Test 1

1. Construct a truth table for $(p \vee (\neg r \rightarrow q))$.

2. Given the fragment of the truth table for expression F.

x1	x2	x3	x4	x5	x6	x7	F
1	1	0	1	1	1	1	0
1	0	1	0	1	1	0	0
0	1	0	1	1	0	0	1

Which of the statements listed below may be F?

a) ¬x1 ∧ x2 ∧ ¬x3 ∧ x4 ∧ x5 ∧ ¬x6 ∧ ¬x7
b) x1 ∧ ¬x2 ∧ x3 ∧ ¬x4 ∧ x5 ∧ x6 ∧ ¬x7
c) ¬x1 ∨ x2 ∨ ¬x3 ∨ x4 ∨ ¬x5 ∨ ¬x6 ∨ x7
d) x1 ∨ ¬x2 ∨ x3 ∨ ¬x4 ∨ ¬x5 ∨ x6 ∨ ¬x7

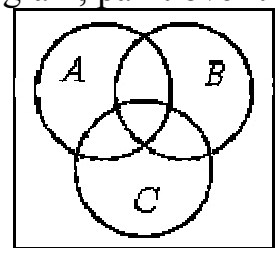
3. If $A = \{1, 2\}$, $B = \{x, y\}$, $C = \{\alpha, \beta, \gamma\}$ what is Cartesian product of sets

$$A \times B \times C?$$

4. Compute the composite of functions $g \bullet f \bullet h$ where
$f: \mathrm{R} \rightarrow \mathrm{R}, f(x) = x^3+2, g: \mathrm{R} \rightarrow \mathrm{R}, g(x) = 1/x$ and $h: \mathrm{R} \rightarrow \mathrm{R}, g(x) = 5x$.

5. The i-th term of a sequence is given by $a_i=(2i+3)/5$. Which term of the sequence is equal to 3?
   a) The third term
   b) The eighth term
   c) The sixth term
   d) The tenth term

6. Given the following Venn diagram, paint over the A U (B – C).



7. Find an estimation of the algorithm's complexity (in term big-O):

```
void f(;
{
for (int k = 0; k < m2_col; ++k)
        for (int i = 0; i < m1_row; ++i)
            for (int j = 0; j < m1_col; ++j)
                m3[i][k] += m1[i][j] * m2[j][k];

}
```

8. How many different solutions can the equation

$$J \wedge \neg K \wedge L \wedge \neg M \wedge (N \vee \neg N) = 0$$

have? J, K, L, M, and N are logical variables.