1. Spanning-Tree Protocol (STP) prevents loops from being formed when switches or bridges are interconnected via multiple paths. Switches exchange BPDU messages to detect loops, and then removes the loop by blocking the selected bridge interfaces. Bridge Protocol Data Units (BPDUs) are **frames that contain information about the spanning** tree protocol (STP). It guarantees that there is one and only one active path between two network devices.

   The MAC address and the priority together make up the switch ID. The switch with lowest ID is elected as a root. The process works as sated below.
      o   The node with the smallest ID is selected the root bridge
      o   On each bridge, select a root port
         ▪   Port with the least cost path to the root bridge
   o   On each LAN segment, select a designated bridge
      ▪   Bridge with least cost path to root bridge
         •   If two bridges have same cost, select the bridge with smallest ID
      ▪   Mark the corresponding port as the designated port
      o   Forward frames only on marked ports
         ▪   Designated ports and root ports
         ▪   Block on the others

Consider the given network topology with five L2 switches. Edit the switch priorities as per the given figure. For example, B1 will get priority 1 and B2 will get priority 2 and so on.

Create a custom application for source H2 to destination H4 with packet size 1000 bytes and inter-arrival time to 800 micro seconds. The start time parameter is set to 1 sec while configuring the application. Run the simulation for 10 sec.

   1. Identify the designated ports and blocked ports.
   2. Represent the spanning tree.
   3. List the switch table of every switch
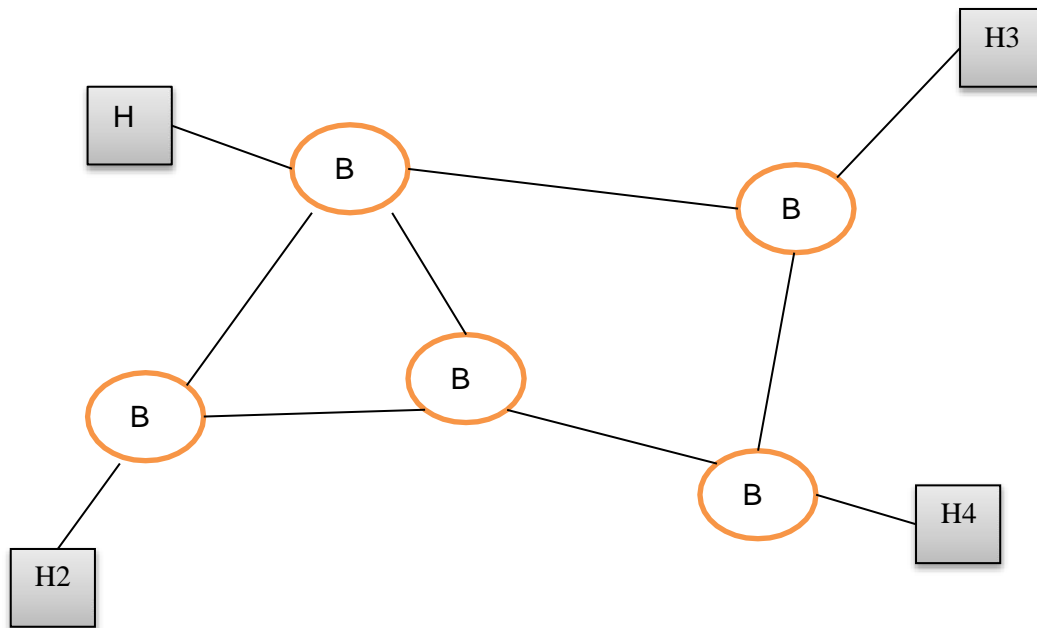
2) Design a network using a Layer-2 Switch where devices (Wired Nodes in NetSim) WN1, WN2 belong to VLAN1 and D3, D4 belong to VLAN2.

a. Create a broadcast application with D1 as the source. Document the frames received on both the VLANs.

b. Create a unicast application with D2 as the sender and D1 as the receiver. Document the frames received on both the VLANs.

c. Create a unicast application with D2 as the sender and D3 as the receiver. Document the frames received on both the VLANs.