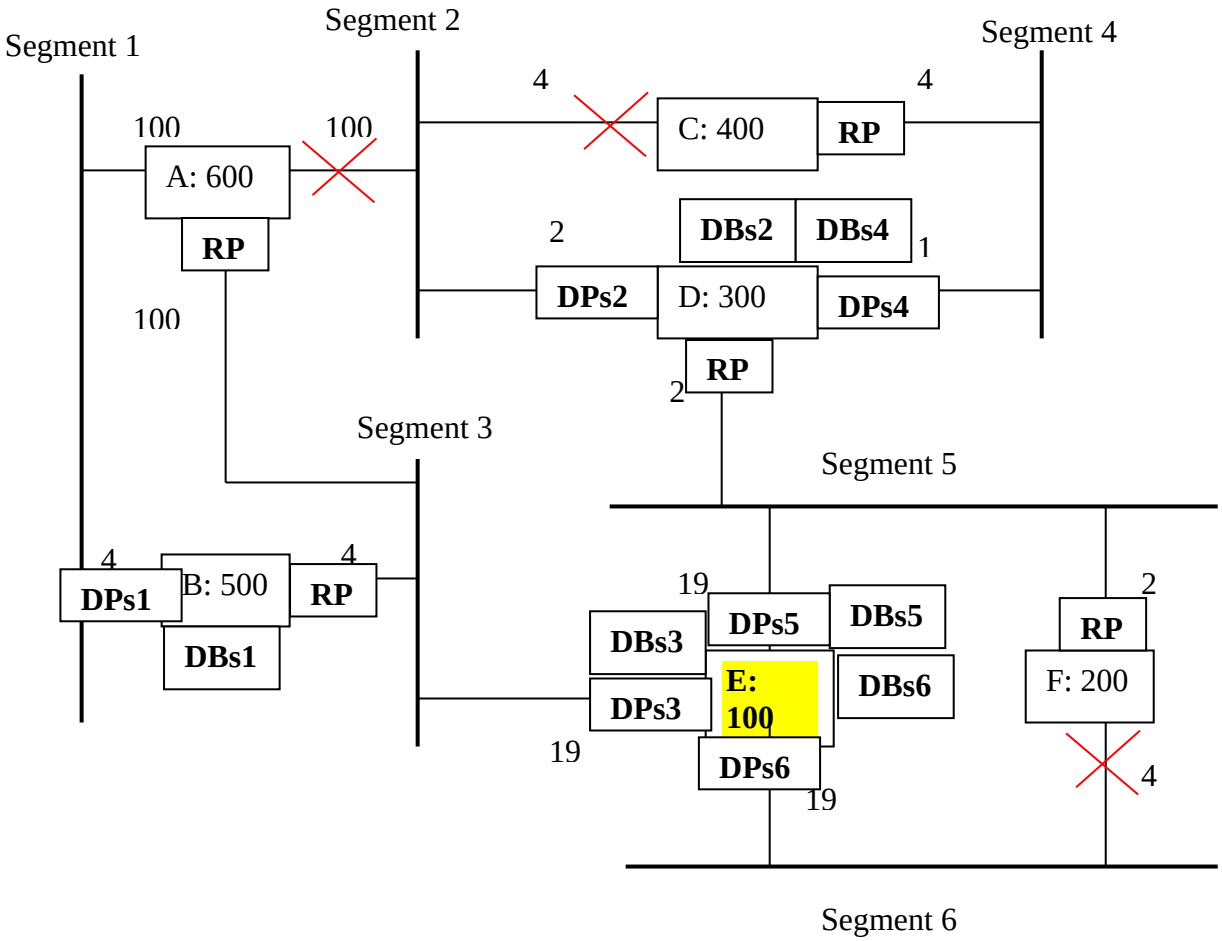
Computer Networks

Tutorial 10 – Sample Answers - STP

1. Bridge IDs of each bridge is given in the diagram.
   a) Highlight the Root Bridge :- The lowest BID - E
   b) Select the Root Port of every bridge :- The least distance to RB
   c) Select the designated Bridges and designated ports :-Least distance from a segment to the root
   d) Show the blocked ports.



2. Why do we need to have redundant links from one LAN segment to the other?

- Many companies and organizations increasingly rely on computer networks for their operations.
- Access to file servers, databases, the Internet, intranets and extranets is critical for successful businesses.
- If the network is down, productivity and customer satisfaction decline.
- To achieve such a goal ,extremely reliable networks are required.

- Reliability is increased by redundancy. A network that is based on switches or bridges will introduce redundant links between those switches or bridges to overcome the failure of a single link.

What sort of problems will be caused by the redundant links?

- Loops may occur in a network as part of a design strategy for redundancy.
- Ethernet frames have no TTL field
- After an Ethernet frame starts to loop, it will probably continue until someone shuts off one of the switches or breaks a link.
- Also due to this multiple frames can be transmitted.

3. How does the Spanning Tree Protocol select the Root Bridge?

All switches participating in STP exchange **BPDU** frames to determine which switch has the lowest bridge ID (BID) on the network. The switch with the lowest BID automatically becomes the root bridge for the STA calculations.

4. Find out what states can a bridge/switch port might be in Spanning Tree?

    - Blocking - ports can only receive BPDUs. Data frames are discarded and no addresses can be learned. It may take up to 20 seconds to change from this state.

    - Listening - Ports transition from the blocking state to the listening state. The listening period is called the forward delay and lasts for 15 seconds. In the listening state, data is not forwarded and MAC addresses are not learned. BPDUs are still processed.

    - Learning - Data is not forwarded, but MAC addresses are learned from traffic that is received. The learning state lasts for 15 seconds and is also called the forward delay. BPDUs are still processed.

    - Forwarding - User data is forwarded and MAC addresses continue to be learned. BPDUs are still processed.

    - Disabled - This disabled state can occur when an administrator shuts down the port or the port fails.