UNIT 4: RULES OF CATEGORICAL SYLLOGISM

UNIT STRUCTURE

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4.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- define categorical syllogism
- explain figure and moods of syllogism
- describe standard form categorical syllogism
- discuss rules of categorical syllogism.

4.2 INTRODUCTION

This unit introduces to you the rules of categorical syllogism. The concepts discussed in this unit are: figure and moods of syllogism, standard form categorical syllogism, and rules of categorical syllogism.

4.3 WHAT IS CATEGORICAL SYLLOGISM

A Categorical syllogism is a kind of deductive argument which contains two categorical propositions as premises and one categorical proposition as conclusion. As for instance,

All humans are mortal.

All Indians are humans.

Therefore, All Indians are mortal.

This is the example of categorical syllogism. There are only three propositions and three terms in a categorical syllogism. The above example of categorical syllogism can be logically represented as:

All M is P
All S is M
Therefore, All S is P

The letters M, P, and S stand for Middle term, Major term, and Minor term respectively. The middle term is that which is present in both the premises but not in the conclusion. The predicate term ('P') of the conclusion is the major term. While, the subject term ('S') of the conclusion is known as minor term. There are two premises in a categorical syllogism, major premise and minor premise. The premise which contains the major term is known as major premise, on the other hand the premise which contains the minor term is called minor premise.

As for instance: All M is P Major Premise
AII S is M Minor premise
Therefore, All S is P Conclusion

From the above example, it is clear that in a categorical syllogism, major premise comes first. And the minor premise comes after the major premise. And the last proposition, that is, conclusion comes in the end.

The main characteristic of a categorical syllogism is that all the three propositions are categorical propositions. As for instance,

All men are mortal
Aristotle is a man
Therefore, Aristotle is mortal

This categorical syllogism consists of three universal affirmative proposition that is 'A'.

4.3.1 Figures and Moods of Syllogism

By the concept of figure of a syllogism, we understand the position of a middle term in a categorical syllogism. There are four figures of a categorical syllogism on the basis of the position of middle term. The four figures can be symbolically presented as:

First figure: M P
S M
Therefore, S P

In the first figure, middle term is subject in the major premise and predicate in the minor premise.

Second figure: P M
S M
Therefore, S P

In the second figure, middle term is a predicate in both the premises.

Third figure: M P
M S
Therefore, S P

In the third figure, middle term is subject in both the premises.

Fourth figure: P M
M S
Therefore, S P

In the fourth figure, middle term is predicate in the major premise and is subject in the minor premise.

Every syllogism has a mood, so mood of a syllogism means arrangement of premises and conclusion. The mood of a syllogism is represented by the quality and quantity of the constituent propositions that is A, E, I, and O.

As for instance, AAA mood in the first figure is expressed as:

All M is P
All S is M
Therefore, All S is P

4.3.2 Standard Form of Categorical Syllogism

The validity of a syllogism can be determined only when the syllogism is in a standard form. Again, the rules of validity of a syllogism can be applied only when the syllogism is in a proper standard form. The major premise must first occur in a standard

form of categorical syllogism and the minor premise comes after the major premise. And the conclusion comes in the end. But, in some cases the conclusion may not in the right place, it may be either in the beginning or in the midst of the premises. Thus, in this situation we have to rearrange the argument into standard form of categorical syllogism.

As for instance: Socrates is mortal and all men are mortal, so, Socrates is man. This argument is to be arranged in strict syllogistic order or expressed in standard form of categorical syllogism as:

All men are mortal
Socrates is a man
Therefore, Socrates is mortal

4.4 RULES OF CATEGORICAL SYLLOGISM

In order to determine whether a syllogism is valid or invalid, Aristotle and other logicians formulated certain rules of syllogism. If any of these rules is violated, the syllogism becomes invalid. If none of the rules is broken, the syllogism is valid.

Rule 1: A valid standard form of categorical syllogism must contain exactly three terms. Each of which occurs in the same sense in the argument.

In every categorical proposition the conclusion denotes a relationship between major (predicate) and minor (subject) terms. Again, the conclusion can be justified only when the premises assert the relationship of the major and the minor term to the middle term. If the premises fail to establish the relationship among major term, minor term, and middle term consistently in a syllogism, the syllogism becomes invalid. Therefore, it is clear that each valid syllogism must contain three terms. If more than three terms are involved in a syllogism, the syllogism is invalid.

