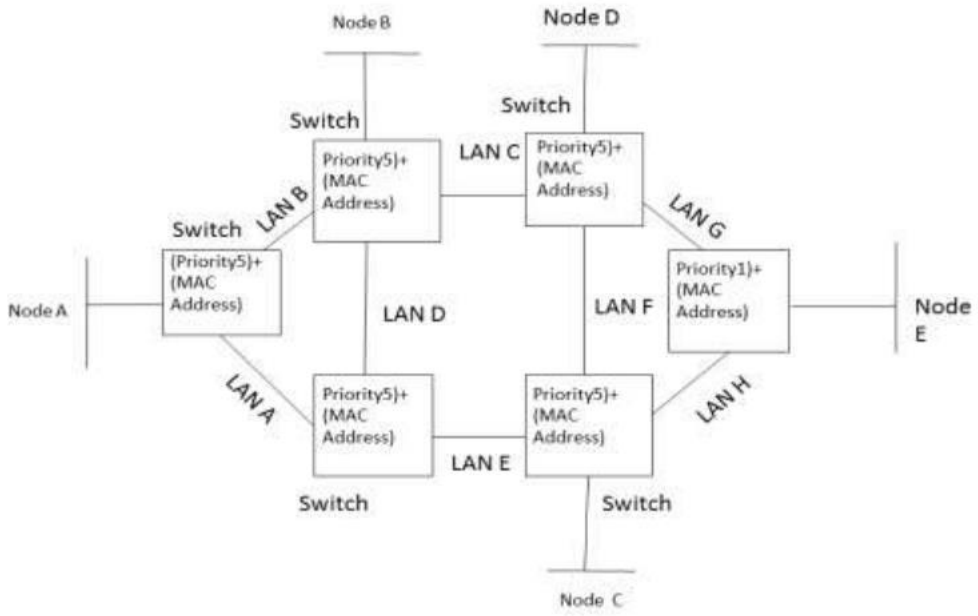
Task 3

Analyze and Compute the Spanning Tree for the extended LAN given below. For the following bridged LAN, assume that LANs 1, 3 and 5 are Gigabit Ethernets (Cost=4) and the rest are Fast Ethernets (Cost=19).Bridges are labelled with B1, B2, etc. Use the LAN costs to determine the least cost path.

- S1-S2
- S2-S3
- S3-S1



Assessment Rubrics

Category	Marks
Aim & Theory	5
Manual Calculation	10
Environment Creation & Block Diagram	20
Spanning Tree Results	10
Inference	5
Total	50

Aim:

To implement the spanning tree algorithm in the given topology and find the least cost paths and block ports.

Tools Required:

Net Sim Software

Theory:

Spanning tree Algorithm is a widely used algorithm to overcome the looping problem because of repeated cyclic updation of the forwarding table. This algorithm is mainly used in networks where some of its switches has a backup switch to ensure low down-time in routing. This algorithm basically finds the least cost path from a node to another node. It then block the other possible paths leading to high cost. So when packet transferring from one node to another, it only gets a path with low cost, hence overcoming the looping problem.

Tabulation of Port Address (Bridges)

