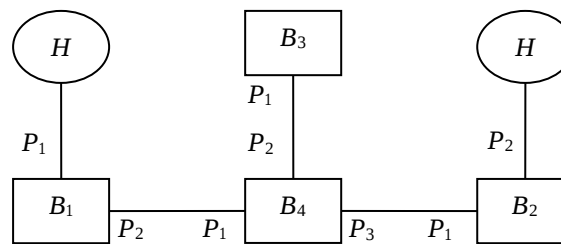




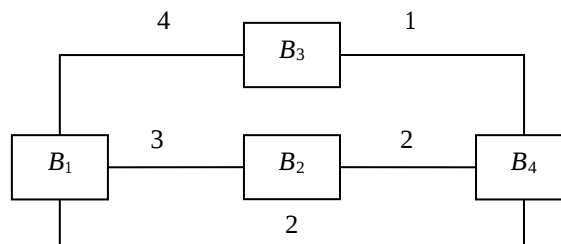
4. Multi-link multi-node networks: Problems

C1. The network below consists of four bridges – B_1 to B_4 , each of them having certain number of ports (the local names of the ports are P_1 , P_2 and so on). There are two units in the two ends of the network: H_1 and H_2 with MAC addresses M_1 and M_2 respectively. The bridges are transparent and build their forwarding (address) tables by learning. Assume that all forwarding tables are empty in the beginning. Unit H_1 sends a message to H_2 . Afterwards H_2 answers, by sending back a message to H_1 . The addresses in all messages are of a unicast type.

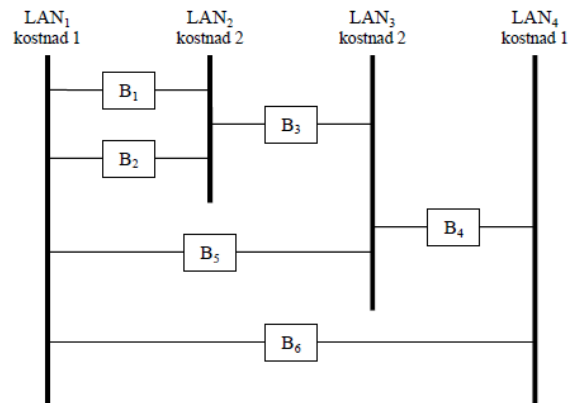


- State how the forwarding tables will look like in each bridge after the transmission of both messages.
- Assume that instead of bridge B_4 there is a hub (repeater). How would this change the contents of the forwarding tables in B_1 , B_2 and B_3 in comparison to the previous case?
- An advantage of the bridge in comparison to the hub is that the bridge can decrease the traffic in the network. Explain why.

C2. The figure below represents a network with four bridges (marked with B_1 to B_4). All links are bidirectional and have given cost. In order to prevent loops, the network adopts the “spanning tree” algorithm. Show how the tree would look like, if you calculate it with the help of “spanning tree”. When you calculate the tree, use the identification of the bridges and the cost of the links as criteria.



H1. The network, given below, consists of four LAN-segments (LAN1 to LAN4), which are connected with six switches ($B1$ to $B6$). The network contains loops; that is why you should use the Spanning Tree protocol to eliminate them. The cost of the LAN segments, as well as the identifiers of the switches (the indexes), is given. Use those as criteria for calculating the spanning tree and calculate and draw the resulting spanning tree.



H2. The network below consists of 5 bridges (B1 to B5); each bridge has its ports denoted with G1...G4. The network has also three hosts (H1 to H3) with MAC addresses respectively M1 to M3. Assume that the address tables of all bridges are empty in the beginning of the observation. Let first H1, and then H3 send a message to H2. After that H2 sends back a message towards H3. Show the address tables of all bridges in the end of the message exchange.

Would anything change in the forwarding tables if bridge B2 is substituted with a hub (repeater)?

