid/invalid arg. may have false P and false C. **True**

- A valid deductive argument may have false premise and true conclusion. **True**

Eg:	All cats are human. (False) Biniam is a cat. (False) Therefore, Biniam is a human. (True)	

Evaluating/Testing Inductive Argument: Strong/Weak and Cogent/Uncogent

- **A Strong Argument** is an inductive argument such that if the premises are assumed true, then based on the assumption it is probable that the conclusion is true.
- **A weak Argument** is an inductive argument in which the conclusion doesn't follow probably from the premises (i.e., given all true premises, it's not probable for the conclusion to be true).

→ Unlike validity and invalidity, strength and weakness depends on degrees, this is because inductive argument involves probabilistic reasoning. The central question in determining strength or weakness is whether the conclusion would probably be true if the premises are assumed true. The following examples demonstrate that the first argument is not absolutely weak nor the second absolutely strong. Both arguments would be strengthened or weakened by the random selection of a larger or smaller sample. The incorporation of additional premises into an inductive argument will also generally tend to strengthen or weaken it.

E.g. 1)	This mini-library contains over **10,000** books. **50** books selected at random were found to be written on philosophy. Thus, it is likely that all of the books in the mini-library are books written on philosophy. (**Weak Inductive Argument**)

E.g. 2)	This mini-library contains over **10,000** books. **1000** books selected at random were found to be written on philosophy. Thus, it is likely that all of the books in the mini-library are books written on philosophy. (**Strong Inductive Argument**)

As with validity and invalidity, strength and weakness are only indirectly related to truth and falsity except in the case of true premises and a probably false conclusion. ***Any inductive argument having true premises and a probable false conclusion is always weak.*** Inductive logic would be useless if it accepted as strong any inductive argument having true premises and a probably false conclusion.

A cogent Argument is an inductive argument that is ***strong*** and has ***all true premises***; if either condition is missing the argument is **"uncogent"**. Thus, an uncogent argument is an inductive argument that is weak, has one or more false premises, or both. A cogent argument is the inductive analogue of a sound deductive argument and is what is meant by a "good' inductive argument without qualification. Because the conclusion of a cogent argument is genuinely supported by true premises, it follows that the conclusion of every cogent argument is probably true.

- There is a difference between sound and cogent arguments in regard to the true-premises requirement. In a sound argument it is only necessary that the premises be true and nothing more. Given such premises and a good reasoning, a true conclusion is guaranteed. In a cogent argument, on the other hand, the premises must not only be true, they must also not ignore some important piece of evidence that outweighs the given evidence and entails a quite different conclusion.

E.g. 1)	The famous economist Sir Isaac Newton stated that World Bank's structural adjustment program cannot be effectively implemented in the Third-World nations due to governmental mismanagement. In views of Newton, we may conclude that World Banks structural adjustment program is ineffective. (**Uncogent**)
E.g. 2)	Some South African leaders were imprisoned before they become president. Nelson Mandela was a South African leader. Thus, before his leadership carrier of South Africa Mandela was imprisoned. (**Cogent**)

P1: False P2: False C: False (Strong but Uncogent)	Inductive Arg.	Strong → Cogent Uncogent Weak ➡ (all Weak IA are Uncogent)
Every cogent arg. has true C	**Cogent = Strong Arg. + All True Premises**	

- The relationship between the strength of an inductive argument and the truth and falsity of its premises and conclusions summarized as follows.

Premise	Conclusion	Strength	T/F Question
True	*True*	*Strong/Weak*	A weak/strong argument may have true P & true C. **True**
True	*False*	*Weak*	A strong argument may have true P & false C. **False**
False	*True*	*Strong/Weak*	A weak/strong argument may have false P & true C. **True**
False	*False*	*Strong/Weak*	A weak/strong argument may have false P & false C. **True**

Summary – 1: of Testing Deductive and Inductive Arguments

Type of Argument	Testing Result	No. of Conditions	Conditions (NB: The Connector words)
Deductive Argument	Sound	2	1) Valid, ***and***
			2) All True Premises
	Unsound	3	1) Invalid, ***or***
			2) one or more false Premise, ***or***
			3) both
Inductive Argument	Cogent	2	1) Strong, ***and***
			2) All True Premises
	Uncogent	3	1) Weak, ***or***
			2) one or more false Premise, ***or***
			3) both

Summary – 2

- All invalid arguments are unsound. **True**
- All valid arguments are sound. **False**
- All sound arguments have true premises. **True**
- All sound arguments have true conclusion. **True**
- All strong arguments are cogent. **False**
- All cogent arguments have true premise/conclusion. **True**
- All weak arguments are uncogent. **True**

Chapter 3: Logic and Language

3.1 Philosophy of Language – Reading Assignment

3.2 The Cognitive Meaning and Emotive Meaning of a Word

Many errors in logic stem from a careless or imprecise use of language. Hence, logic requires proper use of terms (words) and statements. Therefore, in this chapter we will study about the purposes of language, meaning and definitions of terms and different techniques of definitions of terms. We will see also an overview of philosophy of language.

The two functions of a language:

1) to convey information
2) express or evoke feelings

For example, consider the following two paragraphs of a single passage:

The death penalty, which is legal in thirty-six states, has been carried out most often in Georgia; however, since 1977 Texas holds the record for the greatest number of executions.	**Cognitive Statements**
The death penalty is cruel and inhuman form of punishment in which hapless prisoners are dragged from their cells and summarily slaughtered only to satiate of a vengeful public.	**Emotive Statements**

The first part of the passage is "**Cognitive Statements**", and is intended primarily to ***convey information*** *and* ***has no value claim***; whereas, the second is "**Emotive Statements**" which are intended to persuade us that the death penalty is bad ***by evoking our emotions***. i.e., the appeal is to emotion, not evidence.

- How do we know that the 1st and 2nd part of the passage (above) have cognitive and emotive meaning? It's by using **cognitive and emotive words**.

Cognitive words	36 states, Georgia, since 1977, Texas, record, … etc.
Emotive words	Cruel, inhuman, hapless, dragged, slaughtered, bloodlust, vengeful…etc

Terminology that conveys information is said to have Cognitive Meaning, and terminology that express or evoke feelings is said to have Emotive Meaning.

The difference between cognitive meaning and emotive meaning is the difference between **fact** and **feeling**.

The above emotive terminologies have also their own cognitive meanings in the dictionary;

- Cruel – means tending to hurt others.
- Inhuman – means inappropriate for others.

- Hapless – means unfortunate.

Emotive words having cognitive meaning implies two things:

1. Emotively charged statements (words) usually have both cognitive and emotive meaning. Such statements are called ***Emotively Charged Statement (ECS)***. But since logic is concerned chiefly with cognitive meaning, it is important that we be able to distinguish and disengage the cognitive meaning of such statements from the emotive meaning.
2. Part of the cognitive meaning of emotively charged statements is a ***value claim***. Such value claims are often the most important part of the cognitive meaning of emotive statements.

- Value claim (VC) is the claim that something is good or bad, right or wrong, moral or immoral.
- Value is the intended conclusion of emotively charged statement.
- VC is always associated with emotively charged statements. i.e., **there is no Value Claim in pure cognitive statements.**

For example, the passage about the death penalty (above) asserts the value claim that the death penalty is wrong or immoral.

NB:- Value Claims are the most important part of the cognitive meaning of emotive statements. VC is used as conclusion and requires evidence to support it. But, when VC are couched with emotive terminologies, the emotive clothing tends to obscure the fact of the VC. As a result, readers and listeners are inclined to swallow the VC as a whole without any evidence.

Terminologies →	Convey information (=cognitive statement) – No Value Claim				
	Evoke emotion (=emotive statement) →	Cognitive Meaning →	Value Claim free of emotive words →	Requires evidence to support	
		Emotive Meaning →	VC with Emotive words →	Obscure Facts →	Create psychological momentum to swallow VC without evidence
CM → Pure CM	**CM** – Cognitive Meaning				
CM → CM of ECS (has VC)	**ECS** – emotively charged statement				

Value Claim →	by evidence (this is the concern of logic)	Logic deals with emotively charged statements (ECS), because they contain Value Claims.
	by emotive terminology	

There are two steps to avoid the effects of emotive terminology:

1. Disengage the cognitive meaning of emotively charged statement from its emotive meaning.
2. Re-express the Value Claim as distinct premises.

Example:-

Abortion is disgusting! I heard that when they do it they have to snip the helpless little baby into pieces. How horrific! It takes a sick, sick human being to think that abortion is ok. Or, an idiot!

- Cognitive meaning – *abortion is an act of interrupting the life of a fetus.*
- Value Claim – *abortion is wrong or immoral.*

Here, the cognitive meaning is "abortion is an act of interrupting the life of a fetus." However, it's an emotively charged passage, and it compels the readers to believe the value claim that abortion is wrong. By disengaging the cognitive meaning, we can re-express the value claim of it as distinct premises:

Abortion is morally wrong. It would clearly be wrong to end the life of a new born baby, because the baby has the potential to be a wonderful human being. But, unborn fetuses also have the potential to be wonderful human beings. So, it's wrong to end an infant's life, it's also wrong to end a fetus's life.

There is no Value Claim difference between the above two passages. The difference is the way of persuasion of their value claim.

