

Logic : Nature & Scope, Laws of thought, Truth and Validity, Argument and Argument forms

1. who is the father of logic?

Ans:- Aristotle is the father of logic.

2. Is it true that 'logos' means thought as expressed in language?

Ans:- it is true that logos means thought as expressed in language.

3. Is logic a positive science?

Ans:- No logic is not a positive science, it is a normative science.

4. What is the ideal of logic?

Ans:- The ideal of logic is truth.

5. Is logic useful for valid thinking?

Ans:- Yes, logic is useful for valid thinking.

6. What are the things included in the. Subject matter of logic?

Ans:- Truth & validity.

7. what is logic?

Ans:- The word "logic" is derived from Greek word "logike". "Logike" is the adjective form of Greek word 'logos' which means "thought". so, etymologically logic is the science of thought expressed in language.

8. Define positive science.

Ans:- Science has been divided into two types - positive & normative. A positive science is one which deals with the things as they really are. A positive science gives explanation of the things as it is. Physics is a positive science so it studies physical phenomena which actually happens in nature.

9. Define normative science.

Ans:- A normative science is one which deals with things they should be. It is called normative because it sets before itself a norm or an ideal & things are judged from the stand point of that ideal. Ethics is a normative science because it refers to the ideal of 'good' and "rightness" &

"wrongness" is judged from the ideal of good. The distinction between positive science & normative science is that of a distinction between things as they are and things as they should be, between real and ideal, between 'is' and 'ought'.

10. Is logic normative science?

Ans: Logic is a science because it determines to know in a systematic way the general principles of correct thinking. Logic is a normative science because it is concerned with the question what ought to think. It sets before itself the ideal of truth. Logic refers to the ideal of truth or judges the correctness of our thinking with reference to the ideal of truth.

11. What is the nature of logic ?

Ans:- If we analyse the nature of logic, we find: a. Logic is concerned with mediate knowledge and not with immediate knowledge. Logic is primarily concerned with the problem of proof. Mediate knowledge requires proof for establishing validity. So, logic is concerned with mediate knowledge only.

b. Logic is concerned with both formal & material truth. Formal truth & material truth are complementary to each other. The distinction between formal truth & material truth is made only for convenience of treatments. Logic is both formal & material as whatever is material must be formal also.

c. Logic is both a science and an art. Science and art are complementary to each other. In logic we can have knowledge of the general principles of correct thinking & at the same time we can attain truth & avoid error by the obligations of the rule in practice. Logic is both a science as well as an art.

d. Logic is a normative science & not a positive science. Logic sets before itself "truth" as an ideal or norm & tries to know the conditions which correct reasoning fulfill.

12. What is your idea about the scope of logic?

Ans:- a. Logic is called a science of thought. Logic is concerned with those thoughts which are related to reasoning. Reasoning is the special kind of thinking which can be termed as inference.

b. The main subject matter of logic is reasoning. Reasoning is not the whole of thought but it is a part of thought. The subject matter of logic includes deductive as well as inductive reasoning. Logic is concerned with valid reasoning or correct thinking with some of its auxiliary processes like definition, discussion etc.

c. Logic is concerned with validity & invalidity of arguments. Reasoning is also known as argument. An argument is a group of propositions where we pass from the given premises to a new conclusion & arguments become valid by following certain rules and invalid by violating those rules. The chief concern of logic is the determination of validity of arguments. Reasoning is the

process of passing from one or more judgments to another which is justified by them & the product is also called a reasoning.

d. Logic discusses some deductive & inductive fallacy which is derived due to violation of certain rules formulated by it.

e. Logic is concerned with certain laws of thought. Logic assumes certain fundamental principles of thought such as law of identity, law of contradiction & law of excluded middle. Logic takes for granted these principles without proof to which all other thoughts must conform in order that they may be valid.

13. Write a short note on utility of logic.

Ans:- a. Logic helps us to think or reason something validly or correctly.

b. Since logical thinking is valid thinking, logic becomes a backbone of every field of enquiry. It helps us to study any subject in a planned, precise & systematic manner .

c. Logic helps us to distinguish between valid arguments from the invalid one. By the application of the rules of logic the fallacy of invalid arguments can easily be detected.

d. Logic is employed in every act of our life though we are not conscious of it. Logic is indispensable in our day day life.

14. Define formal truth & material truth.

Ans: Logic is concerned with formal truth and material truth. Truth means consistency among ideas or thoughts themselves. Truth correspondence of thought or Ideas with facts or things of the world. So there implies two kinds of truth viz., formal truth and material truth. Formal truth means self consistency or freedom from self-contradiction amongst thoughts themselves, eg, a round circle. Material truth means correspondence of thought with things of the actual world e.g, greenleaves of tree. But both don't always go together. Whatever is materially true is also formally true, but whatever is formally may not be materially true.

15. Is logic science & art or both?

Ans:- Scientific knowledge is methodical, general, rational, verifiable, accurate & certain. Science is systematic body of knowledge relating to a particular department of nature. An art is a body of practical rules or techniques for the attainment of certain end. It teaches us how to apply knowledge into actual practice to realise some definite purpose. Logic determines in a systematic manner the general principles of correct thinking. Logic gives us the knowledge of the general principles of correct thinking. So logic is a science. The logic also teaches us how to apply the principles formulated by it in actual practice for the realisation of truth. So logic is an art also. Logic is a systematic study of general principle of correct thinking view to apply that into actual practice for the attainment of truth. Hence logic is both science or an art. Logic teaches us how to attain truth by applying body of scientific knowledge to practice.

16. Write a note on the form of argument.

Ans:- In logic an argument is a set of one or more declarative sentences known as the premises along with another meaningful declarative sentence known as the conclusion. A deductive argument asserts that the truth of the conclusion is a logical consequence of the premises, an inductive argument asserts that the truth of the conclusion is supported by the premises. Deductive arguments are valid or invalid, and sound or not sound. An argument is valid if and only if the truth of the conclusion is a logical consequence of the premise and its corresponding conditional is necessarily true. A sound argument is a valid argument with true premises.

17. Distinguish between argument and argument form?

Ans: - By the form of an argument is meant the way in which the different mutually related propositions are structured . e.g.,

A. If the sun rises then we get light

The sun rises

∴ We get light.

B. If we read then we will pass.

we read

∴ we pass.

If both these arguments are symbolised then we have the same form though their subject matter is different. Let us take another example -

A. If we read then we will pass

we read

∴ we pass

B. Either Ram will come or Hari will come.

Ram will not come.

∴ Hari will come will come

These two arguments are different from matter and form both. We are concerned, with the forms only in symbolic logic and not in any way with their subject matter. Symbolic logic replaces the words by variables.

18. Explain truth and validity with example.

Ans:- An argument consists of proposition. Truth & falsity may be predicted of propositions, but be never of arguments. And the attributes of validity & invalidity can belong only to deductive

arguments never to propositions. There is a connection between validity and invalidity of an argument and the truth and falsity of premises and conclusion. Argument may exhibit different combination of true & false premises & conclusions. Some valid arguments contain only true propositions e.g.