Rule 2: A valid categorical syllogism holds the view that the middle term must be distributed in at least one of the two premises.

If the middle is not distributed in any of the premises, the syllogism becomes invalid. As for instance–

All P is M
All S is M
Therefore, All S is P

This syllogism is invalid because the middle term is undistributed in both the premises. As a result we can draw the conclusion that the above example of syllogism is invalid. Therefore, in a valid syllogism the middle term must be distributed in at least one premise.

Rule 3: Any term distributed in the conclusion must be distributed in the premises.

This rule shows that if a term is distributed in the conclusion but undistributed in the premises, the syllogism is invalid. But, a valid syllogism is that in which the premises logically entail the conclusion. A term that is distributed in the conclusion but not distributed in the premises means that the conclusion has gone beyond its premises or the conclusion is not necessarily derived from the premises. Therefore, this rule clears that the term which is distributed in the conclusion must necessarily be distributed in the premises.

Rule 4: From two negative premises, we cannot draw the conclusion

Any negative proposition E and O denies class inclusion. It asserts that some or all of one class is excluded from the whole of the other class. So, if two premises are negative in a syllogism, we cannot derive a valid conclusion in the context that the two negative premises cannot make a link among the terms- major term, minor term, and middle term. Therefore, a valid conclusion cannot be derived from the two negative premises.

Rule 5: If one of the premises is negative, the conclusion must be negative.

If the conclusion is affirmative, it always asserts that the S class is contained either wholly or partially in the P class. The affirmative conclusion is followed from the premises only when if the S class is contained either wholly or partially in the M class, and the M class wholly in the P class. Therefore, an affirmative conclusion is followed only when both the premises are affirmative. On the other hand, if the S class is contained either partially or wholly in the M class, and the M class is excluded either wholly or partially

from the P class, then such a conclusion will never follow. Therefore, an affirmative conclusion cannot be drawn from negative premises.

Conversely, a negative conclusion asserts that the S class is excluded either wholly or partially from the P class. But, if both premises are affirmative, they assert class inclusion rather than class exclusion. Thus, an affirmative conclusion cannot be drawn from negative premises.

Rule 6: If both premises are universal, the conclusion cannot be particular.

This rule is not found in the traditional or Aristotle account of the categorical syllogism. The rules of categorical syllogism formulated by Aristotle do not pay attention to the existential import. Rather the concept of existential import of A, E, I and O proposition is found in the Boolean standpoint.

In the Boolean interpretation of categorical propositions, we find that universal propositions– A and E have no existential import. On the other hand, particular propositions– I and O have existential import. Therefore, it can be derived the point that if the premises of a categorical syllogism do not assert the existence of anything at all, the conclusion cannot assert the existence of something. Therefore, the conclusion is unwarranted.



CHECK YOUR PROGRESS

Q.1: What is categorical Syllogism? (Answer in about 20 words)

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Q.2: How many propositions are there in a categorical syllogism? Name them.

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Q.3: How many terms are there in a categorical syllogism?

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Q.4: Define middle term.

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Q.5: Define major term.

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Q.6: Define minor term.

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Q.7: What is figure of a syllogism?

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Q.8: How many figures are there in a categorical syllogism?

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Q.9: Name one logician, who has formulated certain rules in order to determine the validity or invalidity of a syllogism.

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Q.10: Can affirmative conclusion be drawn from two negative premises?

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Q.11: How many terms contained by a valid standard form of categorical syllogism?

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Q.12: Is it possible to draw a particular conclusion from two universal premises?

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4.5 LET US SUM UP

- A categorical syllogism is a kind of deductive argument which contains two categorical propositions as premises and one categorical proposition as conclusion.

