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## UNIT 3 FIGURE, MOOD AND THE POSSIBLE TYPES OF SYLLOGISMS

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### 3.0 OBJECTIVES

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This unit proposes to introduce a very interesting aspect of syllogism, viz. figures and moods. Through a study of figures and moods you will be in a position to gain an insight into the intricacies of categorical syllogism. This is the main objective of this unit. Second objective is to introduce you to the abridged and extended versions of syllogism.

Another equally important objective is to bring out the features of dilemma which is a sort of pseudo- syllogism so that you will be in a position to contrast a genuine argument like syllogism with a pseudo-argument. Thereby another objective is also served. Your acumen to evaluate the logical significance is further sharpened. This is the most invaluable gift of logic.

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### 3.1 INTRODUCTION

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Arguments are of complex nature. It is not possible to bring all arguments, even arguments of one class, under a common head. A detailed analysis of syllogism reveals the hidden complexities of the same. Such a study consists in the discussion of the structure of syllogism which leads to figures and moods. A clear understanding of the structure of syllogism exposes the wealth of syllogistic argument. As usual, the premises have to be taken as true, whether or not they are factually true.

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### 3.2 MOODS OF CATEGORICAL SYLLOGISM

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In the previous unit a brief reference was made to what is known as ‘mood’. It is not possible to fully appreciate the role played by moods in the study of syllogism without prior discussion of what is known as *figure*. Figure and mood together determine the structure of syllogism. An appraisal of the significance of structure in

deductive inference in general and syllogism in particular is made much easier when we deal with ‘figures and moods’ of syllogism. An analysis of the structure of argument in deductive inference is a pre-requisite to the classification of arguments into good (valid) and bad (invalid). Since the very function of logic is to distinguish arguments in the aforesaid manner, a study of figure and mood occupies an important position in our study of syllogism. In order to simplify the task, let us state the arguments in what is called standard-form. Accordingly, the major premise is stated first followed by the minor premise and ending with the conclusion. The following example illustrates what standard-form means:

- 1) All humans are mortal.  
Joseph is a human.  
∴ Joseph is mortal.

Although arguments in ordinary language appear in several forms, it is not at all difficult to restate them in standard-form. First we identify the conclusion which is to be placed in the final position. Whichever premise contains the predicate term of the conclusion automatically occupies the first place because the major premise should be stated first (Kemerling 2010). We notice that ‘mortal’ is the predicate of the conclusion which appears in the first place in the argument followed by the minor premise. Therefore this type of arrangement subscribes to standard-form.

### **The Mood of a Syllogism**

As mentioned earlier, there are four types of categorical proposition; universal affirmative (A), universal negative (E), particular affirmative (I), and particular negative (O). Since a syllogistic argument consists of three categorical propositions, they may occur in any order in the arguments. What is more interesting is the fact that the very same type of proposition may occur thrice. There is no restriction on the number of occasions on which a particular type of proposition occurs in an argument. For example, all three propositions in an argument may be A only. Or they may be I only. Briefly said, the mood of a syllogism is simply a combination of categorical propositions (A, E, I, or O) which the argument comprises of. Suppose that only O proposition comprises of an argument, then the mood of the argument is said to be OOO. Similarly, a syllogistic argument with a mood of OAO has an O proposition as its major premise, an A proposition as its minor premise, and another O proposition as its conclusion; and EIO has an E as its major premise, and an I as the minor premise, and an O as the conclusion; etc. (Kemerling 2010).

Let us consider another example.

- 2) A : All rocks are hard things.  
E : No rocks are liquid.  
I : ∴ Some liquid things are not hard.

The mood of this argument is AEI. This shows that every letter states symbolically the quantity and quality of propositions and every letter occurs in the very same order in which the propositions occur in the argument. Therefore the order in which the three letters occur specifies the mood of the syllogism. Consider the following syllogistic argument.

