Homework 5

Problem 1.

The following is an excerpt from a real clinical guideline. Please represent it as a SINGLE well-formed formula (WFF) in propositional logic.

Testing for diabetes should be considered for all individuals age 45 and older. Testing should be considered at a younger age, in individuals who:
- are obese
- have a first-degree relative with diabetes
- are members of a high-risk ethnic population (African American, Hispanic, Native American, Asian)
- are hypertensive
- have an HDL cholesterol level less than or equal to 40 mg/dl and/or a triglyceride level greater than or equal to 150 mg/dl

Problem 2.

If (A == true) {
    if (B == false) {
        C = true
    }
    else {
        C = false
    }
} else {
    C = false
}

Write a WFF in propositional logic to represent the logical relation between A, B and C. (HINT: you may use a truth table.)

Problem 3.

Use truth table to determine which of the following formulas are tautologies: (see attachment 1)

C: Congestive Heart Failure
F: Heart Failure
Problem 4. Flow chart is often used to represent clinical algorithms. Please complete the following flow chart based on this well-formed formula (WFF): (see attachment 2)

HR: High risk of lung cancer
Male: Being of the male gender
Smoker: having smoked for more than 5 years in their life
SF: lived with a smoker for more than 5 years in their life
FH: having a family history of lung cancer

* Please use each decision box to check only one variable. (as in attachment 3)