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SUBJECT: LOGIC AND CRITICAL THINKING.

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Q.1: What is Aristotelian logic? Discuss the four kinds of categorical propositions with at least five examples of each.

A: ARISTOTELIAN LOGIC:

• **INTRODUCTION:-**He was a Greek philosopher and polymath. Also a student of plato and teacher of Alexander the Great.His writings cover many subjects, including physics ,metaphysics, poetry, theatre, music, logic, rhetoric, linguistic, politics, government, ethics, biology, and zoology. Aristotle's compositions were the first to make an extensive arrangement of western way of thinking, including morals, style, rationales, science, governmental issues, and mysticism.

• **LOGIC:** Aristotle was the first to efficiently study and index the standards of right intelligent thinking. His rationale is significant in light of the fact that it ruled all western idea , including logical idea , until the nineteenth century CE; it additionally had gigantic effect on the advancement of Jewish , Christian and Muslim philosophy . It is still influential today. Although other types of logical system exist, Aristotelian logic is still a powerful tool used to teach reasoning skills in numerous academic disciplines.

➤ **CATEGORICAL PROPORTION:**

In logic , a categorical proposition, or categorical statement, is a proposition that asserts or denies that all or some of the members of one category (the subject term) are included in another (the predicate term). The investigation of contentions utilizing absolute explanations (i.e arguments) shapes a significant part of deductive thinking that started with the Ancient Greeks.

CLASS OF CLASSIFICATION:

Class is assortment of items which shares some predetermined qualities for all intents and purpose

Example:-

-A class of dogs.

-A class of birds.

-A class of banker.

-A class of snacks.

-A class of females.

-A class of male.

There will be 2 class

1) Subject class.

2) Predicate class.

Example:

1) Dogs bark:

All Dogs are barking animals.

Subject Predicate

2) Birds have wings:

Birds are those things which have wings

Subject Predicate

➤ **KINDS OF CATEGORICAL PROPORTION:**

The Ancient Greeks such as Aristotle identified four primary distinct kinds of categorical propositions and gave them standard form (now often called A, E, I and O) . If abstractly , the subject category is named S and the predicate category is named P, the four standard forms are :

1) All S are P. (A form)

2) No S are P .(E form)

3) Some S are P.(I form)

4) Some S are not P.(O form)

1) Universal Affirmative C.P (A form)

(Complete inclusion)

All members of the first class will be fully included in the predicate class.

- All S is P but all P is not S.

Examples:

1) All birds can fly.

2) All Apples are fruits .

True

3) All fruits are Apples.

False

Resultant class:

(A) $SP = O$

2) Universal Negative C.P (E form)

(full exclusion)

According to this categorical proposition one class will be fully excluded from the other class.

-No S are P

Examples:

1) No all student are intelligent.

2) No male student are female student.

Resultant class:

(E) $SP=O$

3) Particular Affirmative C.P(I form)

(Partial inclusion)

Both classes will have same members in common . S will share some of its member with P.

- Some S are P

Examples:

1) Some students are intelligent.

2) Some scientists are philosophers.

Resultant class:

(I)SP not equal O

4) Particular Negative C.P(O form)

(Partial exclusion)

Some members of S will be partially excluded from the whole of the P.

-Some S are not P.

Example:

Some students are not intelligent.

Resultant class:

(O) SP not equal O

Q.2: Discuss the Venn diagram technique for testing syllogism with the help of examples.

A: So as to test a clear cut logic by the technique for Venn graphs, one should initially speak to both of its premises in a single outline. That will require drawing three covering hovers, for the two premises of a standard-structure logic contain three distinct terms-minor terms, significant term, and center term.

Some commonplace instances of arguments are appeared here by their state of mind and figure.

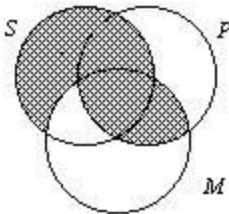
1- EAE_1: The logic has an E explanation for its significant premises, an announcement for its minor premises, and an E proclamation for its decision. By show the end is marked with S (the minor term) being the subject and P (the major term) being the predicate. The situation of the center term is the "left-hand wing."

no M is P

All S is M

no S is P

In the diagram below, how the area in common between S and P has been completely shaded out indicating that "No S is P." The conclusion has been reached by diagramming only the two premises.