3.3 Two Defects of a Cognitive Meaning: Vagueness and Ambiguity

1. Vague Expression

A word is vague when it lacks clarity and certainty what it implies. It's the characteristic of a word whose meaning is not determined with precision. Or, a word is **vague** if there are borderline cases such that it is impossible to tell whether the word applies to them or not.
Vague words – rich, poor, fresh, excessive, conservative, warm, cold, love, peace, etc…

Vagueness affects intensional meaning.

- **Eg.$_1$:-** A law has passed that makes ***poor*** citizens privileged for free education. Here, the word "poor" is vague. It's not clear that who is poor? And, who is not.
- **Eg.$_2$:-** Today, the temperature is ***warm***. Here, there is no borderline between "warm" and "not warm."

NB:- The Vagueness of a word can be avoided by using a definition type called **"Précising Definition"**

- With Vague word, it's impossible to establish the truth and falsity of a statement.

2. Ambiguous Expression

A word is ambiguous when it has more than one meaning in a given context. • Ambiguous expression may give rise to a verbal dispute.
Ambiguous words – ring, match, light, bank, right, race, patient, etc.

Example:-

• I like the ***match*** very much.	The word "match" is ambiguous for it can have more than one meaning. It can apply for inflammable object or the game.
• I will give you a ***ring*** tomorrow.	Here, the word "ring" could signify either the promise of a gift or intention to telephone.

NB:- The Ambiguity of a word can be avoided by using a definition type called **"Lexical Definition"**

The difference between ambiguity and vagueness is that vague terminology allows for a relatively ***continuous range of interpretations*** (the word "warm", for example, can refer to 30^0C, 40^0C, 45^0C, 50^0C,…), whereas ambiguous terminology allows for ***multiple (two) interpretations***.

- The vagueness and ambiguity of a word can be minimized by providing a specific definition to the word in question.
- The vagueness and ambiguity of a word may lead to a **Verbal Dispute**.

3.4 Verbal Dispute and Factual Dispute

Defects on the cognitive meaning of a word not only lead to Vagueness and Ambiguity, but also to disputes. Disputes can center on a confusion of cognitive meanings between the disputants (D_1 and D_2). There are two kinds of disputes – **Verbal Dispute** and **Factual Dispute**. Of the two, Verbal Dispute is usually arisen by the Vagueness and Ambiguity of a word.

Verbal Dispute	Factual Dispute
• Disputes that center on the meaning of a word are called **verbal disputes**. • There is a common word having different meaning used by the two disputants. • Words (such as – ***light***, ***match***, ***ring***, etc) having two meanings may cause a verbal dispute.	• Disputes that center on a matter of fact are called **factual disputes**. • The disputants agree on the meaning of the word. • There is no common word used by the two disputants, D_1 and D_2.

Example$_1$:-

Qalkidan:-	I have been reading some of his books, Paulos Gnogno himself was an astonishing educated man. It's amazing how he thought himself though he attended not so much formal education.
Bethy:-	You are stupid! Paulos Gnogno never came to finish Grade 4. Thus, he was not an educated man.
Common word	**educated man** (ambiguous word). Qalkiqan and Bethy define it differently.
Type of Dispute	**Verbal**

Here, the common word, which is the source of verbal dispute, is "educated man." Qalkidan and Bethy didn't agree on the meaning of the word ***"educated man."***

Example$_2$:-

Tewolde	*I know that Fisseha stole a computer from the old school house. Aberash told me that she saw Fisseha do it.*
Biniam	*That's ridiculous! Fisseha has never stolen anything in his life. Aberash hates Fisseha, and she is trying to pin the theft on him only to shield her criminal boyfriend.*
Common word	No common word
Type of Dispute	**Factual**

3.5 The Intension and Extension of Terms

Arguments are composed of statements; and, statements are made up of words, the basic units of any ordinary language. And, words have meanings, and meanings are conveyed through definitions. In this topic and the next, our concerns are two – words and definitions. Of the words we are interested in the "Terms."

A **term** is a noun word that may serve as the subject of a statement. Terms consist of proper names, common names, and descriptive phrases.

Words that are **Terms**	Napoleon (Proper name), school (common name), …
Words that are **not** Terms	Verbs, adjectives, adverbs, prepositions, conjunctions, quantifiers…

Example:-

All humans are mortal.	Terms – Humans & Mortal	Quantifier – All	Verb – are

The Cognitive Meaning of Terms	Intensional Meaning – refers to quality/characteristics of a term
	Extensional Meaning – refers to quantity/members of a term

- **Intensional meaning** (also called Intension or Connotation) consists of the qualities or attributes or properties that the term connotes.
- **Extensional meaning** (also called Extension or Denotation) consists of the members of the class that the term denotes.

Example$_1$:- Human (a term)

The Intensional meaning of "Human"	Having consciousness, speeches, upright walking, …
The Extensional Meaning of "Human"	All men and women in the world.

Example$_2$:- Inventor (a term)

The Intensional meaning of "Inventor"	Creative, imaginative, intuitive, …
The Extensional Meaning of "Inventor"	Thomas Edison, Graham Bell, the Wright Brothers, …

NB:- These two kinds of meanings will provide the basis for the definitional techniques.

3.6 Convectional Connotation and Empty Extension

- Convectional Connotation – to avoid individual difference on the intensional meaning of a term (b/n cat lovers & cat haters, for eg.,), logicians typically restrict the meaning of connotation to what is usually called the ***conventional connotation***. Hence, the intensional meaning of a term is founded on its Convectional Connotation.
- Empty Extension – the term has no members. Eg., Dinosaurs, the King of Axum, …They were all once existing beings, however, they have long since perished from our present.
- Q – Can we say that God is a term with empty extension?

NB:-

1. Intension determines extension. i.e., attributes determines the size (member) of the class. The intensional meaning of a term serves as the criterion for deciding what the extension consists of. Eg., **Poor** (a person with low daily income). The number of poor will vary according to the properties of Poor (daily income <50 Birr or <100 Birr…)
2. The connotation of a term remains more or less the same from person to person, place to place, and time to time.
3. The denotation of a term also typically remains the same person to person but may change from time to time. And, sometimes the denotation of a term can change radically with the passage of time.

3.7 Sequence of Terms in Increasing and Decreasing Order

Different terms may be put in the order of:-

- Increasing/decreasing intension,
- Increasing/decreasing extension.

1. **Terms in Increasing Intension**. When each term in the series connotes more attributes than the preceding term; and, if it connotes less attributes, it is decreasing intension.
2. **Terms in Increasing Extension**. When each term in the series denotes a class having more members than the preceding term.

Increasing intension (↑I)	*animal, mammal, feline, tiger*	Feline – all cat like animals
Increasing extension (↑E)	*tiger, feline, mammal, animal*	NB:- **↑I=↓E** **↓I=↑E**
Decreasing intension (↓I)	*tiger, feline, mammal, animal*	
Decreasing extension (↓E)	*animal, mammal, feline, tiger*	

	$Term_1$	**$Term_2$**	**$Term_3$**	**$Term_4$**
	Animal (A)	**Mammal (M)**	**Human (H)**	**Woman**
Properties	- Its own properties	- All prop of A, & - Its own prop	- All prop. of A, - All prop. of M,& - Its own prop.	- All prop. of A, - All prop. of M, - All prop. of H,& - Its own properties
General Term ⟵ **↑I, ↓E** / **↓I, ↑E** ⟶ Particular Term				The order of Intension and Extension are inversely related.

3.8 Definitions and Their Purposes

Definition is a group of words that assigns a meaning to a word.

- Definition is important in reducing the vagueness and ambiguity of a word.
- The most common way of preventing differences in the uses of language is by agreeing on the definition of our terms.

Every definition consists of two parts; the definiendum and the definiens.

- **Definiendum:-** is the word(s) to be defined.
- **Definiens:-** is the word(s) that does the defining.

E.g. "Tiger" means a large, stripped, ferocious feline indigenous to the jungles of India and Asia. Here, the word "tiger" is the definiendum, and everything after the word "means" is the definiens.

3.9 Types of Definitions

Totally, there are five types of definitions.

1) **Stipulative Definition**: assigns a meaning to a word or to new phenomena for the first time. This may involve either coining a new word or giving a new meaning for an old word. It's associated with scientific developments, researches and technological innovations.

E.g. Tigon (to designate offspring of male tiger and female lion), Liger (to designate male lion and female tiger)

The Purpose of a stipulative definition is two:

a) To replace a more complex expression with a simpler one. The need for this type of definition is often occasioned by some new phenomenon.
b) To set up secret codes. For example, "Operation Barbarosa" was the name the Germans gave to the invasion of Russia. "Operation Tsehay Gibeat" the Ethio-Eritrea war 1991E.C

Since a stipulative definition is completely arbitrary assignment of a meaning to a word for the first time, there can be no such a thing as true or false stipulative definition. For the same reason, a stipulative definition cannot provide any new information about the subject matter of the definiendum. One stipulative definition, however, be more or less convenient or more or less appropriate than another.

2) **Lexical Definition**: is used to report the meaning that a word already has in a language. Dictionary definitions are all instances of lexical definitions.

- They are definitions used in everyday life. Moreover, it informs someone else the accepted meaning of a term.

In contrast with a stipulative definition, a lexical definition may be true or false depending on whether it does or does not report the way a word is actually used. Because words are frequently

used in more than one way, lexical definitions have further purpose of eliminating the ambiguity that would otherwise arise if one of these meanings were to be confused with another.

A word is ***ambiguous*** when it can be interpreted as having two or more clearly distinct meanings in a given context.