All whales are mammals

All mammals have lungs.

∴ All whales have lungs.

An argument may also consists entirely of false propositions to nevertheless be valid, e.g.,

All spiders have 10 legs.

All 10 legged creatures have wings.

∴ All spiders have wings.

An argument may have premises that are all true & have a true conclusion and nevertheless be Invalid, e.g.,

If I own all the gold in the fort knox then I would be wealthy.

I don't own all the gold in the fort knox.

∴ I am not wealthy.

Arguments with false premises & true Argument conclusion may be valid or invalid. Here is an example of valid argument with false premises and true conclusion, e.g.,

All fishes are mammals.

All whales are fishes.

∴ All whales are mammals.

Here is an example of an invalid argument with false premises & a true conclusion, e.g.,

All mammals have wings.

All whales have wings.

∴ All whales are mammals.

Finally there are invalid arguments whose premises and conclusion are false, e.g.,

All mammals have wings.

All whales have wings.

∴ All mammals are whales.

A form of argument is said to be valid when it cannot be that we take the premises to be true and conclusion to be false. Thus, with a validity though are distinct, they are inter-related. When The argument is valid & the premises are materially true, the conclusion is bound to be materially true. When an argument is valid, all its premises we call it sound.

19. What are the three laws of thought?

Ans: The rules of logic are nearly 2500 years old and date back to Plato and Aristotle who set down the three laws of thought: identity, non-contradiction, and excluded middle. The use of language and logic has been adequate for us to develop mathematics, prove theorems, and create scientific knowledge.

20. What is the law of thought?

Ans: According to the 1999 Cambridge Dictionary of Philosophy, laws of thought are laws by which or in accordance with which valid thought proceeds, or that justify valid inference, or to which all valid deduction is reducible.

Unit 2

Kinds of proposition: Traditional and Modern Classification of proposition, Square of Opposition: Traditional, Aristotelian and Boolean; Existential Import.

1. How many terms are there in a logical proposition?

Ans:- Two

2. Is the Copula a term in a logical proposition?

Ans:- No

3. According to quantity, propositions are classified into two.

4. what is the symbolic name of an particular affirmative proposition?

Ans:- I proposition

5. A judgment when expressed in language is called proposition.

6. In a categorical proposition the relation between the subject & the predicate is without / under condition.

Ans:- without.

7. A judgment is/ is not a mental. Process.

Ans:- is mental process.

8. 'O' proposition is universal/particular negative .

Ans:- Particular negative.

9. The quality is categorical or conditional according to relation.

10. According to mixed principle of quality and quantity propositions divided into 4 kinds.

11. Conditional propositions are divided into hypothetical and disjunctive.

12. How many parts are there in a hypothetical propositions?

Ans:- Two parts.

13. "The sun rises in the east" - Is this a particular proposition?

Ans:- No.

14. Karim is a good boy - is a kind of universal affirmative proposition.

15. In simplification the meaning should not be changed of ordinary sentences.

16. Negative sentences with the words less, few, etc should be transformed into 'I' proposition.

17. On what ground modern logicians classify propositions?

Ans:- Elements of proposition.

18. Basically how many kinds of propositions do we have in modern logic?

Ans:- 3 propositions.

19. In what sense the term 'or' is used in disjunctive proposition?

Ans:- Inclusive sense.

20. 'Thief ! 'Thief!' What kind of proposition is it?"

Ans:- Subjectless Simple proposition.

21. How many kinds of simple proposition do we get in logic?

Ans:- Four.

22. The word 'or' in alternative proposition used in inclusive / exclusive sense.

Ans:- Exclusive sense.

23. Compound proposition is called an atomic/ molecular proposition.

Ans:- Molecular proposition.

24. A proposition which asserts existence of something is general proposition.

25. In modern proposition there are any 2/3/ number of terms.

Ans:- Any number of terms.

26. Connective / structure determine form of proposition.

Ans:- Connective.

27. In a hypometical proposition the implicant is antecedent / consequent/ both.

Ans:- Antecedent

28. Traditional logicians recognise four kind of proposition.

29. A & I are Sub- altern proposition.

30. E proposition distributes both Subject & predicate.

31. Particular propositions do/don't distribute their subjects.

Ans:- Don't distribute their subject.

32. What is a proposition?

Ans:- A proposition is a statement of a certain relation between two terms. There are terms in a proposition & a certain relation between these two terms are stated in a proposition. A proposition must consist of 3 parts, viz., two terms & the sign of relation between them. Of these two terms, one is the subject and other is the predicate. The sign of relation is known as Copula. For example, "Man is mortal", here 'man' & 'mortal' are two terms, 'is' is the copula which stands as the sign is relation between two terms.

33. Explain the modern classification of proposition.

Ans:- In modern logic propositions broadly classified into two types are -elementary proposition and non-elementary proposition. Elementary propositions again are of two types - simple proposition and compound proposition. Non-elementary proposition assume only one form and that is general proposition. Thus in modern logic propositions mainly are of 3 kinds - Simple proposition, compound proposition & general proposition.

34. Define singular and general proposition

Ans:- A singular proposition is one in which the subject is a singular term. E.g. Ram is mortal. A general proposition is one where subject is a general term where we take it in it's entire denotation, e.g. All men are mortal.

35. Define exclusive & exceptive proposition.

Ans: - An exclusive proposition is that in which the predicate is limited in its application to the subject of the words like only, alone, none -but etc. E.g. God alone is perfect. An exceptive

proposition is that in which the subject is limited in its application by the word like, except, save, but etc. All students but one present.

36. Explain the modern analysis of proposition.

Ans: - Modern logicians like Bradley, Johnson. & others have analysed a proposition into its constituents & components. According to them, the elements in which proposition can be analysed are called constituents. The elements which combine other elements of proposition is called component. E.g., Ravi hates John. Here, 'Ravi', 'John', 'hate' are three constituents of the proposition because there are the three elements into which this proposition can be analysed. The constituent 'hate' combines the constituents 'Ravi' & 'John'. So, 'hates' is a component.

37. How does a component differ from constituents of proposition?

Ans: - I) Any element of a proposition is called constituents, whereas only that element which combines other elements of a proposition is called component.

II) A component is universal while the constituent can be particular.

III) The constituent indicate the content of a proposition. The form of a proposition. depends upon the way the constituents are combined.

38 How does a proposition differ from a sentence ?

Ans:- In English grammar, a sentence is a combination of words conveying a definite meaning. There are points of difference between a grammatical sentence and a logical proposition which are as follows—

I) Every grammatical sentence has two parts - a subject & a predicate. But A logical proposition consist of 3 parts, viz. subject, copula & a predicate.

II) In a grammatical sentence we need not mention clearly the quality and quantity. But in every logical proposition we must mention the quality & quantity.