- 3) E : No women named Deepti are outer island Yapese women.  
A : All outer island Yapese women are weavers of the baskets.  
O : ∴ Some weavers of the baskets are not women named Deepti.

In the above syllogism the minor term (subject of the conclusion) is ‘weavers of the baskets’, the major term (predicate of the conclusion) is ‘women named Deepti’ and the middle term is ‘outer island Yapese women’. Therefore the first premise is the major, second is the minor and the third is the conclusion.

The structure of these arguments is considered for the purpose of illustration. While symbolizing the propositions, let us use the first letter of the term. The letter which appears in the middle stands for the quality and quantity of propositions.

- |                   |              |     |                     |       |
|-------------------|--------------|-----|---------------------|-------|
| 1) Major premise: | All H are M. | HAM | 2. All R are H.     | RAH   |
| Minor premise:    | J is H.      | JAH | No R are L          | REL   |
| Conclusion        | ∴ J is M.    | JAM | ∴ Some L are not H. | ∴ LOH |
- 
- |                   |                    |        |
|-------------------|--------------------|--------|
| 3) Major premise: | No W is Y.         | WEY    |
| Minor premise:    | All Y is B.        | YAB    |
| Conclusion        | ∴ Some B is not W. | ∴ B OW |

One question remains to be answered. How many moods can we list? For the time being, let us restrict ourselves to an incomplete answer. Accordingly, we can list 64 Moods. (At this stage, let us not restrict ourselves to valid Moods). There is no need to list all these 64 Moods. But what is needed is to know how we arrive at this figure because the number is not fixed arbitrarily. There are four kinds of propositions which have to take three positions in such a manner that any proposition can occur in any one of the four different ways; 0, 1, 2 and 3. When we compute all possible arrangements, we arrive at 64. There are two important aspects. First, we have discovered a certain number of structures in which syllogistic arguments can be constructed, and secondly, which we notice later, not all structures to which arguments subscribe are valid. It is in this sense that the logical status of an argument is determined by the structure of that particular argument.

### 3.3 FIGURES OF SYLLOGISM:

It is easy to understand the meaning and significance of figure. The ‘figure’ of a syllogism is determined by the position of ‘middle term’. We have said that the ‘middle term’ appears both in the major and in the minor premises. Therefore its possible positions in premises result in four different configurations. A schematic representation is preferable to verbal description.

Figure 1	Figure 2	Figure 3	Figure 4
M – P	P – M	M – P	P – M
<u>S – M</u>	<u>S – M</u>	<u>M – S</u>	<u>M – S</u>
S – P	S – P	S – P	S – P

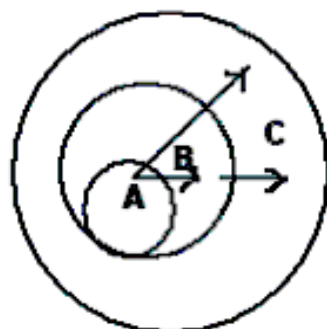
From this scheme it is clear that neither P nor S determines the figure of syllogism. History has recorded that Aristotle accepted only the first three figures. The origin of the fourth figure is disputed. While Quine said that Theophrastus, a student of Aristotle, invented the fourth figure, Stebbing said that it was Gallen who invented the fourth figure. This dispute is not very significant. But what Aristotle says on the first figure is significant.

Aristotle regarded the first figure as most ‘scientific’. It is likely that by ‘scientific’ he meant ‘satisfactory’. One of the reasons, which Aristotle has adduced in defence of his thesis, is what the nature of laws of mathematics and physical sciences suggest.

According to him these sciences establish laws in the form of the first figure. Second reason is that reasoned conclusion or reasoned fact is generally found, according to Aristotle, in the first figure. Aristotle believed that only universal affirmative conclusion can provide complete knowledge and universal affirmative conclusion is possible only in the first figure. Aristotle quotes the fundamental principle of syllogism. 'One kind of syllogism serves to prove that A inheres in C by showing that A inheres in B and B in C'. This principle can be expressed in this form:

Minor: A inheres in B  
Major: B inheres in C  
∴ A inheres in C

Evidently, this argument satisfies transitive relation. This is made clear with the help of this diagram:



Let us consider four examples, which correspond to four figures.

