

UNIT - I

DATE 22 07 2021

LOGIC

Answer the following questions :-

✓ 1. 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 as expressed in language.)

✓ 2. What is science?

Ans: (A science is a systematic body of knowledge related to a particular department of nature.) (Scientific knowledge must be consistent, methodical and systematic.) (Science confines its investigation to a particular department.) (It is based on reason and it must be verifiable.)

✓ 3. What is Reasoning?

Ans: (Reasoning is the mental process of passing from something known to something unknown.)
* (Reasoning when expressed in language is called an argument.) *

④ Why is logic called science of reasoning?

Ans: (Reasoning is the main subject matter of logic.) (Logic gives us systematic knowledge of certain principles which regulate our reasoning for the realisation of truth and avoidance

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of error. As logic is the scientific discussion of reasoning, so logic is called the science of Reasoning.

5. What is Reasoning? What are the different divisions of reasoning?

Ans: Reasoning may be substituted for thought in logic for clarity. (In reasoning we pass from something known to something unknown.) The something known constitutes the material of reasoning. (Reasoning when expressed in language is called argument.) (In an argument the materials are known as premises and the new knowledge is known as the conclusion.)

(Reasoning is divided into two, deductive and inductive.) (In deductive reasoning the conclusion is drawn from one or more given premises where the conclusion cannot be more general than the premises.) (In an inductive reasoning a general proposition is established as a conclusion on the basis of some observed facts and which is more general than the premises.)

Deductive reasoning

All men are Mortal
Ram is a man
∴ Ram is mortal.

Inductive reasoning

Ram is mortal
Shyam is mortal
Harry is mortal
Rahim is mortal

∴ All men are mortal

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6. What is Knowledge? What are the factors of knowledge?

Ans: Knowledge is a belief by a person that something is true.

✓ A system of knowledge

✓ Correspondence of actually

✓ A belief

7. What are the types of knowledge?

Ans: Knowledge is divided into two, Knowledge by perception and Knowledge by reasoning. Knowledge by perception is derived from the perception of objects of our own mind. Knowledge by reasoning is derived from the reasoning process.

is obtained by other means and is indirect

8. With which subject is logic connected?

Ans: Different branches of logic are concerned with the study of thought and reasoning.

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6. What is Knowledge? What are the different factors of Knowledge?

Ans: Knowledge is the system of ideas corresponding to a system of things accompanied by a belief in such correspondence.)

Knowledge involves three factors:
i) A system of ideas in the mind.)

ii) Correspondance of these ideas) (with a system of actually existing things.)

iii) A belief in such correspondence.)

7. What are the different forms of Knowledge?

Ans: Knowledge may be of two kinds, immediate knowledge and mediate knowledge. Immediate knowledge is that knowledge which is derived from both external and internal perception. (We can directly know the objects of external world as well as our own mental states, for example; the sun, the moon, etc.)

(Mediate knowledge is that which is obtained through the medium of some other knowledge such as inference, testimony and authority.) (Mediate knowledge is also called indirect knowledge.)

8. With which of the two forms of Knowledge is logic concerned?

Ans: Different logicians maintain that logic is concerned only with mediate knowledge

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because logic is primarily concerned with the problem of proof. Immediate Knowledge does not require any proof. Mediate Knowledge requires proof for establishing its validity. So, the view that logic is concerned with mediate Knowledge only appears to be correct one. But, according to Indian logic, logic is concerned with all forms of Knowledge.

9. Define Formal truth and material truth.

Ans: (logic is concerned with both formal truth and material truth.) Truth means consistency among ideas or thoughts themselves. (Truth means correspondance of thoughts or ideas with facts or things of the world.) So, from these two senses of truth 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; for example; a round circle.)

(Material truth means correspondance of thought with things of the actual world, for example; green leaves of a tree.) However, both the truth do not always go together. Whatever is materially true is also formally true but whatever is formally true may not be materially true.

10. Define Traditional Logic.

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Ans: The Greek systematic known logic science successor century further

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Ans: The great thinker, Aristotle has made a systematic presentation of logic commonly known as Aristotelian logic or Traditional logic. It was considered to be a finished science by most of the Aristotle's successors till the middle of the 19th century. But, Aristotelian logic demands further improvement and development.

11. What is Formal Logic?

Ans: (Formal Logic aims at the attainment of formal truth.) It deals with thoughts which are consistent among themselves. In formal logic no question is put regarding the truth of the premises and the premises are taken to be true. We only examine whether the rules of the argument are employed properly and whether the condition necessarily follows from the premises. Formal logic is also known as pure logic or logic of consistency. Generally, deductive logic is called formal logic as it aims at formal truth.