3) **Précising Definitions:** Précising definitions begins with the lexical definition of a term and it narrows and limits on its use. The purpose of a précising definition is to reduce the vagueness of a word.

Whenever words are taken from ordinary usage (lexical definition) and employed in a highly systematic context, such as science, mathematics, medicine, or law, they must always be clarified by means of a précising definition.

Eg., if there is a proclamation to give direct financial assistance to the poor, a Précising definition would have to be supplied specifying exactly who is poor and who is not. Otherwise, the word "poor" remains vague.

- The Précising definition of the word "poor" can be given in this way:
  "Poor is a person whose daily income is less than 50 Birr."

A précising definition differs from a stipulative definition in that the assignment of meaning in a précising definition is not at all arbitrary. A great deal of care must be taken to ensure that the assignment of meaning in a précising definition is appropriate and legitimate for the context within which the term is to be employed.

4) **Theoretical Definition**: It gives the meaning of a word in terms of the theories of a specific discipline. It's discipline specific. They are common in the sciences and philosophy, and can be difficult to understand because of their strict and often conceptual uses. Many terms in philosophy, such as "substance," 'form," 'cause," "God," and in Physics such as mass, light, force have been given theoretical definitions.

Eg., "Heat", in physics, is defined as the random motion of molecules of a substance.

5) **Persuasive Definition**. It's a definition that attaches emotive meaning or value-laden meaning to a word.

Eg.$_1$ - "Abortion" means the ruthless murdering of innocent human being.
Eg.$_2$, - "Abortion" means a safe and established surgical procedure whereby a woman is relieved of an unwanted burden.

Persuasive definition amounts to a certain synthesis of stipulative, lexical, and theoretical definitions backed by the rhetorical motive to engender a certain attitude. And, it commonly appears in controversial topics such as politics, gender and religion.

- Unlike the other types of definitions, Persuasive definition focuses on the emotive use of a language (emotively charged statements) with the objective to influence the attitudes of the reader/listener.

- Persuasive definitions are evaluated not on their truth or falsehood, but rather on their effectiveness as a persuasive device, for it has value claim.

3.10 Definitional Techniques

The techniques are two kinds – Extensional Techniques and Intensional Techniques. And, these techniques are used to produce the five types of definitions (discussed above).

Extensional (Denotative) Definitional Techniques

An extensional definition is one that assigns a meaning to a certain term by mentioning members of the class that the definiendum denotes. We sometimes define terms by sampling their extension. There are at least three ways of indicating the members of a class: pointing to them, naming them individually, and naming them in groups.

A) **Demonstrative (Ostensive) Definitions** are probably the most primitive form of definition. Demonstrative definition can be either partial or complete.

- **Advantage** – Such definition is good to teach one's language for foreigners.
- **Limitation** – its application is limited only to a situation in which the required object is available for being pointed at. Hence, it's the most primitive/limited technique.
- **Peculiar Feature** – It differs from the other types of extensional definition in that the definiens is constituted at least in part by a gesture- the gesture of pointing. And, the definiendum is the physical object.

B) **Enumerative Definition (Naming them individually)**: assigns a meaning to a term by naming the members of the class the term denotes. And this may be either partial or complete; but it is difficult to enumerate all and which have no names.

e.g. "Planet" means one of the following: Mercury, Venus, Earth, Mars, Saturn, Jupiter, Neptune, Uranus, or Pluto. It's **complete enumeration** since we have nine planets so far.

C) **Definition by subclass (Naming them in Group)**: assigns a meaning to a term by naming subclasses of the class denoted by the term. May also be either partial or complete; but complete definitions by subclass are often difficult.

Example:

- "Fictional work" means either a poem, a play, a novel, or a short story.

	Extensional Meaning of Fictional works	**Extensional Meaning of a Novel**
Fictional works means	Novel →	Fiqir eske Meqabir
	Poem	Oromay
	Short Story	Dertogada
	Play	
	Sub-Group (Definition by Sub Class) or Naming in Group)	**Enumerative Definition (Naming Individually)**

- Extensional definitional techniques are chiefly used as techniques for producing lexical and stipulative definitions. Although it is inconceivable that extensional definitions could also serve as techniques for theoretical and persuasive definitions (though this would be highly unusual), extensional definitions by themselves cannot properly serve as précising definitions for the following reason. The function of a précising definition is to clarify a vague word, and vagueness is a problem affecting intensional meaning. Because the intension is imprecise, the extension is indefinite. This implies that extension is determined by intension. i.e., the intensional meaning of a term serves as the criterion for deciding who the members are.
- The three Extensional definitional techniques imply the cognitive meaning of the term. So, they cannot use the emotive meaning of the term to produce Persuasive Definition.
- The principle intension determines extension, whereas the reverse is not true, underlies the fact that all extensional definitions suffer serious deficiencies. Note that extensions can suggest intensions, but they cannot determine them.

Eg.-1: Herbivorous are animals feeding on plants only, such as cow, horse, sheep… (Lexical definition of "**Herbivorous**" produced by the extensional definitional technique of **Enumeration** or Naming the members individually).

Eg.-2: Animal is a living thing that can move voluntarily, such as carnivorous, herbivorous and omnivorous. (Lexical definition of "**Animal**" produced by the extensional definitional technique of naming the members in group or by **Sub-class**)

Eg.-3: Tigon means that. (stipulative definition of "**Tigon**" produced by the extensional definitional technique of Gestural Pointing or **Demonstrative**)

NB:- We cannot produce the Precising, Theoretical and Persuasive Definitions by using the three types of Extensional definitional techniques.

Intensional (Connotative) Definitions

An intensional definition is one that assigns a meaning to a word by indicating the qualities or attributes that the word connotes. Four strategies may be used to indicate the attributes a word connotes.

A) **A synonymous Definition** is one in which the definiens is a single word that connotes the same attributes as the definiendum; the definiens is the synonym of the word being defined.

Examples:

- "Physician" means doctor. (The Lexical definition of "Physician" produced by the intensional definitional technique of **Synonymous**)
- "Observe" means see
- "Intentional' means willful.

A synonymous definition is a highly concise way of assigning a meaning. However, many words have subtle shades of meaning that are not connoted by any other single word. For example, "wisdom" is not exactly synonymous with either "knowledge," "understanding."

Synonymous definition is used to produce only lexical definitions, because its definien contains no more information than a synonym to the definiendum.

B) **Etymological Definition** assigns a meaning to a word by indicating the word's ancestry or the root word in both its own language and other languages. Most English words have ancestors in Greek, or in Latin, or in French. It has special importance for:

i. It often conveys the word's root/seminal meaning from which all other associated meanings are derived.
ii. If one is familiar with the etymology of one English word, one often has access to the meaning of an entire constellation of related words.

Examples:

1.	The word "**Orthodox**" derives from the two Greek words ***ortho***, meaning right or straight, and ***doxa***, meaning belief or opinion.
2.	The word "**principle**" derives from the Latin word ***principium***, which means beginning or source.
3.	The word "**captain**" derives from the Latin noun ***caput*** which means head.

C) **Operational Definition**: assigns a meaning to a word only after the experimental proof. This definitional technique can produce ***Theoretical definitions***.

- **Deficiency (Limitation)** – Its application is limited only to the experimental sciences.

Examples:

1. A solution is an "acid" if and only if litmus paper turns red when dropped on it. (The ***Theoretical definition*** of "**Solution**" produced by the intentional technique of ***Operational Definition***)
2. A subject has 'brain activity" if and only if an electroencephalograph shows oscillations when attached to the subject's head.
3. One substance is "harder than" another if and only if one scratches the other when the two are rubbed together.

- Each of these definitions prescribes an operation to be performed. Unless it specifies such an operation, a definition can't be an operational definition. For example, "A solution is an "acid" if and only if it has a pH of less than 7," while good in other respects, is not an operational definition because it prescribes no operation.
- Operational definitions were invented for the purpose of tying down relatively abstract concepts to the solid ground of empirical reality.

D) **A Definition by Genus and Difference (G&D)**: assigns a meaning to a term by identifying the Genus, the Species and the Difference.

- **Genus** is a relatively larger class of the term.
- **Species** is relatively smaller class of the term within the Genus. Genus and Species are

thus merely relative classifications.

- **Difference (Differentia)** is the attribute that distinguishes the various species within the Genus.
- Question – if the Species "human", "mammal", "woman" are given, what are their respective Genus?

Species	**Difference**	**Genus**	
Husband means	married	man	Lexical definition of "Husband" produced by G&D
Ice means	frozen	water	Lexical definition of "Ice" produced by G&D

- Definition by genus and difference is the most effective of the intensional definitions, for it can produce the five types of definitions (stipulative, lexical, précising, theoretical, and persuasive). i.e., It is more applicable and achieves more adequate results than any of the other kinds of intensional definitions.

Correlation of Definitional Techniques with types of definitions

This technique		Can produce these types of definitions				
		Stipulative	**Lexical**	**Précising**	**Theoretical**	**Persuasive**
Extensional Definitional Technique	**Demonstrative**	√	√			
	Enumerative	√	√			
	Sub-Class	√	√			
Intensional Definitional Technique	**Synonymous**		√			
	Etymological		√			
	Operational		√		√	
	Genus & Diff.	√	√	√	√	√

3.11 Criteria for Lexical Definitions

Above, we have discussed about five types of definitions. Of these definitions, lexical definition is the most important and common type of definition that we often use in our day-to-day life. In this lesson, we will see the common rules of lexical definitions.

