

Exercise No. 01:

p	q	$\neg p$	$\neg q$	$p \wedge q$	$p \vee q$	$p \Rightarrow q$	$p \Rightarrow \neg q$	$\neg p \wedge q$	$p \wedge \neg q$	$\neg p \wedge \neg q$	$\neg (p \wedge q)$
0	0	1	1	0	0	1	1	0	0	1	1
0	1	1	0	0	1	1	1	1	0	0	1
1	0	0	1	0	1	0	1	0	1	0	1
1	1	0	0	1	1	1	0	0	0	0	0

- Propose at least two sets of satisfiable formulas where each set consists of three formulas that not propositional variables.
- Let A be a propositional formula such that $\neg(p \wedge q)$ is a logical consequence of the formula A ($A \models \neg(p \wedge q)$). Using the previous truth table, find the different possible formulas of A.

Exercise No. 02:

Check the validity of the following logical consequences:

- $\{p, q \Rightarrow \neg p\} \models \neg q$
- $\{(p \wedge q) \Rightarrow \neg r, r\} \models \neg p$
- $\{p \Rightarrow (q \vee r), r \Rightarrow \neg p, q \Rightarrow r\} \models \neg p$
- $\{p \Leftrightarrow q; q\} \models p$

Exercise No. 03:

Formalize the following arguments and check if they are correct.

- If I am a computer scientist, I master programming. I am a computer scientist. So, I master programming.
- If I am a computer scientist, I master programming. I am not a computer scientist. So, I do not master programming.
- If he enrolls in second year computer science, he learns ASD3 and Logic. He does not learn ASD3. So, he does not enroll in second year computer science.

Exercise No. 04:

Using the resolution techniques, verify that:

- $\{\neg p \vee \neg q \vee r; \neg r; p; \neg t \vee q\} \vdash \neg t$
- $\{p \Leftrightarrow q; q\} \vdash p$
- $\{p \Rightarrow q; q \Rightarrow r\} \vdash p \Rightarrow r$
- $\{\neg p \vee q; \neg q \vee r; \neg r \vee s; \neg t \vee \neg s\} \vdash \neg s \vee \neg t$

Exercise No. 05:

- People who have coronavirus covid-19 should take the medicine M.
- People who have fever and dry cough have the covid-19 coronavirus.
- Those who have a temperature above 38° have a fever.
- Amine has a dry cough and a temperature of 39°.

We wonder if we should give Amine the medicine M.