BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY

ASSIGNMENT ON DESCRETE MATHEMATICS

(EXERCISE 1.1)

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Exercise: 1.1

Problem No: 40

Explain, without using a truth table, why $(p \vee \neg q) \wedge (q \vee \neg r) \wedge (r \vee \neg p)$ is true when p, q, and r have the same truth value and it is false otherwise.

Solution:

The proposition is true if each of the clause is true. Now $(p \vee \neg q)$ is false only if p is false and q is true. The clause $(q \vee \neg r)$ is false only if q is false, r is true. The clause $(r \vee \neg p)$ is false if r is false, p is true.

So, for having true value of the proposition We have to take truth value for each of p, q, r. Otherwise, the proposition is false.