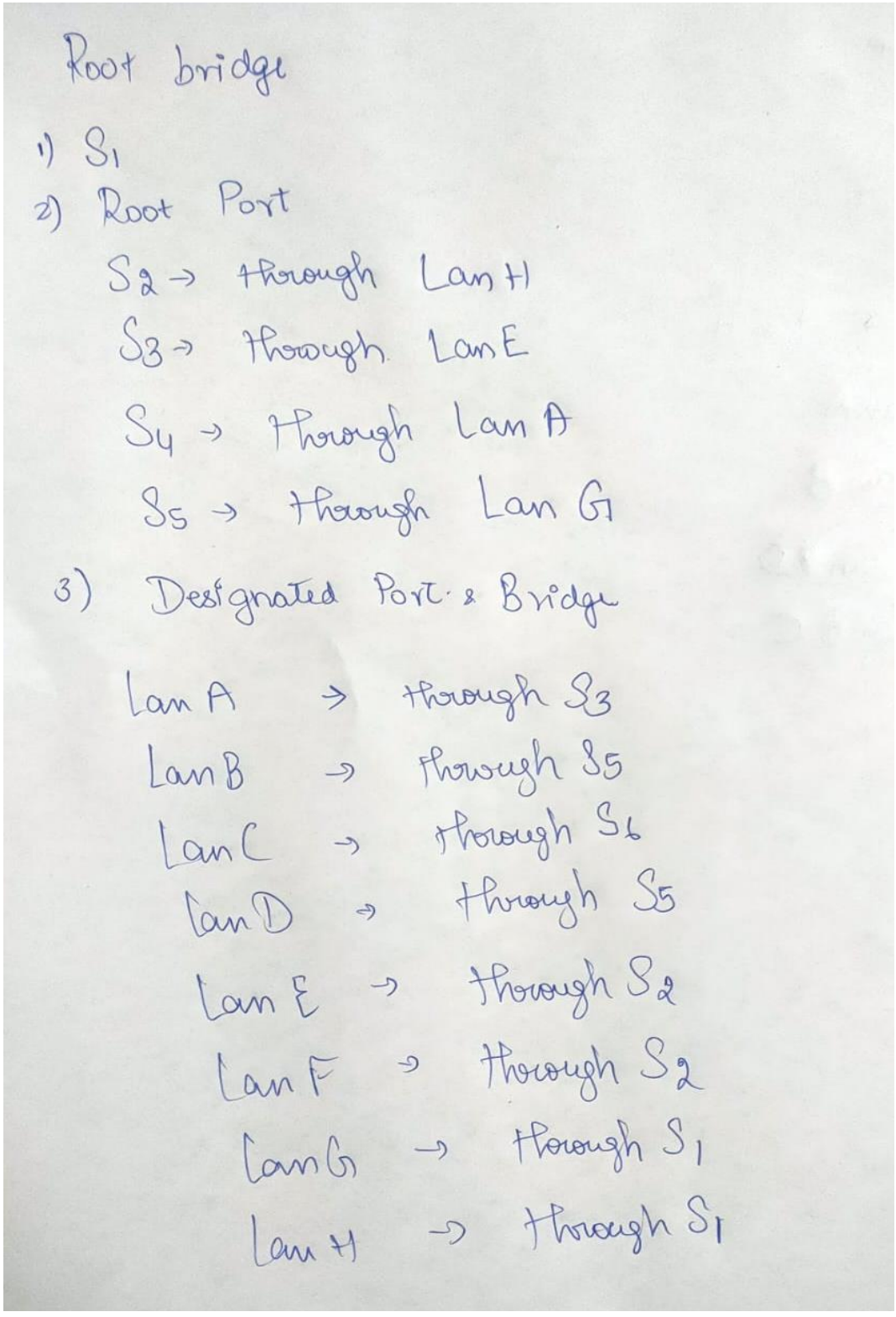
Bridge #	Port	Priority	MAC Address	Port ID (Priority + MAC)	Switch /Bridge ID (Lowest in Port ID)
S1 (NOT REQ)	LAN G	1	9954	19954	**18580**
	LAN H	1	8580	18580	
S2	LAN H	5	660F	5660F	**5424D**
	LAN E	5	9227	59227	
	LANF	5	424D	5424D	
S3	LAN E	5	184C	5184C	**50F8B**
	LAN A	5	0F8B	50F8B	
	LAN D	5	EE3C	5EE3C	
S4	LAN B	5	8BCA	58BCA	**58BCA**
	LAN A	5	F074	5F074	
S5	LAN B	5	86F6	586F6	**5A0BD**
	LAN C	5	FD34	5FD34	
	LAN D	5	A0BD	5A0BD	