12. Define Material Logic.

Ans: (Material Logic aims at formal as well as material truth.) It deals with the question whether our thoughts actually corresponds to the actual things of the world or not. In material logic we are concerned with the question whether the premises are true as a matter of fact and also whether the conclusion

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corresponds to the actual fact of the world. Material logic is also sometimes known as applied logic or factual logic. Inductive logic is called material logic as it aims at material truth.

13. Is Logic science or an art or both?

Ans: (Scientific knowledge is methodical, general, rational, verifiable, exact, accurate and certain as science is a 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 a 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. But 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.) (Hence, logic is both a science and an art. Logic teaches us how to attain truth by applying the body of scientific

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knowledge

14. "Logic is of arts."

Ans: Logic is science. Every general logic depends on the respective rules for the attainment of certain ends. Logic is a science because it deals with the general principles of correct thinking. It is an art because it teaches us how to apply these principles in actual practice.

15. Define science.

Ans: Science is a systematic study of the general principles of correct thinking with a view to apply them into actual practice for the attainment of truth. It is a science because it deals with the general principles of correct thinking. It is an art because it teaches us how to apply these principles in actual practice.

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Knowledge to practice)

14. "Logic is the science of sciences and art of arts" - Explain.

Ans: Logic is considered to be the ^{signs} science of sciences and art of arts. Every science must conform to the general principles of correct thinking. In order to attain systematic knowledge, logic deals with the general principles of correct thinking. The function of logic is to deal with the basis of all sciences. So every science must depend upon logic. And art also indirectly depends upon logic. Various arts follow rules for the attainment of truth in their own respective spheres, still they follow the rules for the attainment of truth in general with which logic deals. Logic is an out of correct thinking; As such it underlies and directs all other arts. So logic is the basis of all sciences and all arts.

✱✱

15. Define positive science and normative science. Is logic normative science?

Ans: Science has been divided into two; viz; positive and normative. A positive science is one which deals with the things as they really are. A positive science gives us accurate explanation of the things as it is. Physics is a positive science as it studies physical phenomena which actually happens in nature. Next line in normative science is one which

deals with things as they should be. It is called normative because it sets before itself a norm or an ideal and things that are judged from the standpoint of that ideal. It takes is a normative science because it refers to the ideal of 'good' and rightness and wrongness is just from the ideal of 'good'. The distinction between positive science and normative science is that of a distinction between things as they are and things as they should be; between real, ideal, between is and ought.

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

16. What are the characteristics of science?

Ans: i) Scientific knowledge is departmental knowledge. Science divides nature into different departments for its study.

ii) Science studies the general characteristics of the instances coming under it and lays down general rules.

iii) Scientific study is a systematic study.

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Science studies things as they are and by applying the general principles to the particular instances.

iv) Scientific knowledge is causal. Science finds out the causal instances and appliances.

v) Scientific study may be on the basis of what is or it studies what ought to be.

17. Distinguish between positive and normative science.

Ans: i) A positive science is that which studies things as they are with this reference.

ii) A positive science is that which studies things as they are with this reference. It is a judgement of science value.

iii) We find that positive science is the ideal, it is the ideal, it is the ideal.

18. Give the characteristics of science.

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18. Give three differences of science and art.

Ans: i) Science teaches us to know and art teaches us to do.

ii) Science declares that something exists, and teaches us how something must be produced.

iii) Science is concerned with explanation of things and art is concerned with production of things.

19. Determine the nature of logic.

Ans: i) Logic is concerned with mediate knowledge and not with immediate knowledge. Logic is primarily concerned with problem of proof. Mediate knowledge requires proof for establishing validity. So, logic is concerned with mediate knowledge only.

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

iii) 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 and at the same time we can attain truth and avoid error for the application of the rules in practice. So, logic is both

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ii) Logic is positive as an know th must f

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Ans: i) Logic concerne related special termed

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a science as well as an art.

- 1) Logic is normative sense and not a positive sense. Logic sets before itself truth as an idea or norm and tries to know the conditions which connecting reasoning must fulfil.

20. What is your idea of the scope of logic?

Ans: i) Logic is called 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.

- ii) The main subject matter logic is reasoning. For 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 but it's some auxiliary processes like definition, division, etc.