2- AAA-1:

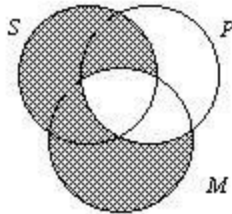
THIS logic is made altogether out of "An" announcements with the M-terms orchestrated in the "left-hand wing" too. Its structure is worked out as:

All M is P

All S is M

All S is P

in the graph beneath, how the main unshaded territory of S is in every one of the three classes. The significant thing to see is that this territory of S is completely inside the P class. Thus, the AAA-1 logic is consistently substantial. In common language the AAA-1 what's more, the EAE-1 arguments are by a wide margin the most of the time utilized.



3- ALL-3

AII-3:

The All-3 logic has the M-terms orchestrated in the subject position- - the correct side of the block.

This logic sets up as:

All M is P.

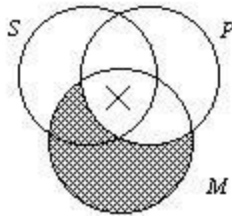
Some M is S.

Some S is P.

when charting the logic, notice how you are

"compelled" to put the "X" from the minor premises in the area of the graph shared by every one of the three classes. The "X" can't go on the P-line in light of the fact that the concealing demonstrates this piece of the SM territory is unfilled. This "coherent" driving empowers you to peruse off the end, "Some S is P." This logic is a genuine model why the general premises ought to be diagrammed before graphing specific premises. If we somehow managed to outline the specific premises first, the "X" would go on the line. At that point, we would need to move it

when we graph the all inclusive premises in light of the fact that the all inclusive premises void a territory where the "X" could have been.



4- ALL-3:

The All-3 has the M term.

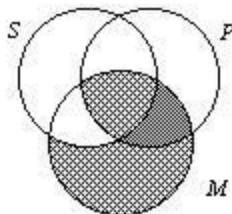
This symbol is written as

All P is M

Some S is M

Some S is P

The outline beneath shows that the "X" could be in the SMP zone or in the SPM territory. Since we don't know precisely which zone it is in, we put the "X" on the line, as appeared. At the point when a "X" is on a line, we don't know with conviction precisely where it is. Along these lines, when we go to peruse the end, we don't have a clue where it is. Since the end can't be peruse with assurance, the All-2 logic is invalid.



Q.3: Discuss symbolic logic in terms of negation, conjunction and disjunction supplemented by examples. Also state the different symbols used in symbolic logic.

A: INTRODUCTION TO SYMBOLIC LOGIC:

Agent reason can in like manner be named as Mathematical method of reasoning

In deductive disputes, the perception of association among premises and end is crucial.

Emblematic rationale is actually a phony language fundamental for looking at inference. In a trademark language—English or some other—there are characteristics that make cautious reasonable assessment problematic: Words may be questionable or dark, the improvement of disputes may be ambiguous, outlines and sayings may overwhelm or misdirect, eager interests may occupy. These difficulties can be for the most part overpowered with a phony language wherein reasonable relations can be figured with exactness.

- **REPRESENTATION OF LOGICAL EXPRESSIONS:**

Representative justification is the technique for addressing reasonable enunciations utilizing pictures and factors, rather than standard language. This has the upside of removing the ambiguity that regularly goes with normal tongues, for instance, English, and grants less complex action. There are various systems of meaningful method of reasoning, for instance, customary propositional justification, first-demand basis and particular basis. Each may have separate pictures, or maintain a strategic distance from the use of explicit pictures.

