

Course : CSE 103

Student ID:1705087

verifying student ID:1705012

Chapter:1

Section:1

**BOOK :DISCRETE MATHEMATICS
AND IT'S APPLICATIONS BY ROSEN**

Exercise no. :7

Suppose that during the most recent fiscal year, the annual revenue of Acme Computer was 138 billion dollars and its net profit was 8 billion dollars, the annual revenue of Nadir Software was 87 billion dollars and its net profit was 5 billion dollars, and the annual revenue of Quixote Media was 111 billion dollars and its net profit was 13 billion dollars. Determine the truth value of each of these propositions for the most recent fiscal year.

- a) Quixote Media had the largest annual revenue.*
- b) Nadir Software had the lowest net profit and Acme Computer had the largest annual revenue.*
- c) Acme Computer had the largest net profit or Quixote Media had the largest net profit.*
- d) If Quixote Media had the smallest net profit, then Acme Computer had the largest annual revenue.*
- e) Nadir Software had the smallest net profit if and only if Acme Computer had the largest annual revenue.*

ANS :

a) **Proposition** : Quixote Media had the largest annual revenue.

Logic : This is false, because Acme's revenue was larger.

Truth value : False

b) **Proposition** : Nadir Software had the lowest net profit and Acme Computer had the largest annual revenue.

Logic : Here both parts of this conjunction are true , so the statement is true.

Truth value : True

c) **Proposition** : Acme Computer had the largest net profit or Quixote Media had the largest net profit.

Logic : Here the second part of this disjunction is true, so the statement is true.

Truth value : True

d) **Proposition** : If Quixote Media had the smallest net profit, then Acme Computer had the largest annual revenue.

Logic : Here the hypothesis of this conditional statement is false and the conclusion is true, so by the truth-table definition we can say that this is a true statement.

Truth value : True

e) **Proposition** : Nadir Software had the smallest net profit if and only if Acme Computer had the largest annual revenue.

Logic : Here both parts of this biconditional statement are true , so by the truth-table definition we can say that this is a true statement.

Truth value : True