III) A grammatical sentence may be used in any tense - past, present & future. But a logical proposition must always be used in the present tense.

IV) In grammar various kinds of sentences are used, But in logic only assertory sentences are used as logical proposition

V) Grammatical sentences may be true or false & also neither true nor false. But logical propositions are either true or false.

39. Classify proposition according to traditional logic.

Ans:- According to the principle of composition, propositions. Classified into two- a) simple proposition which expresses a single statement, e.g., All men are mortal. B) A compound

proposition which is one that consists of two or more propositions combined together, e.g., Ram is a boy & Sitä is a girl.

According to the principle of relation, propositions are classified into two- (a) Categorical proposition is one in which the predicate is affirmed or denied without any one restriction or condition, e.g No men are perfect. (b) Conditional proposition is one in which the predicate is either affirmed or denied of the subject under certain condition of the form 'if.... then', or 'either...or', If it rains then the ground is wet.

According to the principle of quality, propositions are divided into two types - (a) Affirmative proposition is one which the predicate is affirmed of subject, eg, Some men are wise. (b) Negative proposition is one in which the predicate is denied of the subject, eg, Some men are not wise.

According to the principle of quantity propositions are classified into two - a) universal proposition is one where the predicate is either affirmed or denied of the whole subject, e.g All men are mortal (b) Particular proposition is one in which predicate is either affirmed or denied of part of the subject, e.g. Some men are wise.

According to import of significance, proposition is classified into two (a) Verbal analytic proposition is that in which the predicate merely states the connotation or part of the connotation of the subject, eg All men are rational.(b) Real or synthetic proposition is that in which the predicate doesnot state the connotation or part of the connotation of the subject but gives us a new information about the subject, e.q., All men are biped.

According to modality, propositions are classified into three – a) Necessary proposition is that in which the relation between the subject and the predicate is based on their very nature and constitution & expressed with me highest degree of certainty, e.g Two and two must be four. b) Assertory proposition is that in which the relation between the subject & predicate is based on our experience & hence stated to be true in so far as our experience goes, e.g., Some men are wise. c) Problematic proposition is one in which the relation between the subject & the predicate is based on insufficient knowledge of the real state of things & is thus stated to be merely probable, e.g., He may be a poet.

40. What is fourfold classification of proposition?

Ans:- If the two principle, that is quantity & quality are mixed together, then according mixed principle of quantity and quality proposition is of 4 kinds. This kind of classification is called four fold classification of proposition. This is also called traditional scheme fold scheme of proposition.

The four fold propositions are-

1) Universal Affirmative proposition :- In this kind of proposition the predicate is affirmed of the whole of the subject. This is symbolised as A, e.g. All mothers are kind hearted.

2) universal negating proposition :- In this kind of proposition, the predicate is denied of the whole of the subject. This is symbolically represented as E, e.g. No men are perfect.

3) Particular affirmative proposition:- In this kind of proposition the predicate is affirmed of the part of the subject. This is symbolised as 'I', e.g., Some men are wise.

4) Particular negative proposition:- In this kind of proposition the predicate is denied of the part of the subject. It is symbolically represented as O, e.g., Some men are not wise.

41. What is simple proposition? Explain its different kinds.

Ans:- Simple proposition is a proposition that consists of only one statement. In a simple proposition we don't find more than one component statement as such proposition conveys only one information or fact, e.g., It is raining today. Simple propositions are classified into 4 types.

A) subjectless proposition:- It is the most primitive & simplest kind of proposition. In this kind of proposition there is no subject though the proposition makes a definite & meaningful statement. Subjectless propositions are of two types-

i) Exclamatory proposition, eg, Snake! Snake!

ii) Impersonal proposition, eg It rains.

B) Subject -predicate form:- In the subject predicate form of proposition, a statement is made about an individual as possessing some attribute, eg., The ball is red.

C) Relational proposition:- When in a proposition a relation is indicated between two or more terms, it is called a relational proposition, eg, The teacher teaches the student.

D) Class-membership proposition: The proposition which expresses that an individual or an object is members of a class is called class membership proposition, e.g., Rabindranath was a poet.

42. What is compound proposition? Explain its different kinds.

Ans:- A compound proposition is that which contains two or more statements. There are various ways in which propositions are combined & on the basis of the ways of combining propositions, compound proposition is classified into 4 kinds:-

(a) Conjunctive proposition : A conjunctive proposition is a kind of compound proposition formed of two or more simple propositions with the conjunction 'and', e.g., Ram is a boy and Sita is a girl.

(b) Implicative proposition :- An implicative proposition is a kind of compound proposition which is formed by combining two or more simple propositions in which one of the constituent propositions implies the other implicative proposition, eg, If you read then you will pass. Here, the constituent propositions – 1. you read 2. You will pass. The first proposition implies the second one.

(c) Alternative proposition:- An alternative proposition in which there are less or more alternatives. In alternative proposition, one of the alternative is asserted to be true. This proposition contain the expression not both, e.g., He is not both intelligent and good looking.

(d) Disjunctive proposition:- A disjunctive proposition is a kind of compound proposition which asserts that both the constituent proposition cannot be false but can both be true. In this proposition disjuncts are joined by 'either....or'. e.g., Either he is good looking or intelligent. Here, the disjuncts are – 1. He is good looking 2. He is intelligent.

43. What is general proposition? Explain its different kinds.

Ans:- General proposition is that which asserts that one class is wholly or partially included in or excluded from another class. In other words, a general proposition is that which asserts relation between two classes, eg 1. All men are mortal. 2. No new me monkeys. General propositions are of three kinds:-

A. Existential proposition:-An existential proposition is hat what which directly affirms or denies the existence of something, e.g, 1. Mountains exist. 2. There is no golden mountain.

B. One - predicate universal proposition:- An one predicate universal proposition is that which either affirms or denies a property about the whole class, eg 1. All things change. 2. Nothing to permanent.

C. General proposition asserting relation between two classes :- A general proposition asserting relation between two classes in that which states that one class is wholly or partially included in or excluded from another class, eg, 1. All poets are men. 2. Some Indians are not poets.

44. Analyze the drawbacks of the traditional analysis of proposition.

Ans:- 1. According to traditional logicians every topical proposition must have two terms. But we view cannot be accepted. It is seen that very few propositions are two termed. Propositions may or subjectless also. Again a proposition have any number of constituents. but this s view is not taken in traditional analysis.

2. According to traditional logicians if any propositon is not in the strict logical form, i.e. subject-copula – predicate form then it must be reduced to that form by following the rule prescribed by them. But then also the difference between the relation and the attributes can't be bypassed. Such reduction is logically infertile & practically absurd.

3. Traditional logicians believed that there is only relation of predication between terms. They didnt realise that there are other relations also such as (1) membership of a class (2) inclusion of one class into another class.

45. what are the drawbacks of classification of proposition?

Ans:- 1. Every proposition according to traditional logic is of the order of subject- copula – predicate. But this order is not applicable to the modern logicians. A proposition may be if one word.