### I

	M	P	
Major Premise:	All artists are poets.	AAP	
	S	M	
Minor Premise:	All musicians are artists.	MAA	
Conclusion:	∴ All musicians are poets.	MAP	
	S	P	

### II

	P	M	
Major Premise:	All saints are pious.	SAP	
	S	M	
Minor Premise:	No criminals are pious.	CEP	
Conclusion:	No criminals are saints.	CES	
	S	P	

### III

	M	P	
Major Premise:	All great works are worthy of study.	GAW	
	M	S	
Minor Premise:	All great works are epics.	GAE	
Conclusion:	∴ Some epics are worthy of study.	EIW	
	S	P	

	P	M	
Major Premise:	No soldiers are traitors.		SET
	M	S	
Minor Premise:	All traitors are sinners.		TAS
Conclusion:	∴ Some sinners are not soldiers.		SOS
	S	P	

We will consider figures in conjunction with moods. Then only knowledge of the ‘figure of syllogism’ permits us to compute the total number of possible moods. Mood is determined by quality and quantity of propositions, which constitute syllogism. Since there are four figures, in all two hundred and fifty six ways of arranging categorical propositions is possible. These are exactly what we mean by moods. However, out of two hundred and fifty-six, two hundred and forty-five moods can be shown to be invalid by applying the rules and corollaries. So we have only eleven valid moods. Even this is not sufficient to have a clear picture. There is no figure in which all eleven moods are valid. Within the framework of traditional logic, in any given figure only six moods are valid. They are as follows:

I AAA, *AAI*, EAE, *EAO*, EIO and AII

II AEE, *AEO*, EAE, *EAO*, EIO and AOO

III *AAI*, AII, IAI, ***EAO***, EIO and OAO

IV *AAI*, IAI, AEE, *AEO*, ***EAO***, and EIO

In all these cases, first letter stands for the major premise, second for the minor and third for the conclusion. Moods are represented above in three ways. Moods in italics and bold form are called strengthened moods, and moods in mere italics are called weakened moods. All other moods are represented in normal form. It is important to know the difference between the first two types. When the laws of syllogism permit two universal premises to yield logically only particular conclusion, then such moods are called strengthened moods. On the other hand, if we deduce particular conclusion from two universal premises, even when the laws of syllogism permit two universal premises to yield logically a universal conclusion, then such moods are called weakened moods.

In this scheme, we notice that EIO is valid in all the figures. Interestingly, IEO is invalid in all the figures. The only difference between EIO and IEO is that the minor and the major premises are only transposed which clearly shows that the position of premises, which is a part of the structure, determines the validity of argument. Though EIO is valid in more than one figure it is one mood in one figure and some other in another figure. Likewise, AEE is valid in the second and the fourth figures. But it is one mood in the second figure and a different mood in the fourth figure.

Since Aristotle argued that the first figure is the perfect figure, he felt the need to transmute all valid arguments in II and III figures to I figure so that if the transmuted mood is valid in I figure, then the corresponding mood in any figure other than the first is also valid. Transmutation from fourth figure to the first figure must have been evolved by the inventor of the former. Reduction is the tool to test the validity of arguments. In the thirteenth century, one logician by name Pope John XXI, devised a technique to remember the method of reducing arguments from other figures to the first figure. This technique is known as mnemonic verses. Accordingly, each mood, excluding weakened moods, was given a special name:

I) Fig:	AAA	BARBARA	III. Fig:	AAI	DARAPTI
	EAE	CELARENT		IAI	DISAMIS
	AII	DARII		AII	DATISI
	EIO	FERIO		EAO	FELAPTON
				OAO	BOCARDO
				EIO	FERISON
II) Fig:	EAE	CESARE	IV. Fig:	AAI	BRAMANTIP
	AEE	CAMESTRES		AEE	CAMENES
	EIO	FESTINO		IAI	DIMARIS
	AOO	BAROCO		EAO	FESAPO
				EIO	FRESISON

The method is like this. If the names begin with C, then the syllogism has to be reduced to the first figure which begins with a C. For example, CESARE (a syllogism of the second figure) has to be reduced to CELARENT. Other consonants of the name have also their significance; 's' (like in CESARE) signifies that the preceding 'E' needs to undergo simple conversion; 'p' signifies that the preceding proposition has to be converted by 'limitation'; 't' signifies that the order of the premises has to be changed; 'st' indicates that two operations, viz., simple conversion and transposition of the proposition represented by the preceding vowel are required to be carried out. BAROCO and BOCARDO are reduced in a different manner. O propositions in both the moods have to be obverted first and then follow the relevant path to effect reduction.

However, the situation in modern logic is very different. The logicians proved that from universal propositions alone particular proposition cannot be derived and vice versa. Accordingly, both strengthened and weakened moods become invalid. Thus in the new scheme the number of valid moods reduces to fifteen.

### Check Your Progress I

**Note:** Use the space provided for your answers.

- 1) What are the factors which determine the mood of a syllogism?

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- 2) Discuss the significance of the 'figure' of categorical syllogism.

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### 3.4 INCOMPLETE SYLLOGISM AND COMPOUND SYLLOGISM

- 1) **Enthymeme:** Enthymeme is called an incomplete syllogism in which one or the other proposition is not stated explicitly. As a matter of fact, such an incomplete syllogism is closer to the way we generally argue in everyday life. If standard-form is the criterion, then it is not logically valid unless what is implicitly understood is taken into consideration. That is, it must be formally completed.

**Examples:** 1. You have hurt your neighbour.

Therefore you have sinned against God.

(Major premise implicitly understood: Those who hurt their neighbours sin against God).

2. Those who hurt their neighbours sin against God.

Therefore you have sinned against god.

(Minor premise implicitly understood: You have hurt your neighbour).

3. Those who hurt their neighbour sin against God.

And you have hurt your neighbour.

(Conclusion implicitly understood: Therefore you have sinned against God).

When the major premise is implicitly understood, enthymeme is regarded as the first-order enthymeme. When the minor premise is implicitly understood, enthymeme is regarded as the second-order enthymeme. When the conclusion is implicitly understood, enthymeme is regarded as the third-order enthymeme. A question may arise in this context. If two propositions are adequate to convey the information, where is the need to have full-fledged syllogism? This question can be answered in two ways. When we deal with learned or well-informed persons or with ourselves, enthymeme will surely serve the purpose. A full – fledged syllogism is needed when we have to educate not so well – informed, if not ill – informed persons. We should not fail to notice close similarity between enthymeme and *svārthānumana* and *parāārthānumana* (inference for self and inference for others). The question can be answered in this way also. Syllogism is formal and enthymeme is informal. Choice is subjective.

- 2) **Sorites:** If an argument consists of three or more than three premises, then such an argument is called sorites. It is also called polysyllogism. There are two kinds of sorites: Aristotelian sorites and Goclenian sorites. The primary rules which govern sorites are the rules of the categorical Syllogism only.

Let us begin with the structure of sorites. In Aristotelian sorites the first premise is minor and the last premise is major. In consecutive premises M is predicate in the first premise and in the next premise subject. In sorites there are two or more than two conclusions which are implicit. Every such hidden conclusion functions as the premise. Therefore a sorites consists of at least three syllogistic arguments and hence it consists of a chain of syllogisms which are interrelated. In order to arrive at the final conclusion these hidden conclusions also must be reckoned.



Consider this example.