- There are only three propositions and three terms in a categorical syllogism.
- There are three terms in a categorical syllogism, viz., major term, minor term and middle term.
- The middle term is that which is present in both the premises but not in the conclusion.
- The predicate term ('P') of the conclusion is the major term.
- The subject term ('S') of the conclusion is known as minor term.
- There are two premises in a categorical syllogism, major premise and minor premise.
- The premise which contains the major term is known as major premise; on the other hand the premise which contains the minor term is called minor premise.
- By the concept of figure of a syllogism, we understand the position of a middle term in a categorical syllogism.
- There are four figures of a categorical syllogism on the basis of the position of middle term.
- In the first figure, middle term is subject in the major premise and predicate in the minor premise.
- In the second figure, middle term is predicate in both the premises.
- In the third figure, middle term is subject in both the premises.
- In the fourth figure, middle term is predicate in the major premise and subject in the minor premise.
- The validity of a syllogism can be determined only when the syllogism is in a standard form.
- The rules of validity of a syllogism can be applied only when the syllogism is in a proper standard form.
- In order to determine the validity or invalidity of a syllogism, Aristotle and other logicians formulated certain rules of syllogism and that if any of these rules is violated, the syllogism becomes invalid and if none of the rules is broken, the syllogism is valid.
- According to the first rule, a valid standard form of categorical syllogism must contain exactly three terms, where each one occurs in the same sense in the argument.

- Rule two says that a valid categorical syllogism holds the view that the middle term must be distributed in at least one of the two premises.
- Rule three says that any term distributed in the conclusion must be distributed in the premises.
- According to the rule four, conclusion cannot be drawn from two negative premises
- Rule five says that if one of the premises is negative, the conclusion must be negative
- Rule six regards that if both the premises are universal, the conclusion cannot be particular.



4.6 FURTHER READING

1) Copi, M. Irving & Cohen, Carl & Jetli, Priyedarshi Jetli & Prabhakar, M. (2006). *Introduction to Logic*. Dorling Kindersley (India) Pvt. Ltd.
2) Hurley, J. Patrick (2007); *Introduction to Logic*; Wadsworth.
3) Hausman, A. & Kahane, H. & Tidman, P. (2007); *Logic and Philosophy*; Wadsworth.
4) Jain, Krishna (1998); *A Textbook of Logic*; D. K. Printworld (P) World.



4.7 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No. 1: A categorical syllogism is a kind of deductive argument which contains two categorical propositions as premises and one categorical proposition as conclusion.

Ans. to Q. No. 2: Three. Major premise, minor premise and the conclusion.

Ans. to Q. No. 3: Three. Major term, minor term and the middle term.

Ans. to Q. No. 4: The middle term is that which is present in both the premises but not in the conclusion.

Ans. to Q. No. 5: The predicate term ('P') of the conclusion is the major term.

Ans. to Q. No. 6: The subject term ('S') of the conclusion is known as minor term.

Ans. to Q. No. 7: By the concept of figure of a syllogism, we understand the position of a middle term in a categorical syllogism.

Ans. to Q. No. 8: Four

Ans. to Q. No. 9: Aristotle

Ans. to Q. No. 10: No

Ans. to Q. No. 11: Three

Ans. to Q. No. 12: No



4.8 MODEL QUESTIONS

A) Very Short Questions:

Q.1: Categorical argument is a kind of Inductive argument or deductive argument?

Q.2: What is the position of middle term in the first figure?

Q.3: What is the position of middle term in the second figure?

Q.4: What is the position of middle term in the third figure?

Q.5: What is the position of middle term in the fourth figure?

Q.6: What do you mean by mood of a syllogism?

Q.7: What are the positions of major term and middle term in the conclusion of a standard form of categorical syllogism?

Q.8: Can negative conclusion be drawn from negative premises?

Q.9: Write the first rule of a categorical syllogism?

Q.10: For a valid categorical argument, distribution of middle term at least once in a premise is compulsory or not?

B) Short Questions: (Answer each question in about 150 words)

Q.1: Discuss categorical syllogism with a suitable example.

Q.2: What are the three terms of a categorical syllogism? Explain with suitable example.

Q.3: Write down the six rules of the categorical syllogism?

Q.4: What are the three premises of the categorical syllogism? Explain with suitable examples?

Q.5: Briefly discuss about figure and moods of a categorical syllogism.

C) Short Notes on: (Answer each question in about 150 words)

Q.1: Standard form categorical syllogism.

Q.2: Four figures of a syllogism.

Q.3: Propositions of a categorical syllogism.

D) Distinguish between: (Answer each question in about 150 words)

Q.1: Premises and terms

Q.2: Figure and mood

Q.3: Second figure and fourth figure

Q.4: Boolean interpretation of categorical propositions

E) Long Questions: (Answer each question in about 200-300 words)

Q.1: Explain broadly the categorical syllogism.

Q.2: What do you mean by figure and moods of a categorical syllogism?

Q.3: Explain in details about the rules of the categorical syllogism.

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