Rule 1: A Lexical Definition Should Conform to the Standards of Proper Grammar.

A definition, like any other form of expression, should be grammatically correct. For examples, the following definitions are grammatically incorrect:

Grammatically Incorrect	**Grammatically Correct**
Vacation is when you don't have to go to work or school.	*'Vacation'' means a period during which activity is suspended from work or school.*
Furious means if you're angry at someone.	*"Furious'' means a condition of being angry.*

Rule 2: A Lexical Definition Should Convey the Essential Meaning of the Word Being Defined.

A definition cannot be helpful if it fails to convey the essential meaning of the definiendum. Any definition that defines the word ''human'' as "featherless biped", for instance, cannot be helpful since it

fails to convey the essential meaning of ‘‘human’’ as the word is used in ordinary English. It says nothing about the important attributes that distinguish humans from the other animals, namely, the capacity to reason and to use language on a sophisticated level. Thus, a more adequate definition would be ‘‘‘human’ means the animal that has the capacity to reason and to speak.”

Rule 3: A Lexical Definition Should be Neither too Broad nor too Narrow.

If a definition is too broad, the definiens includes too much; if it is too narrow, the definiens includes too little. If, for example, ‘‘bird’’ were defined as any warm-blooded animal having wings, the definition would be too broad because it would include bats, and bats are not birds. If, on the other hand, ‘‘bird’’ were defined as any warm-blooded, feathered animal that can fly, the definition would be too narrow because it would exclude ostriches, which cannot fly.

Rule 4: A Lexical Definition Should Avoid Circularity.

Sometimes the problem of circularity appears in connection with pairs of definitions. The following pair is circular:

- *“Science’’ means the activity engaged in by scientists.*
- *“Scientist’’ means anyone who engages in science.*

At other times, a definition may be intrinsically circular. Of the following, the first is a synonymous definition, the second a definition by genus and difference:

- *“Quiet’’ means quietude.* (the Lexical Definition of “Quiet” produced by the intensional technique of Synonymous)
- *“Silence’’ means the state of being silent.* (the Lexical Definition of “Silence” produced by the intensional technique of Genus and Difference)

Rule 5: A Lexical Definition Should Not Be Negative When It Can Be Affirmative.

Of the following two definitions, the first is affirmative, the second negative:

- *“Concord’’ means harmony.*
- *“Concord’’ means the absence of discord.*

Some words, however, are intrinsically negative. For them, a negative definition is quite appropriate. **Examples:**

- *“Bald’’ means lacking hair.*
- *“Darkness’’ means the absence of light.*

Rule 6: A Lexical Definition Should Avoid Figurative, Obscure, Vague, or Ambiguous Language.

- A definition is ***figurative*** if it involves metaphors or tends to paint a picture instead of exposing the essential meaning of a term. Example:
    - *“Camel’’ means a ship of the desert.*

- A definition is ***obscure*** if its meaning is hidden as a result of defective or inappropriate language. One source of obscurity is overly technical language. Compare the following two definitions:
    - *"Bunny'' means a mammalian of the family Leporidae of the order Lagomorpha whose young are born furless and blind.*
    - *"Bunny'' means a rabbit.*

The problem lies not with technical language as such but with needlessly technical language. Because ''bunny'' is very much a nontechnical term, no technical definition is needed. However, some words are intrinsically technical, and for them only a technical definition will be appropriate.

- A definition is **vague** if it lacks precision or if its meaning is blurred- that is, if there is no way of telling exactly what class of things the definiens refers to. Example:
    - *"Democracy'' means a kind of government where the people are in control.*

This definition fails to identify the people who are in control, how they exercise their control, and what they are in control of.

- A definition is **ambiguous** if it lends itself to more than one distinct interpretation. Example (ambiguous statement):

- *"Triangle" means a figure composed of three straight lines in which all the angles are equal to 180.*

Does this mean that each angle separately is equal to 180 or that the angles taken together are equal to 180? Either interpretation is possible given the ambiguous meaning of ''all the angles are equal to 180."

Rule 7: A Lexical Definition Should Avoid Affective Terminology.

Affective terminology is any kind of word usage that plays upon the emotions of the reader or listener. It includes sarcastic and facetious language and any other kind of language that is liable to influence attitudes. Example:

- *"Communism'' means that ''brilliant'' invention of Karl Marx and other foolish political visionaries in which the national wealth is supposed to be held in common by the people.*

Rule 8: A Lexical Definition Should Indicate the Context to Which the Definiens Pertains.

This rule applies to any definition in which the context of the definiens is important to the meaning of the definiendum. Examples:

- *"Strike'' means (in baseball) a pitch at which a batter swings and misses.*
- *''Strike'' means (in bowling) the act of knocking down all the pins with the first ball of a frame.*
- *''Strike'' means (in fishing) a pull on a line made by a fish in taking the bait.*

It is not always necessary to make explicit reference to the context, but at least the phraseology of the definiens should indicate the context.

Chapter Four: Basic Concepts of Critical Thinking

Critical thinking can be defined as a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims. And, most of the time fallacies are committed when the arguer misses one or more principles of good arguments and failed to adhere to the basic standards of critical thinking and intellectual code of conduct.

4.1 Standards of Critical Thinking

To identify a critical thinking from the uncritical, philosophers refer to some standards, such as clarity, precision, accuracy, relevance, consistency, logical correctness, completeness, and fairness.

1) Clarity

Clarity refers to clear understanding of concepts and statements, and clearly expressing them in a language that is ***free of obscurity and vagueness***. When we construct argument, we should take into consideration or pay close attention to clarity.

2) Precision

Precision is a matter of being exact, accurate and careful. Most ideas are **vague and obscures** though we think we have precise understanding of them.

3) Accuracy

Accuracy is about having and getting **true information**. If the ideas and thoughts one processes are not real, then one's decision based on wrong and false information will likely to result in distorting realities.

4) Relevance

The issue of relevance is the issue of restricting oneself only to the idea raised. A favorite debaters' trick is to try to distract an audience's attention by raising an irrelevant issue. Critical thinkers focus and carefully choose only the information that has logical relation with the ideas at hands. Issues raised should have logical connection with the question at hand. Two ideas are relevant when they have logical connection.

5) ***Consistency***

Consistency is about the quality of always behaving in the same way or of having the same position or standards. Inconsistency leads to the loss of credibility. There are two kinds of inconsistency that should be avoided. One is *logical inconsistency,* which is inconsistence in one's thought. The other is *practical inconsistency,* which is inconsistency in one's thought and practice.

6) ***Logical Correctness***

Logical Correctness refers to the logical relationship between our premises and our conclusion. i.e., our conclusion should logically follow from the premises (the beliefs we held).

7) ***Completeness***

8) ***Fairness***

Critical thinking demands that our thinking to be fair - that is, **open minded, impartial, and free of distorting biases, preconceptions, prejudices and stereotypes**.

4.2 Codes of Intellectual Conduct for Effective Discussion

A) Principles of Good Argument

The following five principles are important to construct the strongest possible arguments.

1) ***The Structural Principle***

Structure refers to the relationship between premise and conclusion. ***Sound*** and ***cogent*** arguments are structurally good arguments. i.e., the conclusion should either follows necessarily from its premises, in the case of deductive arguments, or follows probably from its premises, in the case of inductive arguments.

2) ***The Relevance Principle***

It refers to the **truthfulness** of the premise and the conclusion. A good argument must have both true premises and true conclusion.

3) ***The Acceptability Principle***

It refers to the acceptability of the reason of the argument **by a mature, rational person**. A reason is acceptable only when all the relevant evidences are available.

4) ***The Sufficiency Principle***

The Sufficiency Principle **=** the Relevance Principle **+** the Acceptability Principle

Failure to satisfy the principle of sufficiency may lead to fallacies of weak induction.

5) The Rebuttal Principle

It refers to the inclusion of the **strongest** counter argument (criticism) into one's argument, and how the arguer rebutted (refuted) the counter argument. This principle requires that one who presents an argument for or against a position should include in his the argument an effective rebuttal to all anticipated serious criticisms of the argument that may be brought against it or against the position it supports.

B) Principles of Critical Thinking

1) The Fallibility Principle

This principle requires that each participant in a discussion should be willing to accept that his view is fallible. i.e., if your argument is refuted by another argument, you have to be willing to change your idea and accept the winner idea.

2) The Truth Seeking Principle

This principle requires that each participant should be committed to the task of searching for the truth by examining alternative positions.

3) The Clarity Principle

It requires that the formulations of all positions, defenses, and attacks should be free of any kind of linguistic confusions (such as vague, ambiguous, or contradictory language) and clearly separated from other positions and issues. Missing the clarity principle may lead ***to the fallacy of amphiboly and equivocation***.

4) The Burden of Proof Principle

This principle requires that the burden of proof for any position usually **rests on the participant who sets forth the position**. If, and when, an opponent asks, the proponent should provide an argument for that position. To ask others to accept your claim without any evidence, or to shift the burden of proof to them by suggesting that your position is true unless they can prove otherwise, is to commit the fallacy of **"arguing from ignorance,"** for you are, in this way, making a claim based on no evidence at all. The Burden of Proof Principle associates the legal, moral and epistemic responsibility about the implications of one's information to the one who introduces and uses the information to support his/her claim.