2. The traditional classification of proposition into AEIO pre- supposed that every categorical proposition is one of the four form. Thus all propositions are believed to be 'S-P'. But modern logicians objected reducing every proposition to 's_p" form and confining it to this restricted scope. According to them there are other forms of proposition also Modern logicians also criticised the traditional classification of proposition into categorical, hypothetical & disjunctive. Specially traditional treatment of disjunctive proposition is not at all satisfactory.

3. Hypothetical proposition of the traditional logicians is really implicative in nature. There is a necessary relation or implication between the antecedent and the consequent of this kind of proposition, so they are really implicative propositions.

46. what do you mean by distribution. of terms? Explain how terms are distributed in each of the categorical proposition?

Ans:- A Term is said to be distributed when it is taken in its entire denotation, e.g. "All men are mortal" here, the term 'men' is taken in its entire denotation. So, 'men' is a distributed term in this proposition. A term is said to be undistributed if it is taken in its partial denotation, e.g. 'Some new are honest', here, the term 'men' is taken in its partial denotation so it is undistributed term.

A- All Negroes are black.

In this proposition the predicate is affirmed of the whole class of the subject "negroes". So it is taken in its entire denotation and therefore distributed. But the predicate term 'black' is not taken in its entire denotation. because the interpretation of the meaning of proposition indicates that not all black things are beings. Hence, undistributed. So, A proposition distributes its subject only

E- No men are perfect.

In this proposition, the predicate 'perfect' is denied of the whole of the subject 'men' This means the whole class of me subject is excluded from the class of predicate & ine entire denotation of the predicate is excluded from the entire denotation of the subject and therefore both are distributed. So, 'E' proposition distributes both subject and predicate.

I- Some students are clever.

In this proposition the predicate 'clever' is affirmed of part of me subject 'students'. So the subject is obviously taken in its partial denotation and therefore, undistributed. The interpretation of the meaning of the proposition indicates that the whole class of the predicate cannot be covered by the subject. Therefore the predicate is not taken in its entire denotation & thus undistributed. So I proposition distribute neither subject nor predicate.

O- Some mangoes are not sweet.

Here, the predicate 'Sweet' is denied of the part of the subject 'mangoes', so it is obviously undistributed. The interpretation of the meaning of this proposition reveals that a part of the denotation of the subject is included in the entire denotation of the predicate and so distributed. So 'O' proposition distributes its predicate only.

47. Explain Aristotle's square of opposition.

Ans:- Aristotle has used 'opposition' in the popular or ordinary sense. He says that if both of the two propositions are true at the same time, we cannot say that there exists an opposition between them. He rejects the sub-alternation and sub-contrary opposition on this basis. He recognises only two kinds of opposition viz., contrary opposition and contradictory opposition.

Contrary opposition:- Contrary opposition is relation between two propositions which have subject same predicate but which differ in quantity only, eg

A- All men are mortal.

E- No men are mortal.

Here, if one of the proposition is true, the other is false but not conversely.

Contradictory opposition:- Contradictory opposition is the relation between two propositions having the same subject & same predicate but differing in both quality and quantity, e.g.

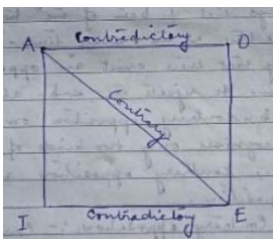
A- All men are mortal.

O- Some men are not mortal.

E- No men are perfect.

I- Some men are perfect.

Here, the truth of one implies the falsity of the other and conversely. The diagram representing the Aristotelian Square of Opposition as follows-



48. Distinguish between Aristotle's Square of opposition and traditional square of opposition.

Ans: Opposition of proposition may be defined as the relation between two categorical propositions having the subject and predicate but differing in quantity only or in quality only or

both in quality and quantity. The square of opposition which is a diagram represents the four kinds of opposition of proposition for kinds. The four kinds –

Sub-alternation:- Sub-alternation is the relation between two propositions which have the same subject, same predicate & also the same quality but which differ in quantity only. It is not regarded as opposition by some thinkers because the two sub-alterns may both be true or false at the same time which is not the actual meaning of opposition, e.g.,

A- All men are mortal.

I- Some men are mortal.

E- No men are perfect.

O- some men are not perfect.

Contrary opposition: Contrary opposition is a relation between two universal propositions which have the same subject and same predicate but which differ in quality only, e.g.,

A- All men are mortal.

E- No men are mortal.

Here, if one of the propositions is true the other is false but not conversely.

Sub-contrary opposition : Sub-contrary opposition is a relation between two particular propositions which have the same subject and same predicate but which differ only in quality. The falsity of one implies the truth of the other but not conversely, e.g.

I- Some men are honest.

O- Some men are not honest.

Contradictory opposition – Contradictory opposition is the relation between two propositions having the same subject & same predicate but differing in both quality & quantity, e.g.

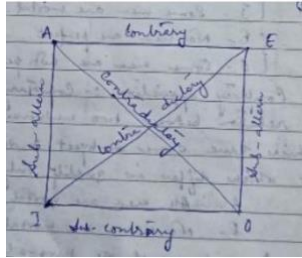
A – All men are mortal .

O - Some men are not mortal.

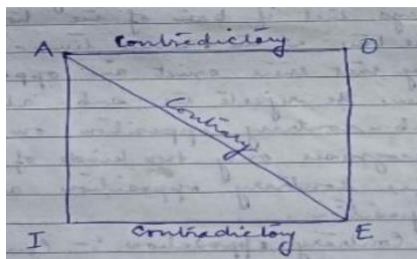
E- No men are perfect.

I- Some men are perfect.

Here, the truth of one implies the falsity of the other and conversely.



Aristotle has used 'opposition' in the popular or ordinary sense. He says that if both of the two propositions are true at the same time, we cannot say that there exists an opposition between them. He rejects the sub- alternation and sub-contrary opposition on this basis . He recognises only two kinds of opposition viz., contrary opposition and contradictory opposition.



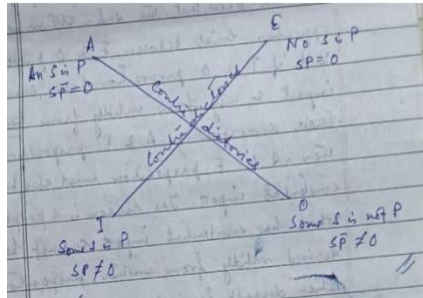
49. Explain Boolean symbolisation of categorical proposition or Boolean square of opposition.

Ans: - The Boolean interpretation of categorical proposition depends on the notion of empty class. It is the notion of an convenient to have a special symbol to represent it. For this purpose we use the symbol (zero) '0' to say that the class denoted by the term 'S' has no members, we write an equal sign between S and (zero) '0'. To assert that there are 'S's is to deny the proposition symbolised by " $S=0$ ". We symbolise that denial by drawing a slanting line through me equality sign. Thus, the inequality $S \neq 0$, saysthat there are S's. Standard form Categorical proposition refer to two classes, where each of two classes is already designated by a Symbol. The class of all things that belonged to them can be represented by just opposing the symbols for the two original classes.

