

**EXAM FOR TOPOLOGY**  
**WINTER SEMESTER 2025/2026**

QUESTIONS SET NO. 9

1. Give definition of a connected component of a topological space, and of connected topological spaces. Provide examples.
2. Do there exist two topological spaces  $X$  and  $Y$  with the following property: for any map  $f : X \rightarrow Y$ ,  $f$  is continuous if and only if  $f$  is open?