- iii) Logic is concerned with validity and invalidity of arguments. Reasoning is also known as argument an argument is a group of proposition where we pass from the given the premises to a new conclusion. An argument becomes 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 judgements to another which is justified by them and the product is also called a reasoning.

iv) Logic discusses some deductive and inductive fallacies which arise due to violation of certain rules formulated by it.

v) Logic is concerned with certain laws of thought. Logic assumes certain fundamental principles of thoughts 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 confirm in order that they may be valid.

21.4. Write short note on the utility of logic.

Ans: i) (Logic helps us to think or reason something validly or correctly.)

ii) Since logical thinking is valid thinking. Logic has become a backbone of every field of inquiry. It helps us to study any subject in a plain, precise and systematic manner.

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

iv) Logic is do we indispensable

22.8. Indicate

Ans: i) Logic thinking

ii) It is gymnastics

iii) It is a matter

iv) It is of not defect

23. Explain

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iv) Logic is employed in every act of our lives do we are not consists of it. Logic is indispensable in our day to day lives.

22. Indicate the uses of study of logic.

Ans: i) Logic develops the power of abstract thinking.

ii) It is a great intellectual discipline or mental gymnastic.

iii) It prepares the way for the total study and adequate comprehension of any subject matter.

iv) It is also of extreme use in everyday affairs of our life. Student of logic is expected not only to argue correctly but also to detect errors in others.

*23. Explain truth and validity with example.

Ans: An argument consists of proposition. Truth and falsity may be predicated of propositions, but never of arguments. And the attributes of validity and invalidity can belong only to deductive arguments, never two propositions. There is a connection between validity and invalidity of an argument and the truth or falsity of the premises and conclusions. Argument may exhibit different combination of true and false premises and conclusion. Some valid arguments contained only true opposition's.

For example;

All whales are mammals
 All mammals have lungs
 $\therefore$ All whales have lungs

And argument may also consists entirely of false proposition and nevertheless be valid.

For example;

All spiders have 10 legs
 All ten legged creatures have wings
 $\therefore$ All spiders have wings

An argument may have premises that are all true and have a true conclusion and nevertheless be invalid.

For example;

If I own all the gold in the Fort Knox
 then I would be wealthy.
 I do not own all the gold in the Fort Knox
 $\therefore$ I am not wealthy.

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

All fishes are mammals
 All whales are fishes
 $\therefore$ All whales are mammals.

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Here is an example of an invalid argument with false premises and a true conclusion.

For example;

All mammals have wings

Always have wings

∴ All whales are mammals.

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

For example,

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 the conclusion to be false.] Thus, truth and validity though are distinct, they are interrelated. [When the argument is valid and the premises are materially true, the conclusion is bound to be ^{materially} true.] When an argument is valid, all its premises are true, we call it sound.]

21. 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 their premises. Deductive arguments are valid or invalid and sound or not sound will stop 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.

25. 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.

For example,

1. If the Sun rises then we get light
The Sun rises
 $\therefore$ we get light

2. If we read then we will pass
We read
 $\therefore$ 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.

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1. If we
We read
 $\therefore$ We

2. Either
Ram
 $\therefore$ Ram

These two
matter
with the
not in
Symbolic
variables

Extra :-

✓ Who is
 $\rightarrow$ Aristotle

✓ Is it
expressed
 $\rightarrow$ Yes.

✓ Is log
 $\rightarrow$ NO.

✓ What
 $\rightarrow$ Truth

✓ Is log
 $\rightarrow$ Yes

✓ What
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 $\rightarrow$ class

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1. If we read then we will pass
We read
 $\therefore$ We pass

2. Either Ram will come or Harry will come
Ram will not come
 $\therefore$ Harry 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 anyway with their subject matter.
Symbolic logic replaces the words by
variables.

Extra :-

✓ 1. Who is the father of logic?
 $\rightarrow$ Aristotle.

✓ 2. Is it true that Logos means thought as
expressed in language?
 $\rightarrow$ Yes.

✓ 3. Is logic a positive science?
 $\rightarrow$ No.

✓ 4. What is the ideal of logic?
 $\rightarrow$ Truth.

✓ 5. Is logic useful for valid thinking?
 $\rightarrow$ Yes.

✓ 6. What are the things included in the
subject matter of logic?
 $\rightarrow$ 1. classmate Truth and Validity.

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7. Term/ Proposition/ Argument/ Truth/ All of them are included in the scope of logic.

8. Write 3 fundamental laws of thought.

- Ans: i) Law of Identity
ii) Law of Contradiction
iii) Law of Excluded Middle

9. Logic is the study of perception/ inference/ comparison.

10. Logic is an art/science/ both science and art.

11. Logic is the science of beauty/wealth/truth.