Now, we can symbolise 'E' & 'I' propositions as equations and inequalities. The "E' proposition, 'No S is p' says that no members of class S are members of class P. It means that product of the two classes is empty which is symbolised by the equation ' $SO = 0$ '. The 'I' proposition 'Some S is P' says that at least one member of S is also member of P. This means that the product of the classes S & P is not empty and is symbolised by the inequality " $SP \neq 0$ " (zero). To symbolise A & O propositions, it is inconvenient to introduce a new method of representing class compliments. The compliments of the class "All men" is the class of all things that all are not men, where the letter 'S' symbolises the class of "all men". We symbolise the class of all non-men by S bar.

The 'A' proposition, 'All S is P' says that all members of the class S are also members of the class P. It is symbolised by the equation, $SP(\text{bar}) = 0$. "The O' proposition 'Some S is not P', which is

logically equivalent to I proposition 'Some S is non-p' is symbolised by the inequality $SP(\bar{p}) \neq 0$. It is obvious that A and O propositions are contradictory, when they are symbolised as $SP = 0$ and $SP(\bar{p}) \neq 0$. And it is equally obvious that E' & 'I' propositions are Symbolised $SP = 0$, $SP(\bar{p}) \neq 0$ are contradictory.



50. Write a note on existential import and it's impact on the traditional square of opposition.

Ans:- A proposition is said to have “existential import” if it asserts the existence of objects of some kinds, e.g., “There are books on my desk” has existential import because it asserts the existence of books on my table. But the proposition “There are no ghosts” has existential Import because this proposition does not assert existence of ghost. The difficulty can be appreciated when we consider 'I' and 'O' propositions.

These propositions have existential import because these propositions say that there exists at least member. But if that be so, we face a problem. The opposition which exists between A & I proposition follows validly from its corresponding A proposition. We also know that the sub-alternation opposition exist between E and O proposition. But if I & O proposition have existential import & they follow validly from their corresponding A & E propositions then A & E proposition must also have existential import. The reason is a proposition which has existential import cannot be derived validly from another proposition which does not have such existential import.

Now there arises a problem which is very serious. According to the traditional square of opposition A & O propositions are contradictories. We know that two contradictories cannot both be true or false at the same time. But if the corresponding A and O propositions have existential import as mentioned above then both contradictions could be false. This means that there is some defect in the traditional square of opposition. According to the traditional square of opposition A & E propositions validly imply their corresponding I and O propositions. If it is correct then A & O propositions cannot be contradictories & in that case square is not correct.

To rid the traditional square of difficulties, the notion of pre- supposition has been introduced. We may say that, A, E, I, O pre- suppose that the classes to which they refer are not empty classes, they have members.

The existential pre- supposition is criticized on the following ground :

(a) If We make me pre-supposition we shall never be in a position to assert proposition that denies that the class has members.

(b) Some propositions are there in which it is not supposed that the class has members.

(c) Often we reason without making any pre-suppositions as as we do in science and other theoretical studies.

Such criticisms show that we cannot accept the blanket existential pre-suppositions.

Unit 3

Immediate inference: Conversion, obversion, Contraposition

1. Is it true that, an immediate inference, there are 2 premises?

Ans:- No

2. Obversion is an immediate inference- is it true?

Ans: Yes.

3. How many premises are required to draw a conclusion of a an immediate inference?

Ans- One.

4. Give examples of immediate inference.

Ans- "Conversion, obversion & contraposition.

5. Can 'O' proposition be converted ?

Ans:- No.

6. Is it true that there is one premise in an immediate inference?

Ans:- Yes.

7. Can A proposition be Simply converted?

Ans:- No.

8. Distinguish between immediate inference and mediate inference.

Ans:- In immediate, the conclusion is drawn from only one premise but in case of mediate inference the conclusion is drawn from more than one Premise. In immediate inference there are two propositions one premise and one conclusion. But immediate inference there is one conclusion and more than one premise.

9. What are the points of similarity between immediate and mediate inference?

Answer both mediate and immediate inference are of deductive nature their conclusion cannot be more general than their premise or premises. In both the case of inference we are concerned with formal truth or validity only.

10. What are the different kinds of conversion?

Answer: conversion is of two kinds, namely, simple conversion and conversion per accidens. Simple conversion is that in which the quantity of the conclusion is the same as the quality of the premise, for example

E - No cat is rat

E – No rat is cat.

Conversion per accidens is that in which the quantity of the conclusion is different from quantity of premise.

A - All mothers are kind-hearted.

I - Some kind-hearted beings are mothers.

11. What do you mean by inference by converse relation?

Answer: Inference by converse relation consists in transposing the terms of a proposition and replacing the word indicating the relation between them by its core relations, for example,

A- Plato is the teacher of Aristotle.

A- Aristotle is the student of Plato.

This kind of conversion is possible when the subject and the predicate of a given proposition are a pair of relative terms.

12. What do you mean by conversion by negation?

Answer: According to conversion by negation O proposition can be converted. first of all, an O proposition is to be transformed into an I proposition by negating the sign of negation from the copula adding it to the predicate. And then that I proposition is to be converted according to the general rules of conversion, for example,

O- some men are not wise.

I- Some men are not- wise.

I- some not- wise beings are men.

13. why is conversion by negation not taken as a proper form of conversion?

Answer: According to one of the rules of conversion the quality of the conclusion must be same as that of the premise but here the quality of the premise is changed in the conclusion. The premise

is negative but the conclusion is affirmative. According to another rule the predicate of the premise becomes the subject of the conclusion. But here the subject of the conclusion is contradictory of the given predicate.

14. What do you mean by material obversion?

Answer: According to Bain, there is a form of inference through a version which is known as material or version. In material of version there is a verse inference justified only on examination of the matter of the proposition.

A- knowledge is virtue.

B- A- Ignorance is bad.

15. Distinguish between argument and inference.

Answer: Inference is a mental process but when expressed in language it is called an argument. Every argument is expressed in a premise – conclusion structure.

16. State and explain conversion as a form of immediate inference.

Answer: Conversion is a form of immediate inference in which the subject and the predicate terms are legitimately transposed in the conclusion. In other words, the subject of the premise becomes the predicate and the predicate of the premise becomes the subject in the conclusion in conversion, the premise is called the convertent and the conclusion is called the converse. We can state the rules of conversion as follows:-

1. The subject of the convertent becomes the predicate of the converse and the predicate of the convertent becomes the subject of the converse.

2. The quality of the converting is retained in the converse.

3.No term can be distributed in the converse unless it is distributed in the converted.

