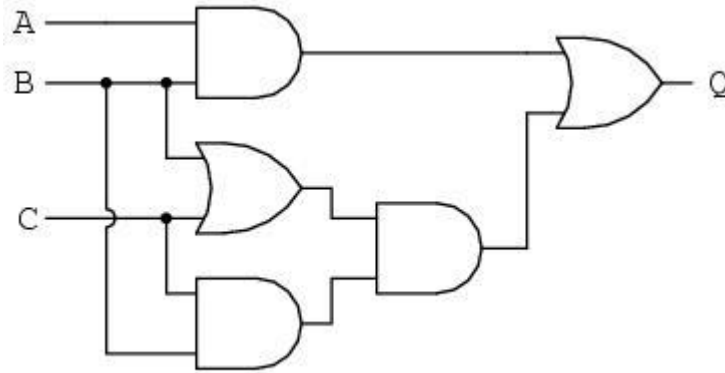


## Exercise on Digital Logic – Computing Intermediate

- 1) Evaluate the logical expression  $B(A' + C)$  when  $A=0$ ,  $B=1$  and  $C=0$ .
- 2) Write the operator precedence of the operators AND, OR and NOT.
- 3) Draw the logic circuit of the function  $F = (A + B')(A + C)'$ .
- 4) Write down the function of the following logic circuit:



- 5) Draw the truth table of the expression:  $A + (BC)'$
- 6) Prove the following identity  $ABC + AB'(A'+C)' \equiv A(C + B')$  by:
  - a) creating the truth tables of the left-hand-side and the right-hand-side
  - b) Boolean algebra
- 7) Both the NAND and NOR operations are functionally complete. Explain.
- 8)
  - a) Draw the logic gate of the XOR function.
  - b) What symbol is used for the XOR function?
  - c) Draw the truth table of the XNOR function.
  - d) Draw the logic gate of the XNOR function.
- 9) Draw the logic circuit, using only NAND gates, of the following Boolean expression:  $(A + B')C$ .
- 10) Draw the logic circuit, using only NOR gates, of the following Boolean expression:  $A'(B' + C)$ .
- 11) Draw the truth table of the XOR operation having three inputs.
- 12) Use Karnaugh maps to simplify the following expressions:
  - a)  $AB'C + A'BC + A'BC' + ABC'$
  - b)  $AB + AB'C + A'BC + A'BC'$
- 13) Give the truth table and draw the logic circuit of:
  - a) The half adder
  - b) The full adder