Premises	Hidden conclusions (a and b)
1. All A are B.	a. All A are C.
2. All B are C.	
3 All C are D.	3. All C are D.
	<hr/>
	b. All A are D.
4. All D are E	All D are E
<hr/>	
∴ All A are E.	

It is easy to understand this structure. From (1) and (2) we have derived (a). This is hidden because at no point of time is this expressed. When this is conjoined with (3), (a) becomes a premise. So is the case with b. This shows that every hidden conclusion is, in fact, the premise of next argument. In this argument 'a' and 'b' are hidden conclusions which become premises at subsequent stages. In Aristotelian sorites, the subject of the first premise is also the subject of the conclusion and the predicate of the last premise is also the predicate of the conclusion. In the set of hidden conclusions also the same pattern can be noticed. This pattern shows that in Aristotelian sorites the first premise is the minor and the last premise is the major.

Let us consider the rules of Aristotelian sorites.

- 1) Only major premise (last premise) can be negative.
- 2) Only minor premise (first premise) can be particular.

In Goclenian sorites the order is reversed. Consider this example.

2)

Premises	Hidden conclusion (a and b)
1 All A are B.	a All C are B.
2 All C are A.	
3 All D are C.	<u>3 All D are C.</u>
	b All D are B.
4 All E are D.	4 All E are D.
∴ All E are B.	

In this kind the predicate of the conclusion is the predicate of the first premise. Therefore the first premise is major. The subject of the conclusion is the subject of the last premise. Therefore the last premise is the minor. The rules of this kind are as follows.

- 1) Only the first premise (major) can be negative.
- 2) Only the last premise (minor) can be particular.

One point should become clear at this stage. One kind of sorites is the reversal of the other. If we disregard the positions of premises, then the difference between these two kinds becomes insignificant.

### 3.5 DILEMMA

The dilemma consists of three propositions of which two constitute premises and third one is the conclusion. One of the premises is a conjunction of two hypothetical



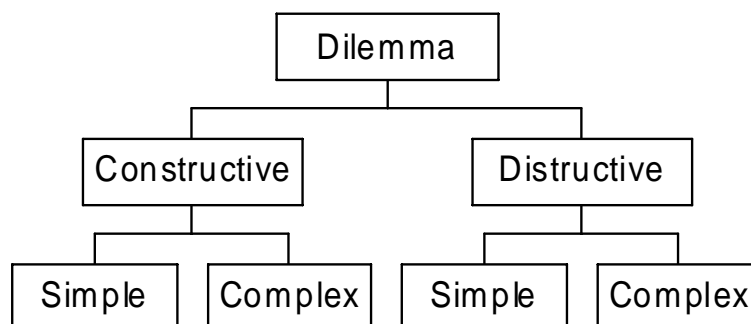
propositions and the other one is disjunctive. The conclusion is either disjunctive or simple. Since the dilemma consists of two hypothetical propositions conjoined by the word ‘and’, it is possible that two different propositions are found in place of antecedents and two different propositions are found in place of consequents. But it is not necessary that it should be so. It is likely that both propositions have a common consequent. If such consequent becomes the conclusion, then, the conclusion is a simple proposition.

Let us consider its so-called value before we proceed further with our analysis. The dilemma, in the strict sense of the word validity, is neither valid nor invalid. This is so because in this particular pattern there is no way of fixing the truth-value of the propositions. The dilemma does not contribute to the growth of knowledge. Nor does it help in testing what is in need of testing. Its significance is only restricted to rhetoric. The dilemma is an example of misuse or abuse of logic. Such a situation arises when a person, who is ignorant of logic, is confronted by an unscrupulous logician. It is most unlikely that the dilemma was ever seriously considered by any professional committed to logic. It, then, means that the dilemma has only negative significance, i.e., to know how not to argue.

### The Structure of Dilemma:

Let us begin with the structure of dilemma. Its uniqueness is quite interesting.