SYMBOLIC LOGIC IN TERM OF NEGATION:

We keep reality from guaranteeing a sentence by expressing its invalidation. For example; in case we think, 'Sugar causes tooth decay.' is fake, by then we can assert, 'Sugar doesn't cause tooth decay'. Refusal just methods, it isn't the circumstance that p, and may be perused as "not-p". We are not associated with the principle action word by bearing witness to the negation of the declaration. The announcement of nullification of compound sentences is fairly ensnared. For example, 'Sugar causes tooth decay and whiskey causes ulcer'.

SYMBOLIC LOGIC IN TERM OF CONJUNCTION:

We use 'and' to join two sentences to make a singular sentence, which in method of reasoning is called, Conjunction of two sentences.

For example; 'Wed loves John and John venerates Marry' is the blend of 'Wed loves John' and 'John esteems Marry'.

We use the ampersand sign 'and' for blend.

By and by the above sentences can be created as; P&Q; where P is verbalization 1 and Q is clarification 2.

Each declaration is known as a conjunct.

Model:

"Hamza is faultless" (conjunct 1) (Proposition 1)

"Hamza is sweet" (conjunct 2) (Proposition 2)

The picture for blend is a bit (speck •), (Can moreover be "and").

$p \bullet q$, P and q (2 conjuncts)

SYMBOLIC LOGIN IN TERM OF DISJUNCTION:

Dis-intersection of two declarations: "... or... "

Picture is " \vee " (wedge) (for instance $A \vee B = A \text{ or } B$)

Slight (far reaching) sense: can be either case, and maybe both

Model: "Plate of blended greens or baked good" (well, you can have both)

We will treat all dis-intersections in this sense (aside from if an issue explicitly says something different)

Strong (particular) sense: one and only one.

Model: "An or B" (you can have An or B, at any rate one however not both)

The two fragment decrees so solidified are characterized "disjuncts"

Model:

•You will do insufficiently on the test aside from in the event that you study."

P="You will do ineffectually on the test."

S="You study.

• $P \vee S$

Q.4: What are truth value, truth table and validity? Discuss and draw truth tables for negation, conjunction and disjunction.

A: **Truth value:**In rationale and arithmetic, a truth esteem, in some cases called a consistent worth, is a worth showing the connection of a recommendation to truth

Truth table: A truth table is a numerical table utilized in rationale—explicitly regarding Boolean polynomial math, Boolean capacities, and propositional analytics—which sets out the utilitarian estimations of consistent articulations on every one of their practical contentions, that is, for every blend of qualities taken by their sensible factors.

Validity: Validity is the degree to which an idea, end or estimation is all around established and likely relates precisely to this present reality. "Valid" is gotten from the Latin Validus, which means solid. The validity of an estimation apparatus is how much the device estimates what it professes to gauge.

TRUTH TABLE FOR NEGATION:

We keep reality from guaranteeing a sentence by expressing its invalidation.

Model; if we think, 'Sugar causes tooth decay.' is false, by then we can avow, 'Sugar doesn't cause tooth decay'. Forswearing just methods, it isn't the circumstance that p, and maybe perused as "not-p". We are not associated with the fundamental action word by confirming the

nullification of the declaration. The announcement of invalidation of compound sentences is to some degree ensnared. For example, 'Sugar causes tooth decay and whiskey cause ulcer'

TRUTH TABLE

| | |
|----------|-----------|
| P | ~P |
| T | F |
| F | T |

TRUTH TABLE FOR CONJUNCTION:

We use 'and' to join two sentences to make the alone sentences, which in basis is called, Conjunction of two sentences.

For example; 'Wed loves John and John venerates Marry' is the blend of 'Wed loves John' and 'John values Marry'.

We use the ampersand sign 'and' for a blend.

By and by the above sentences can be formed as; P&Q; where P is verbalization 1 and Q is clarification 2.

Each declaration is known as a conjunct.

EXAMPLE:

"Hamza is flawless" (conjunct 1) (Proposition 1)

"Hamza is sweet" (conjunct 2) (Proposition 2)

The image for combination is a speck (dot •), (Can likewise be "&").

