

### Expressions for Switches

When implementing expression using switches, it is helpful to have the expression in a form where only inputs are complemented. For each expression below, use DeMorgan's theorem to obtain an equivalent expression which contains ANDs and ORs of the inputs (e.g.,  $A$ ) and their complements (e.g.,  $\bar{A}$ ). There should be **no complements (bars)** in the final expression except those over the inputs.

**Part A** 
$$Out_1 = \overline{A(B + C) + (D \bar{E} F)}$$

$Out_1 =$

**Part B** 
$$Out_2 = \overline{\overline{(\bar{A} + B) + C} + (D + \overline{E + \bar{F}})}$$

$Out_2 =$