The first rule is involved in the very definition of the conversion the second rule is concerned with the quality of the convert int and converts since the term remains same their interchanging of places does not necessitate qualitative change. The third rule is a general principle of all deductive inference. In any conclusive inference we cannot go beyond the evidence, we cannot assert anything not implied in the original proposition. So, a term which is not distributed in the convertend cannot be distributed in the converse. Now, if we apply these rules to four standard form categorical proposition, we will find that only E and I proposition can yield valid conclusion. The converts of E and I propositions are their respective equivalent. But the converse of an A proposition does not in general follow validly from a proposition. The converse of A is I. It cannot be A because in that case the predicate term which is not distributed in the conclusion is distributed in the premise. The converse of A is not the equivalent but its sub implicant. This form of conversion is called conversion by limitation in this process we interchange the subject and predicate and change the quantity of the proposition from universal to particular. Thus, from the

premise All dogs are animals, the conclusion Some animals are dogs can validly be inferred. Finally, it should be observed that converting an O proposition is not in general valid. From the true O proposition Some animals are not dogs has its converse false proposition Some dogs are not animals, we see then that an O proposition and its converse are not in general equivalent. The following table gives a complete picture of a valid conversion-

Convertend	Converse
A- All S is P.	I- some P is S (By limitation)
E-NO S is P.	E-NO P is S
I- Some as is P	I- some P is S
O-Some S is not P	– not valid.

17. State and explain Obversion.

Answer – obversion is a form of immediate inference in which from a given proposition a conclusion is drawn by taking the complement of original predicate as predicate. And also by changing its quality. In this form of inference, the premise is called the obvertend and conclusion is called obverse. We can formulate the rules of the process of inference in the following manner:-

1. The original subject remains as the subject while the contradictory of the predicate becomes the predicate in the conclusion
2. The quality of the obverse is the opposite of the quality of the obvertend .
3. The quantity of the obvertend and the obverse is the same.

We can proceed to give the obverse of the four categorical proposition. The A proposition All politicians are liars has its obverse the E proposition No politicians are non- liars. These two propositions are logically equivalent so either one can validly be inferred from the other. Obversion is a valid immediate inference when applied to any standard form of categorical proposition. Thus, the E proposition, No politicians are honest has its obverse the logically equivalent A proposition All politicians are non- honest. Similarly, the obverse of I proposition Some students are intelligent is the O proposition Some students are not non- intelligent. And finally the O proposition Some students are not industrious has its obverse the I proposition Some students are non- industrious. Every standard form categorical proposition is logically equivalent to its obverse. So, obversion is a valid form of immediate inference for any standard form categorical proposition. To obtain the obverse of a proposition we leave the quality and the subject unchanged, change the quality of the proposition and replace the predicate term by its complement. The following table gives a complete picture of all valid Obversion-

Obvertend	Obverse
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A- All S is P.	E-No S is non- P
E-No S is P.	A- All S is non- P
I- Some S is P.	O- Some S is not non- P
O- some S is not P.	I- some S is non- P.

18. State and explain Contraposition.

Answer:- Contraposition is a kind of immediate inference which introduce no new principles. It can be reduced in a sense to conversion and obversion. To form the contrapositive of a given proposition, we replace the subject term by the contradictory of the predicate term and replace its predicate term by the contradictory of the subject term. Contraposition is most useful in working with a proposition and O proposition we can get from any A proposition to its Contraposition by first obverting it next applying conversion and then applying obversion again. Thus, beginning with All S is P, we obvert it to obtain No S is non- P, which converts validly to No non- P is S whose obverse is All non- P is non- S. Thus the contrapositive of any A proposition is the obverse of the obvertend converse. The contrapositive of the O proposition Some students are not idealist is Some non- idealists are non- students which is logically equivalent to the first. Their logical equivalence can be shown by deriving the Contrapositive in the following schematic form- Some S is not P obversed to Some S is non- P which is converted to Some non- P is S whose obverse is Some non- P is not non- S. Contrapositive of E proposition No S is P is No non- P is non- S which does not follow validly from the original. If we attempt to derive the Contrapositive of an E proposition by successive obversion conversion and obversion, we find the reason for the invalidity the obverse of E proposition No S is P is the A proposition All S is non- P. And it cannot validly be converted except by limitation. If we do convert it by limitation to obtain Some non- P is S then the latter can be obverted to obtain Some non- P is not non- S which we may call the contrapositive by limitation. Contrapositive of I proposition is not in general valid. The reason that contraposition is not generally valid when applied to I proposition can be seen when we attempt to derive the contrapositive of an I proposition. The obverse of I proposition Some S is P is the O proposition Some S is not non- P whose conversion does not in general follow validly from it. Thus, we see that contraposition is a valid form of immediate inference only when applied to A and O propositions. Contraposition is not valid at all for I proposition and for E proposition only by limitation. This may also be presented in the form of a table.

Premise.	Contrapositive
A- All S is P	A- All non- P is non- S
E-No S is P.	O- Some non- P is not non- S
	(By limitation)
I- Some S is P	- not valid

O-Some S is not P O- Some non- P is not
non- S.

19. What is the process of converting definition, tautologous proposition and the like?

Answer: When in an A proposition, the subject and the predicate have the same denotation, it can be converted simply.

1. Definition-

A all men are rational animals

∴ A- All rational animals are man

2. Tautologous proposition-

A- All men are human beings

∴ A-All human beings

3. Proposition in which all the subject and the predicate are definite singular terms

A- Everest is the highest mountain

∴A- The highest mountain is everest.

4. Proposition in which the predicate is the peculiar quality possessed only by the subject,

A- All manner laughing animals

∴ A- All laughing animals are men.

20. Is material obversion a real type of obversion?

Answer: Material obversion cannot be regarded as a real type of operation on the following grounds –

1. According to the rule of the Obversion the subject of the Obvertend becomes the subject of the obverse. But in material Obversion, the contrary of the subject of the obvertend becomes the subject of the obverse.

2. Rule of obversion requires that the predicate of the obverse should be the contradictory of the predicate of the obvertend. But in case of material obversion the predicate of the conclusion is the contrary of the predicate of the given proposition.

3. The quality of the obvertend should be changed in the obverse but in case of material obversion quality of the premise and the conclusion is the same.

4. In deductive inference the conclusion is implicitly contained in the premise and necessarily follows from the premises. But this is not the applicable in case of material obversion.

5. Inference through material obvers requires some practical knowledge or experience of the nature of the subject and the predicate the abortion as a deductive inference is concerned with formal truth and not with material truth.

21. What are the characteristics of deductive inference?

Answer: 1. The conclusion follows from one or more premises.

2. The conclusion necessarily follows from premises as the conclusion is implicitly contained in the premise.

3. The conclusion cannot be more general than the premises as the conclusion necessarily follows from the premises.

4. As the conclusion is implicitly contained in the premises and necessarily follows from the premises, so if the premises are true the conclusion must be true.

5. It is not concerned with the material truth of the conclusion if the conclusion necessarily follows from the premises by following all the rules of the premises, the inference will be formally true or valid.