5) The Principle of Charity

If a participant's argument is **reformulated by an opponent**, it should be carefully expressed in its strongest possible version that is consistent with what is believed to be the original intention

of the arguer. The arguer must be fair by letting our opponents amend any portion of our reconstruction of their arguments. Missing the principle of charity may lead to commit ***straw man fallacy***.

6) The Suspension of Judgment Principle

This principle requires that if no position is defended by a good argument, one should suspend judgment about the issue. If suitable evidence is so lacking that one has no good basis for making a decision either way, it may be quite appropriate to suspend judgment on the matter and wait until there is more of a basis for decision.

7) The Resolution Principle

This principle requires that an issue should be resolved (or settled) if the argument fulfills all the above six principles. Good arguments resolve issues.

4.3 Characteristics of Critical Thinking

Critical thinkers:

- ✓ Are honest with themselves, acknowledging what they don't know, recognizing their limitations, and being watchful of their own errors.
- ✓ Regard problems and controversial issues as exciting challenges.
- ✓ Strive for understanding, keep curiosity alive, remain patient with complexity, and are ready to invest time to overcome confusion.
- ✓ Base judgments on evidence rather than personal preferences, deferring judgment whenever evidence is insufficient. They revise judgments when new evidence reveals error.
- ✓ Are interested in other people's ideas and so are willing to read and listen attentively, even when they tend to disagree with the other person.
- ✓ Recognize that extreme views (whether conservative or liberal) are seldom correct, so they avoid them, practice fair-mindedness, and seek a balance view.
- ✓ Practice restraint, controlling their feelings rather than being controlled by them, and thinking before acting.

Uncritical thinkers:

- ➢ Pretend they know more than they do, ignore their limitations, and assume their views are error-free.

- Regard problems and controversial issues as nuisances or threats to their ego.
- Are inpatient with complexity and thus would rather remain confused than make the effort to understand.
- Base judgments on first impressions and gut reactions. They are unconcerned about the amount or quality of evidence and cling to their views steadfastly.
- Are preoccupied with themselves and their own opinions, and so are unwilling to pay attention to others' views. At the first sign of disagreement, they tend to think, "How can I refute this?"
- Ignore the need for balance and give preference to views that support their established views.
- Tend to follow their feelings and act impulsively.

4.4 Barriers to Critical Thinking

Some of the most common barriers to critical thinking are:

Lack of relevant background information	egocentrism (self-centered thinking)	socio-centrism (group-centered thinking)
poor reading skills	prejudice	peer pressure
bias	superstition	conformism
provincialism (narrow, unsophisticated thinking)	scapegoating (blaming the innocent)	rationalization (inventing excuses to avoid facing our real motives)
narrow-mindedness	closed-mindedness	distrust in reason
relativistic thinking	stereotyping	unwarranted assumptions

Let us examine in detail five of these impediments that play an especially powerful role in hindering critical thinking: egocentrism, socio-centrism, unwarranted assumptions, relativistic thinking, and wishful thinking.

1) Egocentrism

Egocentrism is the tendency to see reality as centered on oneself. Egocentrics are selfish, self-absorbed people who view their interests, ideas, and values as superior to everyone else's. Egocentrism hinders rational thinking by focusing excessively on the self.

2) Socio-centrism

It is group-centered thinking. Socio-centrism can hinder rational thinking by focusing excessively on the group. Socio-centrism can distort critical thinking in many ways. Two of the most important are: **group bias** and **conformism**.

Group bias is the tendency to see one's own group (nation, tribe, sect, peer group, and the like) as being inherently better than others. It considers "others" as "outsiders." Most people absorb group bias unconsciously, usually from early childhood. It is common, for example, for people to grow up thinking that their society's beliefs, institutions, and values are better than those of other societies. Clearly, this kind of "mine-is-better" thinking lies at the root of a great deal of human conflict, intolerance, and oppression.

Conformism refers to our tendency to follow the crowd - that is, to conform (often unthinkingly) to authority or to group standards of conduct and belief. The desire to belong, to be part of the in-group, can be among the most powerful of human motivations. This desire can seriously cripple our powers of critical reasoning and decision-making.

3) Unwarranted Assumptions and Stereotypes

An assumption is something we take for granted - something we believe to be true without any proof or evidence. **Assumptions can be warranted or unwarranted**. You go to class at the scheduled time because you assume that class is being held at its normal hour and in its same place. You don't call to the professor each day to ask if class is being held; you just assume that it is. Such assumptions are warranted, which means that we have good reason to hold them.

Unwarranted assumptions, however, are unreasonable. An unwarranted assumption is something taken for granted without good reason. One of the most common types of unwarranted assumptions is a **stereotype**. The word stereotype comes from the printing press era, when plates, or stereotypes, were used to produce identical copies of one page. Similarly, when we stereotype, as the word is now used, we assume that individual people have all been stamped from one plate, so all politicians are alike, members of ethnic groups, professors, women, teachers, and so forth are assumed alike.

When we form an opinion of someone that is based not on his or her individual qualities but, rather, on his or her membership in a particular group, we are assuming that all or virtually all members of that group are alike. Because people are not identical, no matter what race or other similarities they share, stereotypical conceptions will often be false or misleading.

Typically, stereotypes are arrived at through a process known as ***hasty generalization***, in which one draws a conclusion about a large class of things (in this case, people) from a small sample.

4) Relativistic Thinking

One of the strongest challenges to critical thinking is relativistic thinking. Relativism is the view that truth is a matter of opinion. There are two popular forms of relativism: *subjectivism* and *cultural relativism*. **Subjectivism** is the view that truth is a matter of individual opinion. According to subjectivism, whatever an individual believes is true, *is* true for that person, and there is no such thing as "objective" or "absolute" truth, i.e., truth that exists independent of what

anyone believes. For example, suppose Abdella believes that abortion is wrong and Obang believes that abortion is not always wrong. According to subjectivism, abortion is always wrong for Abdella and not always wrong for Obang. **Both beliefs are true** – *for* them. And truth for one individual or another is the only kind of truth there is. The moral aspect of subjectivism is called ***moral subjectivism***, the view that morality is subjective to an individual.

The other common form of relativism is **cultural relativism**. This is the view that truth is a matter of social or cultural opinion. Drinking wine, for example, is immoral in Iran but is morally permissible in France. Thus, for the cultural relativists, just as for the subjectivist, there is no objective or absolute standard of truth. Cultural relativism has also moral aspect called ***cultural moral relativism,*** the view that whatever a society or culture believes is morally right and good. Thus, according to cultural moral relativism, if culture A believes that polygamy is wrong, and culture B believes that polygamy is right, then polygamy is wrong for culture A and right for culture B. Cultural relativism support the value of tolerance, for it tells us that we should respect the customs and values of other societies.

The danger of all kinds of relativism for critical thinking, however, is that it stands against ***The Fallibility Principle*** *and* ***The Truth Seeking Principle*** *of Critical Thinking.*

5) Wishful Thinking

Wishful thinking refers to a state of believing something not because you had good evidence for it but simply because you wished it were true.

Chapter 5: Informal Fallacies

Here, in this chapter we will deal with fallacy by combining elements of Chapter Two (i.e., invalid and weak arguments) and Chapter Three (the misuse of words, such as ambiguity and vagueness). However, fallacy is more complicated and broader than these concepts.

5.1 Fallacies in General

Fallacy is a defect (failure) in reasoning **that consists in something other than merely false premises**. And, there are two ways in which an argument can fail or be incorrect:

1. One or more of the premises might be false or questionable. This implies that *Unsound* and *Uncogent* arguments are defective arguments.
2. The premise(s) might fail to establish the conclusion (i.e., error in reasoning or error in the inferential claim). This implies that *Invalid* and *Weak* arguments are defective arguments. And, the error in the inferential claim is called *Fallacy*.

Hence, common mistakes in the inference are called fallacies. This implies that those deductive and inductive arguments having wrong inferences (i.e., *invalid* and *weak* arguments) are fallacious. And, fallacies can be committed in two ways (i.e., we have two types of fallacies):

1. Error in the formal structure of the argument; i.e., improper arrangement of terms called ***Formal Fallacy***. (formal means *of the form*/position of terms and it's only for Deductive Argument).
2. Error in the use and meaning of a word or a language called ***Informal Fallacy***.

The Difference between Formal Fallacy and Informal Fallacy

		Formal Fallacy (Deductive Fallacy)	**Informal Fallacy**
1.	It's an error	in the form, or arrangement of terms or breaking some rules of validity.	It arises from carelessness in clarifying a word or a language; &, it's intentional.
2.	It can be detected by...	Looking at the form or position of terms (i.e., all invalid are formally fallacious).	By examining the contents of the argument, not by its form.
3.	Can be found	Only in deductive argument (i.e., on the invalidity of the three syllogisms)	In both deductive and inductive arguments.
4.	Remark	It doesn't concern the truth & falsity of an argument; i.e, it's a matter of invalid form.	It concerns on the issue of truth & falsity. It's a matter of unclear expression (i.e., Arg. with vague & ambiguous expressions are informal fallacies)
5.	Representation	We can substitute terms with letters to see the structure, b/c we are concerned only with arrangement of terms.	We cannot reduce it to symbolic formulas.