- a) The first premise (p1) consists of two hypothetical propositions conjoined together.
- b) The second premise (p2) is a disjunctive proposition. Its alternatives either affirm or deny the consequents of the hypothetical major premise.



- c) The conclusion is either simple or disjunctive. It either affirms the consequents or denies.

### Kinds of Dilemma:

The kinds of dilemma are represented in the form of a table.

- 1) In a complex constructive dilemma (CCD) antecedents and consequents are different. In the second premise antecedents are affirmed disjunctively and in the conclusion the consequents are affirmed in similar fashion. In a simple constructive dilemma (SCD), both hypothetical propositions have common consequents, though antecedents differ. These antecedents are affirmed disjunctively in the second premise and the consequent is affirmed in the conclusion. Since there is only one consequent, the conclusion is a simple proposition.

- 2) The structure of complex destructive dilemma (CDD) differs slightly from the first kind. The difference is that the consequents and antecedents are denied respectively in the minor premise and the conclusion disjunctively. However, the structure of the first premise remains the same.
- 3) The structure of simple destructive dilemma (SDD) differs slightly from the second kind. In this type also the conclusion is a simple proposition, but negative. The second premise has structure similar to that of p2 of CDD. Now, we can make a list of common features of different kinds of dilemma.

	<b>Dilemma</b>	<b>Common Features</b>
1)	Constructive	Different antecedents
2)	Destructive	Different consequents
3)	Complex	Disjunctive conclusion
4)	Simple	Simple conclusion

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### 3.6 AVOIDING DILEMMA

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Use of dilemma is restricted to some situations. When neither unconditional affirmation of antecedent nor unconditional denial of consequent is possible, logician may use this route. It indicates either ignorance or shrewdness. When we face dilemma, we only try to avoid, but not to refute. There are three different ways in which we can try to avoid dilemma. All these ways only reflect escapist tendency. Only an escapist tries to avoid a problematic situation. Therefore, in logic they do not carry much weight.

- 1) Escaping between the horns of dilemma: Two consequents mentioned may be incomplete. If it is possible to show that they are incomplete then we can avoid facing dilemma. This is what is known as 'escaping between the horns of dilemma'. It should be noted that even when third consequent is suggested it does not mean that this new consequents is actually true. In other words, the new consequent also is questionable.
- 2) Taking the dilemma by horns: In this method of avoiding dilemma, attempts are made to contradict the hypothetical propositions, which are conjoined. A hypothetical proposition is contradicted when antecedent and negation of consequent are accepted. However, in this particular case it is not attempted at all. Moreover, since the major premise is a conjunction of two hypothetical propositions, the method of refutation is more complex. (The negation of conjunction will be introduced at a later stage. For the time being it is enough to know that in this particular instance there is no such attempt.)
- 3) Rebuttal of dilemma: It appears to be the contradiction of dilemma. But, in reality, it is not. In all these cases, the dilemma becomes a potent weapon to mislead the opponent in debate. Therefore none of these methods amounts to the contradiction of opponent's view.

We will consider examples for four kinds, which can be used to illustrate these methods.



The first way of avoiding the dilemma, i.e., escaping between the horns of dilemma can be illustrated using 1 (CCD). It is possible to argue that, when the government wages war, the motive is neither to acquire wealth nor to expand its territory in which case, the government is neither rouge nor colonial. The motive may be to spread its official religion or personal vendetta or it may be to protect its interests. If the last one is the motive, then, it becomes difficult to find fault with such government. Any one of the proposed alternatives or all alternatives to disjuncts may be false. There is no way of deciding what the situation is. The reader can select remaining examples to illustrate this method. Likewise, consider fourth argument to illustrate the second method. I may concede that a person gets up early only because he wants to maintain health. So the purpose is not to worship God. Nor is he a labourer. Again, this is also an assumption.

Rebutting of dilemma requires a different type of example. Consider this one:

- i)
- |         |   |          |
|---------|---|----------|
|         | $p$   | $\neg q$ |
| $p_1$ : | If (teacher is a disciplinarian), then (he is unpopular among students)<br>and      |          |
|         | $\neg p$  | $\neg r$ |
|         | if (he is not a disciplinarian), then (his bosses do not like him).                 |          |
|         | $p$   | $\neg p$ |
| $p_2$ : | (Teacher is a disciplinarian) or (he is not a disciplinarian).                      |          |
|         | $\neg q$  | $\neg r$ |
| $q$ :   | $\therefore$ (Teacher is unpopular among students) or (his bosses do not like him). |          |

A witty teacher may respond in this way.

- ii)
- |         |  |     |
|---------|--|-----|
|         | $\neg p$   | $q$ |
| $p_1$ : | If (teacher is not a disciplinarian), then (he is popular among students)      |     |
|         | $p$  | $r$ |
|         | and if (he is a disciplinarian) then (his bosses will like him.)               |     |
|         | $\neg p$   | $p$ |
| $p_2$ : | (Teacher is not a disciplinarian) or (he is a disciplinarian)                  |     |
|         | $q$  | $r$ |
| $q$ :   | $\therefore$ (Teacher is popular among students) or (his bosses will like him) |     |

Only a student of logic discovers that these conclusions of i and ii are not contradictories (you will learn about it in the forthcoming units) in the strict sense of the term. Hence, there is really no rebuttal.

Further, the dilemma, which an individual faces in day-to-day life, is very different. For example, moral dilemma has nothing to do with the kinds of dilemma which we have discussed so far.

Since the dilemma is a medley of both types of conditional propositions, i. e., hypothetical and disjunctive, it should follow the basic rules of hypothetical and disjunctive syllogisms. It should affirm disjunctively the antecedents in the minor or deny disjunctively the consequents in the minor. The dilemma is powerful if in the major there is a strong cause-effect relationship between the antecedent and the consequent and in the minor the alternatives are exhaustive and mutually exclusive. Again, the former is debatable.

**Check Your Progress II**

**Note:** Use the space provided for your answer.

- 1) What are the characteristics of dilemma?

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- 2) What are the methods of avoiding dilemma?

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### 3.7 LET US SUM UP

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The structure of syllogism is determined by figures and moods. The position of the middle term determines the figure to which syllogism belongs. There are four figures and eleven valid moods. Strengthened and weakened moods are not valid according to modern logic. The dilemma is a shrewd way of getting out of trouble. Escaping between the horns of dilemma, taking the dilemma by horns and rebuttal of dilemma are the ways of avoiding dilemma. Dilemma is not a sound logical way of arguing.

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### 3.8 KEY WORDS

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- Figure** : ‘figure’ of a syllogism is determined by ‘middle term’.
- Mood** : ‘mood’ of a syllogism is determined by the ‘quantity’ and ‘quality’ of the three propositions.
- Dilemma** : A dilemma in logic means an argument that presents an antagonist with a choice of two or more alternatives, each of which appears to contradict the original contention and is inconclusive. The dilemma is a powerful instrument of persuasion and a devastating weapon in controversy.

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### 3.9 FURTHER READINGS AND REFERENCES

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Azzopardi, Salvino. Logic. Pune: Jnana Deepa Vidyapeeth, [1981].

Kemerling, Garth Categorical Syllogisms’ Philosophy Pages, <http://www.philosophypages.com/lg/e08a.htm> 2001. Accessed on July 2, 2010.

‘Introduction to Logic,’ University of Lander, <http://philosophy.lander.edu/logic/index.html>, accessed July, 2010.7

Ling, Lee ‘Categorical Syllogisms’ [http://www.comfsm.fm/~dleeling/geometry/categorical\\_syllogisms.xhtml](http://www.comfsm.fm/~dleeling/geometry/categorical_syllogisms.xhtml)

Mathew, E.P., and Augustine Perumalil. Critical Thinking and Planned Writing. Chennai: Satya Nilayam Publications, 2008.