22. What are the characteristics of inductive inference?

Answer – 1. The conclusion follows from more than one premise.

2. As the conclusion is not implicitly contained in the premises, so the conclusion does not necessarily follow from the premises.

3. The conclusion is more general than the premises.

4. As the conclusion goes beyond the premises, so the truth of the premises cannot prove the truth of the conclusion.

5. Although the conclusion of the inductive argument cannot prove the truth, yet it can help in the discovery of truth.

23. Distinguish between deductive and inductive inference.

Answer: 1. Deductive inference is mainly an inference from the general to the particular. On the other hand, inductive inference is inference from the particular to general.

2. In deductive inference the conclusion necessarily follows from the premises but in inductive inference the conclusion does not necessarily follows.

3. The conclusion of a deductive inference cannot be more general than the premises. But the conclusion of an inductive inference is always more general than the premises.

4. Deductive inference is concerned with the formal truth or validity. Inductive inference on the other and is concerned with material truth of the constituent proposition.

5. In a deductive inference the conclusion cannot go beyond the premises but in inductive inference the conclusion goes beyond the premises.

Unit IV

Mediate Inference: Categorical Syllogism, Figure and Mood of Syllogism

1. Is it true that in a categorical syllogism there is only one middle term?

Ans:- yes

2. which term determine the figure of syllogism?

Ans: Middle term

3. How many valid moods are there in Third figure?

Ans- 6 valid Moods.

4. In the first figure the major premise must be particular proposition — is it true?

Ans- No.

5. What is the name of the predicate of the conclusion of a syllogism?

Ans:- Major term

6. In the second figure the middle term is used subject / predicate a both the premises.

Ans- Predicate

7. In the fourth figure of syllogism there are ____ Valid moods.

Ans:- 5

8. which proposition is used as major premise in the valid moods of the third figure?

Ans- Any proposition can be used as major premise in the valid mood of 3rd figure.

9. In the fourth figure the middle term is used as predicate in the major premise and Subject in the minor premise.

10. How many forms of syllogism are there?

Ans:- 2 forms (Pure & Mixed).

11. How many forms of pure syllogism are there ?

Ans:- 3 forms, viz, Pure Categorical, pure disjunctive, pure hypothetical.

12. How many forms of mixed syllogism are there?

Ans:- 3 forms, viz., disjunctive categorical, hypothetical categorical and dilemma.

13. Explain the structure of standard form categorical syllogism.

Answer: A syllogism is a deductive argument in which a conclusion is inferred from two premises. A categorical syllogism is a deductive argument consisting of three categorical propositions that contain three terms, each occurring twice in the two of the constituent propositions. A categorical syllogism is said to be in standard form when its premises and conclusion are all standard form categorical propositions. The conclusion of a standard form syllogism is a standard form categorical proposition which contains two of the syllogisms 3 terms. The term that occur as the predicate of the conclusion is called the major term and the term which occurs as the subject of the conclusion is called the minor term, in the standard form syllogism –

All men are mortal

All kings are men

∴ All kings are mortal

The term ‘kings’ is the minor term and the term ‘mortal’ is the major term the third term of the conclusion which occurs in both the premises but does not occur in the conclusion is called the middle term in our example, the term ‘man’ is the middle term. The premises of the standard form syllogism are named after the terms that appear in them. The major and the minor terms must each occur in a different one of the premises the premise containing the major term is called the major premise and the premise containing the minor term is called the minor premise in our example stated above, the major premise is All men are mortal and the minor premise is All kings are men. In a standard form categorical syllogism its major premise is stated first, the minor premise second and the conclusion last. It should be emphasized that the major premise is not defined in terms of the premise but as the premise that contains the major term and similarly the minor term is defined accordingly as it contains its minor term.

14. Write a note on the mood of syllogism.

Answer: The mood of a standard form syllogism is determined by the forms of the standard form categorical propositions, it contains. It is represented by three letters the first letter of which names the form of the syllogisms major premise, the second that of the minor premise and 3rd that of the conclusion. In our example stated below since its major premise is an A proposition the minor premise is also an A proposition and so also its conclusion, the mood of the syllogism is a comma for example,

A- All men are mortal

A- All kings are man

∴ A- All kings are mortal

15. Explain the figure of syllogism.

Answer: The mood of standard form syllogism does not completely characterize its form let us consider the two following syllogisms-

1. All great scientists are college graduates- A

Some professionals athletes are college graduates- I

∴ Some professional athletes are great scientists- I

2. A- all artists are egoists

I- Some artists are paupers

∴ I- Some paupers are egoists

Both are the mood AII but they are of different forms we can bring out the differences in their forms most clearly by displaying their logical skeletons. Abbreviating the minor term by S, the major term by P and the middle term by M. The logical skeletons of these two syllogisms are-

1. All P is M. 2. All M is P

Some S is M Some M is S

∴ Some S is P ∴ Some S is P.

In the first the middle term is predicate of both the premises while in the second the middle term is the subject of both the premises. This, the mood of the syllogism does not completely describe the form of a syllogism. The form of a syllogism may be completely described by stating its moods and figure where figure indicates the position of the middle term in the premise it is clear that there are four possible figures a syllogism may have. The middle term may be the subject of the major premise and the predicate of the minor premise or it may be the predicate of both the premises or it may be the subject of both the premises or it may be the predicate of major premise and the subject of the minor premise this different possible position of the middle term constitute the figure, first, second, 3rd and 4th figures respectively. This can be represented in the following way-

First.	Second	Third	Fourth
MP.	PM.	MP.	PM
SM.	SM.	MS.	MS
∴ SP	∴ SP	∴ SP	∴ SP

Thus, a complete description of the form of any standard form syllogism can be given by naming its moods and figure.

16. What are the different forms of syllogism?

Answer: According to the nature of the constituent propositions from the point of view of relation, syllogism is classified into two, namely pure syllogism and mixed syllogism. A pure syllogism is that in which the constituent propositions are of same relation, for example,

All crows are black

This is a crow

∴ This is black

Here, all the propositions are of the same relation, that is, all are categorical.

A mixed syllogism is that in which the constituent propositions are of different relation, for example,

If there is fever then there is rise in temperature

There is a fever,

∴ There is rise in temperature.

Here, the propositions are of different relation, that is, the major premise is hypothetical and the minor premise and the conclusion are categorical.

17. What are the different kinds of pure syllogism?

Answer: Pure syllogism is of three kinds, namely,

1. Pure categorical syllogism
2. Pure hypothetical syllogism
3. Pure disjunctive syllogism

A pure categorical syllogism is that in which all the three propositions are categorical syllogism. A pure hypothetical syllogism is that kind in which all the three propositions are hypothetical proposition. A pure disjunctive syllogism is that in which all the three propositions are disjunctive propositions.

