Quiz-1 Math (20-9-2023-ERF) 60 minutes

Find solutions for the following problems. Chose 3 problems of 6, must contain A and B.

A1. Simplify the following formulas:

a. $p \wedge (p \wedge q)$

b. $\overline{\bar{p} \vee q}$

c. $\overline{p \Rightarrow \bar{q}}$

A2. Show that the argument

"If p and q, then r. Therefore, if not r, then not p or not q."

is valid. In other words, show that the logic used in the argument is correct.

A3. *Use the truth tables method to determine whether* $(\neg p \vee q) \wedge (q \rightarrow \neg r \wedge \neg p) \wedge (p \vee r)$ *(denoted with* φ*) is satisfiable.*

B1. In a school there are 25 teachers who teach engineering or management. Of these, 15 teach engineering and 6 teach both engineering and management. How many teach management?

B2. In a shop, 380 people buy socks, 150 people buy shoes and 200 people buy belt. If there are total 580 people who bought either socks or shoes or belt and only 30 people bought all the three things? So how many people bought exactly two things.

B3. There are 500 students in a school, 220 like science subject, 180 like math and 40 like both science and math. Find the number of students who like

- Science but not math
- Math but not science
- Either math or science