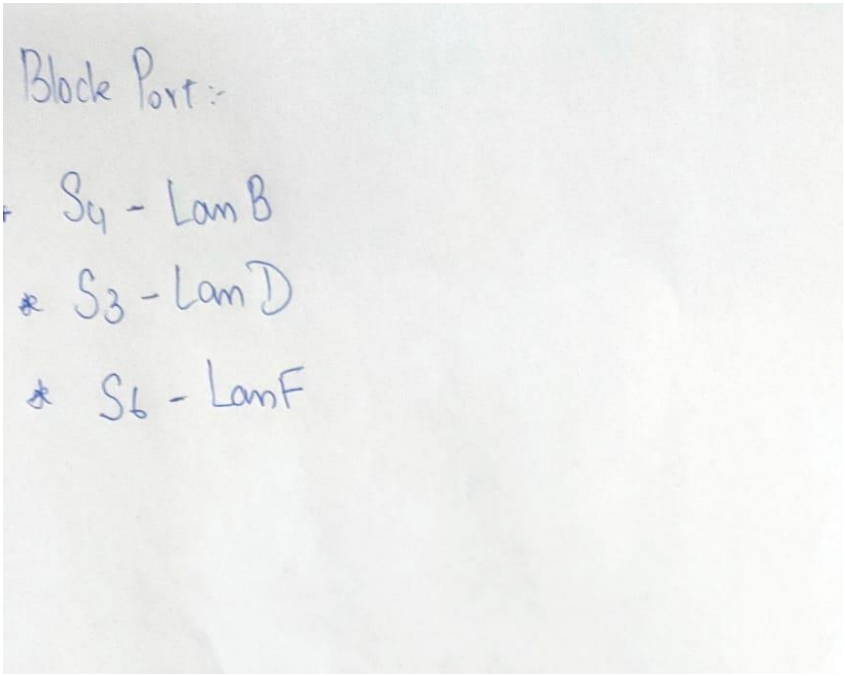
S6	LAN G	5	F45D	5F45D	**50EBA**
	LAN F	5	7B31	57B31	
	LAN C	5	0EBA	50EBA	

Tabulation of Port Address (LANs)

LAN #	Port #	Priority	MAC Address	Port ID (Priority + MAC)
LAN A	S4	7	4412	74412
	S3	7	2684	72684
LAN B	S4	7	1E15	71E15
	S5	7	8343	78343
LAN C	S5	7	D983	9D983
	S6	7	20B6	720B6
LAN D	S5	1	DD74	1DD74
	S3	1	F0D2	1F0D2
LAN E	S2	7	64E1	764E1
	S3	7	7E60	77E60
LAN F	S6	1	B304	1B304
	S2	1	5671	15671
LAN G	S6	7	056B	7056B
	S1	7	0727	70727
LAN H	S1	7	D5DF	7D5DF
	S2	7	4169	74169