18. What are the different kinds of mixed syllogism?

Answer: Mixed syllogism is of three kinds, namely, hypothetical categorical syllogism, disjunctive categorical syllogism and dilemma. A hypothetical categorical syllogism is that kind of mixed syllogism in which the major premise is hypothetical proposition and the minor premise and the conclusion are categorical propositions. A disjunctive categorical syllogism is that kind of mixed syllogism in which its major premise is disjunctive proposition and the minor premise and the conclusion are categorical propositions. A dilemma is that kind of mixed syllogism in which the major premise is a compound hypothetical proposition, the minor premise is a disjunctive proposition and the conclusion is either categorical or disjunctive proposition.

Unit V

Copi's Six Rules of Syllogism and Venn Diagram Technique for Testing Syllogism

1. BAROCO is a valid mood of _____ figure .

Ans: 2nd

2. In Categorical syllogism from two particular premises conclusion can/can't be drawn.

Ans- Can't be drawn.

3. State the rules of categorical syllogism.

Answer:- 1. A valid standard form categorical proposition must contain exactly 3 terms each of which is used in the same sense throughout the argument any categorical syllogism that contains more than three terms is invalid and is said to commit the fallacy of four terms.

2. In a valid standard form categorical syllogism the middle term must be distributed at least once in the premises the violation of this rule will commit the fallacy of undistributed middle.

3. In a valid standard form categorical syllogism if either term is distributed in the conclusion then it must be distributed in the premises the violation of this rule will lead to either the fallacy of illicit major or fallacy of illicit minor.

4. No standard form categorical syllogism having two negative premises is valid.

5. If either premise of a valid standard form categorical syllogism is negative, the conclusion must be negative.

6. No valid standard form categorical syllogism with a particular conclusion can have two universal premises full the violation of this rule will commit the existential fallacy.

4. What is perfect figure? why is the first figure called the perfect figure?

Answer : The figure in which the dictum de Omni et nullo is directly applicable to the moods is called the perfect figure. The first figure is called the perfect figure because the dictum de Omni et nullo is directly applicable to the moods of the first figure. This dictum lays down that –

a. The major premise must be universal and b. The minor premise must be affirmative in the first figure only the major premise is universal and the minor premise is affirmative in all valid moods. Moreover, in the first figure only all the propositions, that is, A,E,I,O can be deduced as conclusion it is the only figure which proves A proposition.

5. Prove that from two negative premises no conclusion can be drawn.

Answer: A negative proposition is that in which the predicate is denied of the subject. If both the premises are negative then no relation between the major term and the minor term can be established. The major premise is negative this means that there is no connection between the middle term and the major term. Similarly, if the minor premise is negative then also there is no connection between the minor and middle term consequently if both the premises are negative then the major term and the minor term cannot be compared by means of the middle term, as a result, no conclusion can be drawn. For example,

No man are dogs

No cats are men

For the joint function of this two negative premises no conclusion can be drawn this combination leads to the fallacy of negative premises.

6. Prove that every syllogism must have three and only three terms.

Answer: The analysis of structure of syllogism shows that there are three propositions each of them is containing 2 terms so the total number of terms in a syllogism is 6 but all these six terms are not new terms only three are new and each used twice. So, in every syllogism there are actually only three terms, namely, major term, minor term and middle term. In every syllogism, a relation between the major term and the minor term is established in the conclusion with the help of the middle term now, an argument having more than three terms cannot be a syllogism for there will be no common element between the premises, for example,

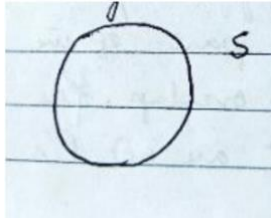
All men are rational animals

All chalks are white

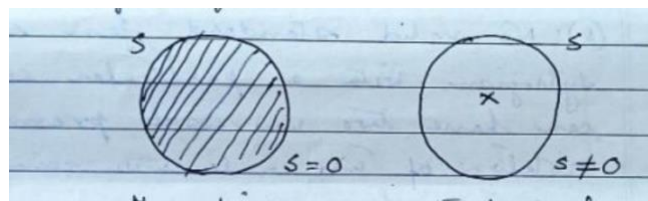
Here, there is no common bond or middle term. So it leads to the fallacy of photo terms again if an argument has only two terms it will be only repetition of the same proposition in the premises as well as in the conclusion. So in every syllogism there must be three and only three terms.

7. Explain the standard form categorical proposition with the help of Venn diagram technique.

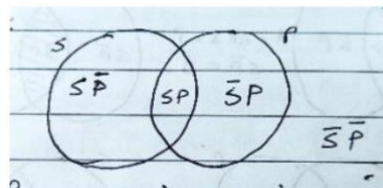
Answer – Standard form categorical proposition referred to two classes. Proposition can be expressed diagrammatically by diagramming the classes to which they refer. All class may be represented by a circle dwelled with the term that designate the class. Thus 'S' may be diagrammed as-



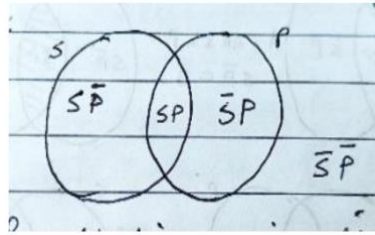
This diagram represents a class, not a proposition. To diagram that has no members, we shade all interior of the circle representing S. To diagram the proposition there are S's we place an X anywhere in the interior of the circle representing S. Thus the two proposition there are no S's and there are S's can be represented by the two diagrams are



To diagram a standard form categorical proposition two classes are required the framework for diagramming any standard form proposition whose subject and predicate terms are evaluated by S&P is constituted by drawing two intersecting circles is shown below –



This figure represents more than two classes. The part of the circle levelled S that does not overlap the circle P diagrams all S's that are not P's represents the products of the classes S and P and the diagrams all things belonging to both of them is leveled as SP. The part of the circle levelled P that does not overlap the circle leveled as diagrams All P's that are not S's and represents the product of the class S is P and leveled as SP. Finally the part of the diagram external to both circles represents all things that are neither in S nor in P and diagrams 4th class leveled as S bar P bar. These levels inserted our figure stands thus –



By shading or inserting X in various parts of the above figure we can diagram any one of the four standard form categorical proposition. To diagram the A proposition All S is P symbolized as $SP\bar{P} = 0$, we simply shade out the part of the diagram that represents the class $S\bar{P}$ indicating that it has no members or is empty. To diagram the E proposition No S is P symbolized as $SP = 0$, we shade out the part of the diagram which represents the class SP to indicate that it is empty. To diagram the I proposition Some S is P symbolized as $SP \neq 0$, we insert X into that part of the diagram which represents the class SP . This insertion indicates that the class product is not empty but has at least one member. Finally for the O proposition Some S is not P symbolized as $S\bar{P} \neq 0$, we insert X into that part of the diagram which represents the class $S\bar{P}$ to indicate that it is not empty, but has at least one member. Now the four standard form of categorical proposition may be shown in the following way:

