

*Question 1*

Construct a truth table to prove that the following proposition, when symbolized truth-functionally, is self-contradictory.

If all red beans are rotten then it is not the case that all red beans are edible, but if all black beans are from North Dakota then it is not the case that all red beans are rotten. (Use only material conditional, negation, conjunction, and if necessary parentheses.)

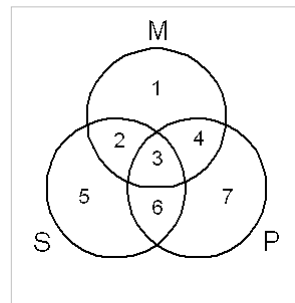
*Question 2*

Prove, using predicate logic and natural deduction that if any object is a circle then it is not a square, and since there is an object that is a square and a quadrilateral, then it must follow that there is an object that is a quadrilateral and not a circle.

*Question 3*

Consider the following categorical syllogism, noting in particular the quantifiers used, and complete the Venn Diagram so that you may determine whether the argument is valid or not from the Boolean point of view.

1. Some M are P.
2. Some S are not M.
3. Some S are not P.



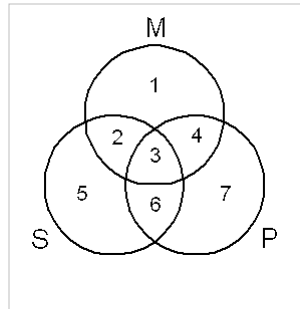
After completing the Venn Diagram,

- a. Areas 3, 4, 5, and 6 are shaded.
- b. There is an X on the line between Areas 2 and 3 and between Areas 3 and 4.
- c. There is an X in Area 4 and in Area 5.
- d. There is an X on the line between Areas 1 and 2 and between Areas 5 and 6.
- e. There is an X on the line between Areas 3 and 4 and between Areas 5 and 6.

## Question 4

Consider the following categorical syllogism, noting in particular the quantifiers used, and complete the Venn Diagram so that you may determine whether the argument is valid from the Boolean point of view. If it is not valid, is it valid after adopting the Aristotelian understanding of quantification.

1. No sheep are mammals.
2. All goats are mammals.
3. Some goats are not sheep.



After completing the Venn Diagram, you may determine that this syllogism is:

- a. Valid from the Aristotelian standpoint because mammals exist.
- b. Valid from the Boolean standpoint.
- c. Valid from the Aristotelian standpoint because goats exist.
- d. Invalid from the Aristotelian standpoint.
- e. Valid from the Aristotelian standpoint because sheep exist.

## Question 5

Read the following categorical syllogism, paying special attention to the universal quantifiers (“no” and “all”), and by applying the method of counterexample determine which of the substitutions (a) through (e) would prove that the categorical syllogism is invalid.

*No symbols of equality are threats to civil order, for no gay marriages are threats to civil order, and all gay marriages are symbols of equality.*

27 Which of the following correctly expresses the form of this argument?

- 1) No S are T.  
No G are T.  
All G are S.
- 2) No G are T.  
All G are S.  
No S are T.
- 3) All G are S.  
No S are T.  
No G are T.
- 4) If G then T.  
If G then S.  
If S then T.

- 5) All S are G.  
No G are T.  
 No S are T.

Which of the following substitutions proves the argument invalid?

- a) S = mammals, T = fish, G = dogs.
- b) S = cats, T = fish, G = mammals.
- c) G = cats, S = mammals, T = fish
- d) T = humble spirits, S = adventurous characters, G = creative individuals.
- e) G = dogs, T = cats, S = animals.

### Question 6

Consider the following paragraph and decide first whether it expresses an argument or not, and if it does express an argument, identify the conclusion.

*The U.S. is the largest single market in the world in terms of national income. It represents roughly 25 percent of the total world market for all products and services. U.S. companies that wish to achieve maximum growth potential must "go global" because 75 percent of the world market potential is outside their home country.*

(Warren J. Keegan and Mark C. Green, *Global Marketing*)

- a. Argument; conclusion: U.S. companies that wish ... must "go global."
- b. Argument; conclusion: It represents ... products and services.
- c. Argument; conclusion: 75 percent of the world market ... home country.
- d. Nonargument.
- e. Argument; conclusion: The U.S. is the largest ... national income.