# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY

SUBJECT: DISCRETE MATHEMATICS (CSE 103)

BOOK EXERCISE PROBLEMS(CHAPTER-1, SECTION-1)

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**QUESTION : (** CHAPTER 1, EXERCISE 1, QUESTION NO. 17**)**

Determine whether each of these conditional statements
is true or false.
**a)** If 1 + 1 = 2, then 2 + 2 = 5.
**b)** If 1 + 1 = 3, then 2 + 2 = 4.
**c)** If 1 + 1 = 3, then 2 + 2 = 5.
**d)** If monkeys can fly, then 1 + 1 = 3.

**SOLUTION** :

All the above questions have one thing in common. There is a an **if(hypothesis) then(conclusion)..** type statement.In each case, we simply need to determine the truth value of the hypothesis and the conclusion, and then use the definition of the truth value of the conditional statement. The conditional statement is true in every case except when the hypothesis (the "if" part) is true and the conclusion (the "then" part) is false.

**p=** hypothesis.

**q=** conclusion.

Then **p->q ≡ ¬ p∧q** which is false iff p is true but q is false.

a. 1+1 is true but 2+2=5 is false. So p=true and q=false. So statement is false.
b. 1+1=3 is false and 2+2=4 is true. So p=false and q=true. So statement is true.
c. 1+1=3 is false and 2+2=5 is true. So p=false and q=false. So statement is true.
d. “monkeys can fly” – this statement is false and 1+1=3 is false too. Hence by rule, the statement is true.