- $p \cdot q$, P and q (2 conjuncts);

TRUTH TABLE

| p | q | p•q |
|----------|----------|------------|
| T | T | T |
| T | F | F |
| F | T | F |
| F | F | F |

TRUTH TABLE FOR DISJUNCTION:

Dis-intersection of two decrees: "... or... "

Picture is "v" (wedge) (for instance $A \vee B = A \text{ or } B$)

Delicate (thorough) sense: can be either case, or maybe both

Model: "Plate of blended greens or baked good" (well, you can have both)

We will treat all dis-intersections in this sense (with the exception of if an issue explicitly says something different)

Strong (specific) sense: one and only one.

Model: "An or B" (you can have An or B, in any event one yet not both)

The two-portion announcements so merged are characterized "disjuncts"

Model: You will do incapably on the test with the exception of on the off chance that you study."

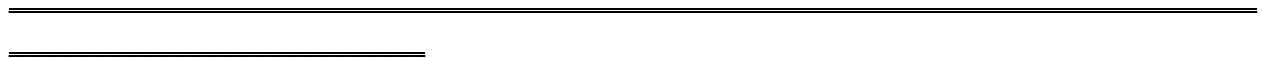
P="You will do inadequately on the test."

S="You study."

- $P \vee S$

TRUTH TABLE

| P | q | p\veeq |
|----------|----------|----------------------------|
| T | T | T |
| T | F | T |
| F | T | T |
| F | F | F |



Q.5: Discussion argument by analogy, casual connection and cause and effect with the help of examples.

- **ANALOGICAL REASONING:**

Analogical reasoning is such a thinking that relies on a closeness. An analogical dispute is an unequivocal depiction of a sort of analogical reasoning that alludes to recognized resemblances between two systems to help the end that some further comparability exists.

At the point when everything is said is done (yet not for the most part), such conflicts have a spot in the class of implicative thinking, since their choices don't follow with conviction yet are simply supported with fluctuating degrees of solidarity. Regardless, the most ideal depiction of analogical conflicts is obligated to examine.

Analogical reasoning is fundamental to human thought and, apparently, to some nonhuman animals moreover. Irrefutably, analogical reasoning has played a huge, anyway a portion of the time puzzling, work to a wide extent of basic reasoning settings. The unequivocal use of analogical disputes, since relic (old events), has been a specific component of coherent, philosophical and genuine reasoning.

Analogies are commonly seen as accepting a noteworthy heuristic activity, as serves to reveal. They have been used, in a wide combination of settings and with noteworthy accomplishment, to make information and to detail likely responses for issues.

- **CAUSAL REASONING:**

Causal thinking is the way toward distinguishing causality: the connection between a reason and its impact. The investigation of causality stretches out from antiquated way of thinking to contemporary neuropsychology; suspicions about the idea of causality might be demonstrated to be elements of a past occasion going before a later one. The primary known proto logical investigation of circumstances and logical results happened in Aristotle's Physics. Causal surmising is a case of causal thinking.

- **CAUSES AND EFFECT:**

Causal connections might be comprehended as an exchange of power. On the off chance that A causes B, at that point An unquestionable requirement transmits a power (or causal capacity) to B which brings about the impact. Causal connections recommend change after some time; circumstances and logical results are transiently related, and the reason goes before the result.

Causality may likewise be derived without a power, a less-ordinary definition. A reason can be expulsion (or halting), like expelling a help from a structure and causing a breakdown or an absence of precipitation causing shriveled plants. People can reason about numerous points (for instance, in social and counterfactual circumstances and arithmetic) with the guide of causal comprehension. Understanding depends upon the ability to comprehend conditions and legitimate outcomes. Individuals must have the option to reason about the reasons for others' conduct (to comprehend their aims and act properly) and comprehend the presumable impacts of their own activities. Counterfactual contentions are introduced by and large; people are inclined to consider "what may have been", in any event, when that contention makes little difference to the current circumstance. Despite the fact that causality is identified with the component, a comprehension of causality doesn't really infer a comprehension of the system.

Circumstances and logical results connections characterize classifications of articles. Wings are a component of the classification "feathered creatures"; this element is causally interconnected with another element of the classification, the capacity to fly.
