1. **Address Resolution Protocol**

   Answer the following questions regarding the Address Resolution Protocol (ARP) as used with IPv4:

   (a) What is the task of ARP?
   (b) How does the protocol work?
   (c) Are there security issues?

2. **Self-Configuration**

   (a) How can hosts self-configure their network layer address when using IPv4?
   (b) Name and discuss three protocols.

3. **Tracing**

   How can IPv4/IPv6 be used to trace the route between two hosts? Discuss different approaches and if they always work!

4. **Address Translation**

   Answer the following questions regarding Network Address Translation (NAT):

   (a) What is NAT and why is it necessary?
   (b) What types of NAT are available and what are their differences?
   (c) What problems can arise when using NAT?

5. **ICMP**

   Answer the following questions regarding the Internet Control Message Protocol (ICMP):

   (a) What services are provided by ICMP (not ICMPv6)?
   (b) Which of these services are superseded by other protocols or used very rarely?
   (c) What are the differences in ICMPv6?

6. **RIOT: Neighbor Discovery**

   Set up a scenario with at least 3 RIOT nodes that are connected over a broadcast link. Implement a (very) simple neighbor discovery protocol ontop of 6LoWPAN which enables multiple RIOT nodes to recognize and address each other.

   (a) Each node shall generate a random ID that is further used by all nodes to identify that specific node.
   (b) Send neighbor solicitations (NS) and neighbor advertisments (NA) to request and advertise the IDs.
   (c) Add duplicate address detection (DAD) to your implementation and resolve conflicts automatically.
   (d) Design spoofing attacks on your implementation. What are possible defence mechanisms?