The Difference between Fallacies and other Logical Mistakes (Invalid, Weak, Unsound and Uncogent Arguments)

The similarity b/n the two is that both of them are mistakes committed in arguments. However, the nature of the logical mistake committed on both sides is not similar. Invalid, Weak, Unsound and Uncogent arguments are plain (easy to understand) defects of arguments, and the detection mechanism of them is also simple. However, fallacies are hidden, misleading and deceptive arguments, whose purpose is to deceive the reader or listener. When Invalid, Weak, Unsound and Uncogent arguments hold deceptive characters and become very tricky to detect them, they would acquire the nature of fallacies. And, their deceptions mostly arise from the uses of words or language. Look at the following example:

All factories (F) are plants (P). All plants contain Chlorophyll (C). ∴ All factories contain Chlorophyll	All F are P All P are C ∴ All F are C	• By being ambiguous, the word ***"Plant"*** has become tricky & misleading. • Representing "tricky" terms by letters misleads.
Valid & formally correct, but informal fallacy b/c of the ambiguous word "plant"		

True/False

- A valid argument can be informal fallacy. **True**, the above example is a good one.
- A valid argument can be formally fallacious. **False**, b/c a valid argument is formally correct.

5.2 Types of Informal Fallacies

Though the number of fallacies is many, here we will deal with only 22 types of fallacy grouped into five.

	The Fallacy of Relevance	**The Fallacies of Weak Induction**	**Fallacies of Presumption**	**Fallacies of Ambiguity**	**Fallacies of Grammatical Analogy**
1.	Appeal to Force	Appeal to Unqualified Authority	Begging the Question	Equivocation	Composition
2.	Appeal to Pity	Appeal to Ignorance	Complex Question	Amphiboly	Division
3.	Appeal to People	Hasty Generalization	False Dichotomy		
4.	Against the Person	False Cause	Suppressed Evidence		
5.	Straw man	Slippery Slope			
6.	Red Herring	Weak Analogy			
7.	Accident				
8.	Missing the Point				
	P ⟶ Irrelevant C	*They are very weak inductive arguments*	*The problem is in the assumption.*	*It arises from ambiguous exp.*	*Grammatically, they seem good*

I. Fallacies of Relevance

It's an argument in which the premise is logically ***irrelevant*** to establish the conclusion. Yet, the premises may appear to be psychologically relevant; i.e., the connection between the premise and the conclusion is emotional, not logical.

1. **Appeal to Force/Stick** (*Argumentum ad Baculum*)

It tries to persuade others by using threat of force (physical or psychological intimidation) in the premise. Such threat cannot provide genuine evidence for the conclusion to be true. Hence, the threat is irrelevant to the conclusion (i.e., threat doesn't prove the truth of the argument).

Eg.	(Preacher's message): Accept Jesus Christ as your savior. Ignoring this message makes your soul final destination in hell. (Psychological threat)

2. **Appeal to Pity** (*Argumentum ad Misericordian*)

The arguer attempts to support a conclusion by evoking pity or sympathy. It's the direct opposite of appeal to force. The arguer insists to get a special favor. This type of argument is fallacious, because our emotional responses are not always a good guide to truth.

Eg.	The vacant position in the accounting department should be given to Mr. John. Because Mr. John has six hungry children to feed.

The example above is fallacious because the foundation of modern society and institution is meritocracy – merit based. But, here, the question is:

- Does affirmative action (support given to women and disabled persons) commit *Appeal to Pity* fallacy?

3. **Appeal to People/Majority** (*Argumentum ad Populum*)

The arguer argues that his position is correct, because most people have accepted his argument. And, it creates mob mentality. This fallacy has two approaches:

- **Direct Approach** – appealing directly to the people with the objective to arouse mob mentality, esp., in political propaganda.
- **Indirect Approach** – appealing to the people through famous individuals, such as artists, celebrities.

Eg.	Ladies and Gentlemen, the Republican Party will emerge victorious! We are the true party of the American people! We embody the values that all real Americans hold sacred. (Direct Approach)

The fallacy of appeal to people is usually committed in advertisements and political propaganda. And, it has Three (3) varieties – ***Vanity, Snobbery and Bandwagon***. And, to easily remember these three varieties of *Appeal to People*, it's important to associate them with the *general truth* about the three structures of any nation (people). Any nation (society) has its own celebrities, distinguished persons (authorities, very rich persons, royal families, etc) and the ordinary majority people.

	Part of the Society	**Its associated fallacy**
1.	Celebrity (famous athletes, artists, etc)	Vanity
2.	Distinguished Persons/Product	Snobbery
3.	Others (ordinary majority)	Bandwagon

3.1 Bandwagon Approach

It tries to persuade the person because others are doing/accepting it. And, it usually uses the words "majority", "most people", "many", "everybody" …etc.

Eg.	You should vote this party, because *everybody* is in favor of it.

3.2 Appeal to Vanity

It's committed through a celebrity persons (such as famous Athletes and Artists), especially during advertisements.

Eg.	This dress is the best fashion of the day. Aster Awoke worn it in her New Year's show at Sheraton Hotel. (NB: Aster Awoke is a celebrity in Ethiopian music)

3.3 Appeal to Snobbery

The term Snobbery refers to a person with high social position, such as Royal Families, high governmental statespersons, and wealthy persons. This argument tries to persuade that you are one of the selected few, so buy a product which is consumed by the distinguished few.

Eg.	These shoes are "Nike" brand. You know that "Nike" is not for the ordinary people. So, buy a Nike shoes and join the dignitaries.

- The above three types of fallacies *(appeal to force, pity and people)* are collectively called ***"Emotional Appeal of Relevance."*** Because by arousing the emotion of the audience, the arguer tries to have emotional approval of the claim of the conclusion.

4. Argument against the Person *(Argumentum ad Hominem (Hominem=Human/ person)*

This argument always involves two persons – P_1 and P_2, and P_2 refutes P_1. Here what's refuted, however, is not the argument, but the person himself who provides the argument. Hence, the rebuttal (the rejection of the argument) becomes personalized. And, this rebuttal occurs in three forms – ***Abusive***, ***Circumstantial*** *and* ***Tu quoque***. And, to easily remember these three varieties of *Against the Person Fallacy*, it's important to associate them with the *general truth* about a person. Any person has ***personality***, ***environment*** and ***action***. And, "Environment" refers to family, birth place, citizenship, culture, religion, language, ethnicity, educational background, profession, etc.

	Any Person has:	**Its Associated Fallacy**
1.	Personality	Abusive
2.	Environment	Circumstantial
3.	Action	Tu quoque (You too did/are doing that)

4.1 Ad Hominem Abusive

P_2 responds to the argument of P_1 by verbally abusing the ***personality*** of P_1.

Eg.	Sigmund Freud's psychoanalysis theory is nonsensical and unacceptable. You know Freud is a stupid sexist. (Sexist is a person who undermines women)

4.2 Ad Hominem Circumstantial

This fallacy is not directed on attacking the personality of the opponent person, but on the opponent's circumstance (environment).

Eg.	Dr. Mustefa advocates a policy of increasing financial spending for higher education. But that is not innocent advocacy, for the reason that he is a university professor and would benefit financially from such a policy. (The attack is towards the *position* of Dr. Mustefa)

4.3 Tu quoque (You too did/are doing that)

P_2 rejects the argument of P_1 only because P_1 did it some time ago (or doing it at the present). The nature of this fallacy looks like this:

- "How do you argue that I should stop doing "X", while you yourself are doing (have done) "X".

Eg.	My teacher told me that cheating on exam is a bad habit. But, he himself told me that he used to cheat on exam when he was in university. Thus, his argument is foolish.
	Patient to a Doctor: *Look Doctor, you cannot advise me to quit smoking cigarette because you yourself is a smoker. How do you advise me to quit smoking while you yourself is smoking?*

The arguments (above) are fallacious, because Cheating or Smoking is wrong whether the advisor himself did the actions or not. i.e., the truth of the advice doesn't depend on the action of the advisor.

5. Straw man Fallacy

	Real Man – with original argument
Man →	
	Straw Man – whose argument is distorted

Like *Against the Person*, this fallacy also always involves two persons – P_1 and P_2. And, P_2 distorts the argument of P_1 for the purpose of easily attacking it. P_2 demolishes the distorted argument (not the original argument), and then concludes that the original argument of P_1 has been demolished. Exaggeration and adding new premise are usually used as distorting mechanism. And, it draws a conclusion from the distorted (new) premises.

The original argument of P_1 —Irrelevant→	Conclusion of P_2
The distorted new argument —Relevant→	Conclusion of P_2

Look at the following example:

P_1	Abortion is totally immoral. It should thus be banned by the law.	Original Argument
P_2	People who think abortion should be banned have no respect for the rights of women. They treat women as nothing but baby-making machines. That's wrong! Women must have the right to choose!	Distorted Argument with new premises

6. Red Herring

This fallacy is committed when the arguer diverts the attention of the audience by changing the subject to some totally different issue. And, it has the following form:

1. Topic A is under discussion.
2. A new Topic B is introduced under the guise (cover) of being relevant to Topic A. but, Topic B is actually irrelevant to Topic A.
3. Finally, the status of Topic A is ignored or abandoned.

Eg.	There is a good deal of talk these days about the need to eliminate pesticides from our fruits and vegetables. But, many of these foods are essential for our health. Carrot, for example, is rich in vitamin A, and oranges in vitamin C.

Topic A (under discussion)	The need to eliminate pesticides from our fruits and vegetables.
Topic B (the new subject)	The nutritional contents of fruits and vegetables
Finally, the status of Topic A	ignored

The above example is fallacious, because merely changing the topic of discussion hardly counts an argument against the claim.

The Difference between Straw man and Red Herring Fallacies

		Straw man	**Red Herring**
1.	It is	distortion	Diversion to a new track
2.	Premise	Distorts the original premise & generate new premises. However, the main idea (subject matter) ***remains the same*** in both P_1 & P_2.	The original premise will be changed into a different new premise (subject). i.e., the subject matter of the argument ***is totally changed to a different issue***.
3.	Conclusion	It draws a conclusion from the distorted (the new) premises.	Draws a conclusion from the diverted (the new) premises.
4.	The relation b/n P and C	Irrelevant (from the original Arg.)	Irrelevant

7. Accident

This fallacy is associated with **General Rule**/**Principle**. And, the fallacy is committed when a ***general rule*** is applied to a specific case that it was not intended to cover. It assumes that what is true as a ***general rule*** is also true in every particular case. What makes it fallacious is its assumption that there is no exceptional case on the applicability of a general rule. Hence, the argument proceeds from general rule (generalization) to some accidental and exceptional case.

Eg.	Freedom of speech is a constitutionally guaranteed right. Therefore, Nelson Mandela should not be arrested for his speech that incited the riots last week.	Knifing a person is a crime. Surgery is knifing. Therefore, surgery is a crime.

8. **Missing the Point** *(Ignorantio Elenchi)* (Irrelevant Conclusion)

"Ignorantio Elenchi" means ignorance of the proof/evidence. The arguer is ignorant of the logical implication of his premises (evidences). Hence, you have good evidence, but you drew irrelevant conclusion. In that case you ***missed the point*** (the evidence) in your conclusion.

Eg.	Mekelle University has a lot of problems. Among other things, student services and facilities, for example, are inadequate. Moreover, many of the instructors are not experienced. Therefore, the university should be entirely closed
The expected correct conclusion is: It implies that the quality of education given in MU is poor. And, the right solution is to solve those mentioned problems, not closing the university.	

II. Fallacies of Weak Induction

These are types of usually appeared in inductive arguments. And, they focus on the weak inductive reasoning. i.e., here the concern is *not "the issue of relevance",* rather the *strength* between premise and conclusion. They occur not because the premises are logically irrelevant to the conclusion as in the case of Fallacies of Relevance, but because the premise is not strong enough to support the conclusion. The fallacies of weak induction are thus types of very weak inductive reasoning.

	Types of Inductive Argument	**Their Weakest version (Fallacy)**
1.	Prediction	–
2.	Argument from Analogy	Weak Analogy
3.	Inductive Generalization	Hasty Generalization
4.	Argument from Authority	Appeal to Unqualified Authority
5.	Argument based on Sign	–
6.	Causal Inference	False Cause
		Slippery Slope
		Appeal to Ignorance

9. Appeal to Unqualified Authority

Authority refers to either a witness or expertise in a profession or government official. This fallacy occurs when the cited authority lacks credibility due to one of the following reasons:

i) When the authority ***lacks expertise*** in a certain profession
ii) When the authority has ***bias or prejudice***
iii) When the authority has ***the motive to lie or disseminate false information***.

Eg.	Dr. Daniel, our family physician, has stated that the creation of Muonic atoms of Tritium holds the key to producing a sustained nuclear fusion reaction at room temperature. In view of Dr. Daniel, we must conclude that this is indeed true.
The argument deals with nuclear physics, but the authority, Dr. Daniel, is a physician. He lacks credibility due to lack of expertise on nuclear physics.	

10. Appeal to Ignorance

It's committed when a conclusion is supported by lack of evidence in the premise. Here, unlike the Fallacy of Missing the Point, the problem resides in the premise.

NB: Don't mix up "Ignorance of the Proof (Missing the Point)" with that of "Appeal to Ignorance" the problem of the former is on the conclusion, whereas the latter is on the premise (evidence). There are two ways for Appeal to Ignorance fallacy to be committed:

1. Arguing that something is **true** because no one has proved it to be **false**.
2. Arguing that something is **false** because no one has proved it to be **true**.

Eg.	Life after death is a myth, because no one has proved that it's real.
	Life after death is real, because no one has proved that there is no such thing at all.
	No one has ever seen Mr. Teklay drink a glass of wine, beer or any other alcoholic beverage. It implies that Mr. Teklay is a teetotaler (nondrinker).

However, the following argument is not appeal to ignorance:
"No one has ever seen Zeray playing tennis. Therefore, Zeray is **probably** incapable of playing tennis."

11. Hasty Generalization

Here the word ***"Hasty"*** refers to being too hurried or rush to a conclusion from few samples. The arguer proceeds from a very few samples (evidences) quickly to a generalized conclusion. The fallacy occurs when the sample is not representative of the groups.

Eg.	Abrehet went to Et-Fruit to buy of orange. To help her decision, the retailer gave her two oranges to taste. Fortunately, Abrehet has found the two oranges sweetly. She concluded that all the oranges in the Et-Fruit are sweetly and bought five kilos of orange.

- In its argument **form**, *Hast Generalization* is a converse (reverse of) *Accident*.

	Type of Argument	**Premise**	**Conclusion**
1.	Accident	General ⟶	Particular
2.	Hast Generalization	Specific (few samples) ⟶	General

12. False Cause

This fallacy is committed on the assumption that an event *X* causes another event *Y*, whereas *X* probably doesn't cause *Y* at all.

- **Assumption**: *X* causes *Y*
- **Reality**: *X* doesn't cause *Y*

It has three varieties: *Post hoc, None Causa Pro Causa and Oversimplified Cause*

i) Post hoc

It's a fallacy of temporal succession (associated with timing). And, it has the following form:

- **Form**: *X* precedes *Y*. it implies that *X* causes *Y*.

This form is fallacies, because the mere coincidence or temporal succession or chronological order between X and Y is not sufficient to establish a causal connection.

Eg.	Teddy is scratched by a cat while visiting his friend. Two days later he comes down with fever. Teddy concludes that it's the cat's scratch that caused his favor.

ii) None Causa pro Causa *(Not the Cause for the Cause)*

This variety of fallacy is committed when what is taken to be the cause of something is not really the cause at all.

Eg.1	It's dark now which makes it very dangerous.	Cause – dark. Effect – danger

However, it's not the dark that causes danger.

Eg.2	There are more laws on the book than ever before and more crimes are being committed than before. Therefore, to reduce crimes, we must reduce the number of laws.

It's fallacious because the increasing number of laws cannot be the cause for the increasing number of crimes.

iii) Oversimplified Cause

This fallacy occurs when a multitude of causes are responsible for a certain effect, but the arguer selects just one of them and represents it as if were the sole cause.

Eg.1	The absence of good governance is the cause of multidimensional problems of Africa.
Eg.2	Education today is not as good as it used to be. Obviously, it's because our teachers are not doing their jobs properly.

13. Slippery Slope

It's a variety of false cause fallacy, and associated with chain of reactions. It assumes that a relatively insignificant first event is suggested to lead to a more significant event, which in turn leads to a more significant event, and so on.

Form: If A, then B, then C, then D… then ultimately/eventually/finally Z.

(i.e., if we allow A to happen, then B, C, D … will happen, and then Z will eventually happen. Therefore, A should not be allowed to happen)

Eg.1	We have to stop their intention of increasing tuition fee. If not, the next thing what they will do is charging us 10,000 birr per semester.
Eg.2	The USA shouldn't get involved militarily in other countries. Once the government sends in a few troops, it will then send in thousands to die. Next, USA will intervene on that country's economy. Then finally the country will be colonized.

14. Weak Analogy

This fallacy is the weakest version of inductive argument based on Analogy. It's committed when the analogy between two things is not strong enough to support the drawn conclusion.

Form:	X resembles (is like) Y. Y has properties P_1, P_2, P_3,… $\therefore$ X has properties P_1, P_2, P_3,…	Both Plato and Aristotle are ancient Greek philosophers. Plato severely criticizes the artists for their imitative nature. It implies that Aristotle also criticized the artists.
But X really is not too much like Y.		

III. Fallacies of Presumption

To "presume" means to assume the given idea as true. These fallacies begin with unwarranted or false assumption, and so fail to establish a conclusion. Fallacies of Presumption are valid deductive argument; but, because of the tricky words contained they are informal fallacies.

15. Begging the Question (Circular Reasoning)

It's fallacious because simply assuming that the conclusion is true in the premises doesn't constitute evidence for the conclusion. And, it has much resemblance to the defected deductive argument form of *Argument from Definition*.

- **Presumption:**- The premise is presumed as true whereas it's debatable or false. Moreover, the conclusion is assumed (contained) in the premise.

This fallacy occurs in two ways:

i) When the conclusion of an argument is used as the premise of the same argument (i.e., the conclusion is indirectly included or assumed in the premise; or the conclusion is re-stated in the premise). In this case both the premise and the conclusion say the same thing.

Eg.1	The Bible is the word of God, because the Bible says so. (= The Bible tells us that it's the word of God. Therefore, the Bible is the word of God.)
Eg.2	Anyone who preaches revolution has a vision of the future, for the simple reason that if a person has no vision of the future he could not possibly preach revolution.

ii) When the final statement, after a chain of argument, is already stated at the first premise (statement).

Eg.	*Ford motor company clearly produces the finest cars in USA*. We know they produce the finest cars because they have the best design engineers. This is true because they can afford to pay them more than other manufacturers. Obviously, they can afford to pay them more because *they produce the finest cars in the USA.*

16. Complex Question (The Fallacy of Interrogation)

In most cases this fallacy begins with forwarding trapping question. And, it always involves two persons – P_1 and P_2. P_1 forwards a misleading (tricky) question to P_2 whose purpose is to trap P_2 in either of his/her answer into acknowledging something that he might not want to acknowledge. Although not an argument as such, a complex question involves an implicit argument.

- **Presumption**:- The tricky question presumes the truth of the answer, and all answers of P_2 appear to endorse that assumption.

Here the question and its answer will be paraphrased to serve as an evidence for the presupposed conclusion.

Eg.	P_1 to P_2	Have you stopped cheating on exam?	The possible answers are "Yes" or "No"

- If "Yes", then P_2 admits that he was cheating on exam.
- If "No", P_2 admits that he is still cheating on exam.
- In both replies, P_2 admits that he is a cheater. This is what P_1 wants, and no room is left for P_2 to protest.

From this question and answer a valid deductive argument will emerge:

Trapping (Complex) Question	**Answer**	**Emerged Argument**
Have you stopped cheating on exam?	Yes	You were asked whether you have stopped cheating on exam. You answered "Yes". Therefore, it follows that you have cheated in the past.
Have you stopped cheating on exam?	No	You were asked whether you have stopped cheating on exam. You answered "No". Therefore, it implies that you are continuing cheating.

It's fallacious because the conclusion is supported by an evidence (premise) which is presumed (paraphrased) from the misleading (tricky) question and answer.

17. False Dichotomy (Either…or…Fallacy)

This fallacy is committed when a ***disjunctive (either….or) premise*** presents two unlikely (extreme or mutually exclusive) alternatives as if they were the only options available. The word ***"False Dichotomy"*** refers to that ***the Dichotomy is false***. Dichotomy means two.

- **Presumption (Assumption)** – There are only two choices/options/alternatives (which is **false**).
- **Reality** – There are more than two options (i.e., there is a 3rd option)

The arguer intentionally selects only the two alternatives which are mutually exclusive in nature (i.e., desirable and undesirable options). This is to lead the audience to the desirable option.

Form	P_1: Either…or… (opposite options) P_2: The undesirable option C: The desirable option	George W. Bush: "In this war against terrorism, other nations are either for or against American.. Other nations would not support terrorists. Thus, the world is with America."

The above argument of President George W. Bush is fallacious because he intentionally hided the third option of being *neutrality*.

The fallacy of *False Dichotomy* is a valid, but unsound deductive argument (disjunctive syllogism). However, it becomes fallacious because the soundness of the argument depends on the presumption that says "there are only two options" which is in reality false.

NB: If the given alternatives (the disjunctive premise) is true (i.e., if we have two options in reality), then the argument would not be fallacious; rather, it would become a valid and sound argument.

Eg.	Either Mekelle is in Ethiopia or in Eritrea. **True** Mekelle is not in Eritrea. **True** Therefore, Mekelle is in Ethiopia. **True**	Because the disjunctive premise is **true**, this argument is not fallacious; but a valid and sound disjunctive syllogism.

18. Suppressed Evidence

This fallacy occurs when the arguer intentionally omits or ignores relevant evidence which might entail a different conclusion.

- **Presumption** – The premises (evidences) listed in the argument are complete, and no evidence is omitted/suppressed.
- **In reality**, however, the evidences are not complete (i.e., there are evidences which are intentionally omitted or suppressed in the argument).

Eg.	Smoking cigarette excites. So, if you always want to be excited, just smoke cigarette.	The arguer intentionally ignores the fact that ***smoking hurts health***, because it would undermine his conclusion.

IV. Fallacies of Ambiguity

These fallacies arise from the occurrence of some form of ambiguity in either in the word or in the statement (premise). And, a conclusion is drawn from the ambiguous word or the ambiguous statement. Ambiguity refers to having two meaning.

19. Equivocation

This fallacy occurs by ambiguous word (i.e., when ambiguity arises from a word)

Eg.	A feather is light. What is light cannot be dark. Therefore, a feather cannot be dark.	The word equivocated is ***"light"*** which is used in two different meaning in P_1 and P_2.

20. Amphiboly

It's an ambiguity which results from ambiguous grammar (syntax) or ambiguous use of punctuation. And, a conclusion is drawn from the wrong interpretation of the ambiguous statement.

Eg.	The anthropologists went to a remote area and took photographs of some native women, but **they** were not developed.	Here the word **"they"** has ambiguous reference between ***"the photographs"*** and ***"the native women."*** Hence, the statement "they were not developed" became ambiguous statement.

The likely interpretation is that "the photographs are not yet printed." However, a person may draw a conclusion based on the wrong interpretation of the ambiguous statement.

V. Fallacies of Grammatical Analogy

Arguments that commit these fallacies are grammatically analogous to other arguments that are good in every respect. Because of this similarity in linguistic structure, such fallacious arguments may appear good yet be bad. The arguer, then, draws mistaken inference (conclusion) from the parts of something to the whole, and from the whole to the parts.

21. **Composition** (erroneous transference of an attribute from the parts of something onto the whole)

The fallacy of composition is committed when the conclusion of an argument depends on the erroneous transference of an attribute from the parts of something onto the whole. In other words, the fallacy occurs when it is argued that because the parts have a certain attribute, it follows that the whole has that attribute too and the situation is such that the attribute in question cannot be legitimately transferred from parts to whole.

Eg.1	*Each atom in this marker is invisible. Therefore, the marker is invisible.*
Eg.2	*Sodium and chlorine, the atomic components of salt, are both deadly poisons. Therefore, salt is a deadly poison.*
Eg.3	*Human beings are made of atoms, and atoms are not conscious. So, human beings are not conscious, either consciousness is an illusion.*

NB: Not every such transference is illegitimate, however. Consider the following argument:

Every atom in this marker has mass. Therefore, the marker has mass.	The attribute is legitimately transferred from parts to the whole.

Caution!!

The Difference between the fallacies of **Composition** & **Hasty Generalization (<u>Examine the Conclusion</u>)**

	Type of Fallacy	**Premise**	**Conclusion**
1.	Composition	Members of a class (part) →	The class itself/the class statement (the whole) (The conclusion says something about the whole ***collectively***, <u>not about every member</u>; i.e., attribute is predicated (affirmed) ***collectively***)
2.	Hasty Generalization	Specific →	General (The conclusion says something about the each and every member of the class; i.e., attribute is predicated (affirmed) distributively)

NB:- To distinguish their difference, one has to **<u>examine the conclusion</u>**.

Eg.1	My brother's Toyota threw a rod after only 25,000 miles. My cousin's Toyota also dropped its oil transmission when it was only six months old. This implies that Toyota Motor Company makes cars that are piles of junks.	**Hasty Generalization** (the attribute is distributed)
Eg.2	Each player in the basketball team is an excellent athlete. Therefore, the team is excellent.	**Composition** (the attribute is collectively)

22. Division (erroneous transference of an attribute from the whole to the parts)

The fallacy of division is the exact reverse of composition. As composition goes from parts to whole, division goes from whole to parts. The fallacy is committed when a person argues that what is true of the whole is also true of its parts. It's a valid deductive argument, but the erroneous/illegitimate transference of an attribute from a whole (or a class) onto its parts (or members) makes it fallacious.

Eg.1	In the war with Palestine, Israel killed innocent people. Therefore, all Israelis are murderers.
Eg.1	Ethiopia is the largest coffee exporter in Africa. Gondar, which is one part of Ethiopia, must be the exporter of coffee.

NB: Like the fallacy of **Composition**, the transfer of attribute from the whole to its parts is not always illegitimate. The following argument contains no fallacy (rather, Valid & Sound Deductive Argument):

This pen has mass. Therefore, the atoms that compose this pen have mass.	*Humans are mortal. Socrates is human. Therefore, Socrates is mortal.*

Caution!! The Difference between the Fallacy of Division and Accident **(Examine the Premise)**

	Type of Fallacy	**Premise**	**Conclusion**
1.	Division	Whole (Class Statement/Property of a Class)	→ Parts
2.	Accident	General Rule (General Statement)	→ Specific case

NB: To distinguish their difference, one has to **examine the premise.**

Eg.1	Knifing a person is a crime. Surgery is knifing. Therefore, surgery is a crime.	Accident
Eg.2	This machine is heavy. So, each part of the machine must be heavy.	Division
Eg.3	The USA army is powerful. Therefore, each USA soldier is powerful.	Division

Summary

Some fallacies can easily be identified by the words they often use.

	Type of Fallacy	**Clue words**
1.	Appeal to Ignorance	…because no one has proved/seen/can show…
2.	Complex Question	Always begins with a question.[1]
3.	False Dichotomy	▪ Either…or… (….or….) ▪ The only option/alternative/choice…. ▪ Two choices/options….and…. ▪ Choose between … and ….
4.	Slippery Slope	▪ If…… ▪ If…..then……eventually/ultimately/finally…. ▪ ……the next thing/time….
5.	Weak Analogy	…like/analogous/similar…
6.	Snobbery	Not for everyone/everybody, for the distinguished few, for the selected few, not for the ordinary people/majority.
7.	Bandwagon	The majority, many/most people, everybody is…
8.	Accident	General Rule

[1] This doesn't mean, however, that all the fallacies that begin with a question is always the fallacy of "Complex Question". Look at the following example:
How can you trust Dr. Daniel on economic issues? He derives a Mercedece car. He can't really care about fighting poverty. (The Fallacy of Against the Person - Circumstantial)