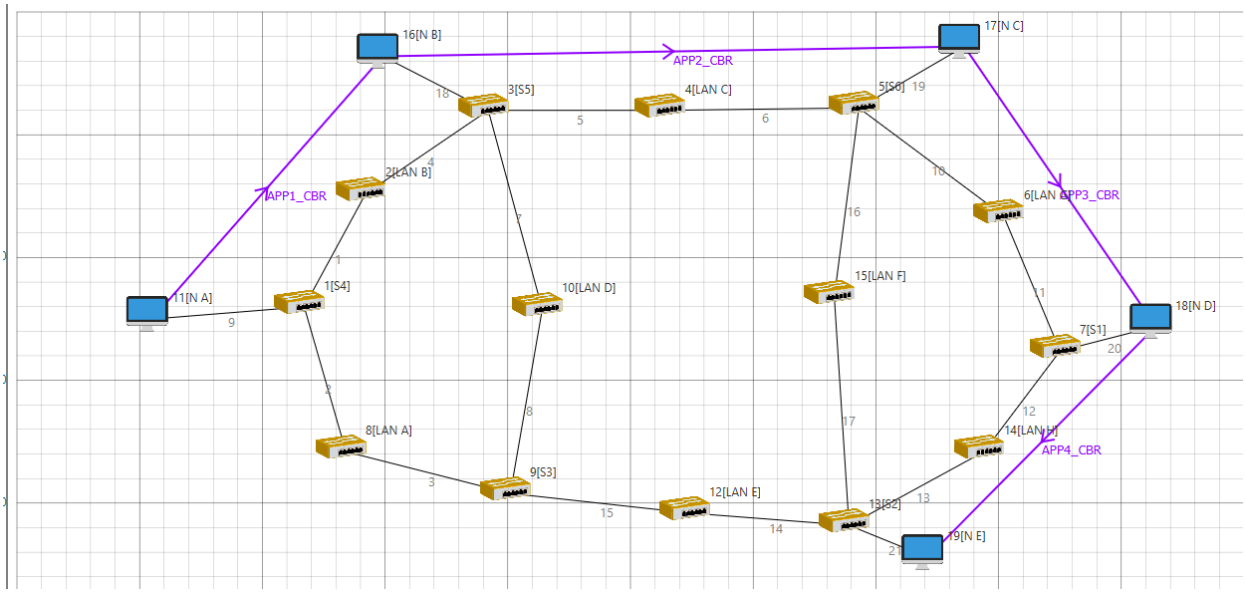
Manual Computation of Spanning Tree

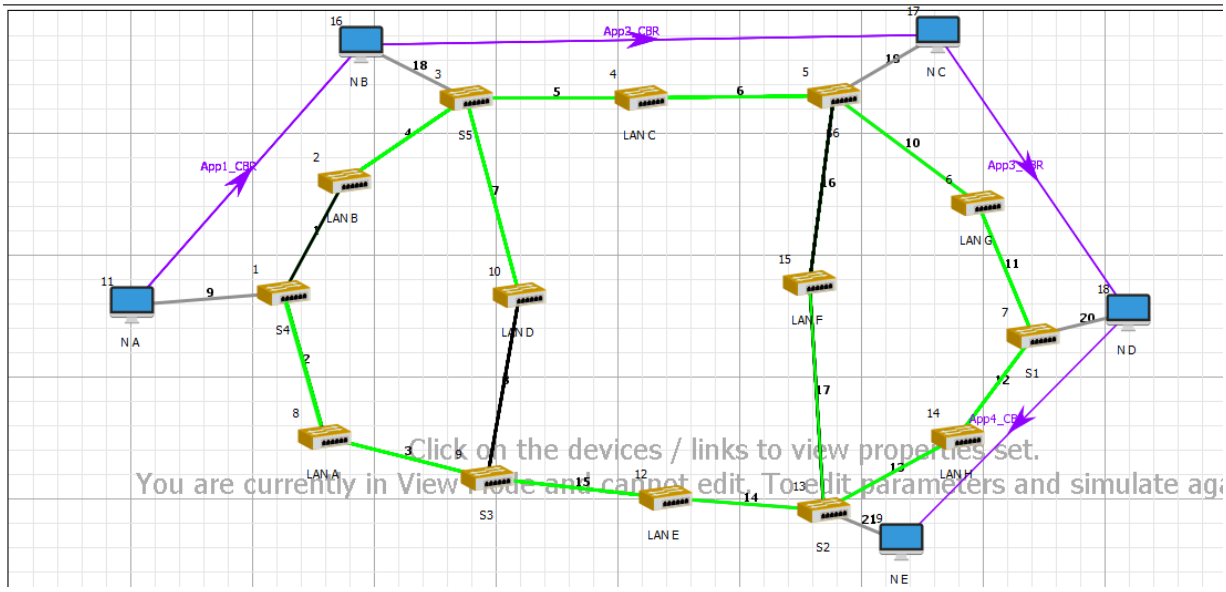




Spanning Tree Diagram

(Simulated Using NetSim)





Inference

Application Id	Application Name	Packet transmitted	Packet received	Throughput (Mbps)
1	APP1_CBR	499	499	0.582832
2	APP2_CBR	499	499	0.582832
3	APP3_CBR	499	499	0.582832
4	APP4_CBR	499	499	0.582832

We can clearly see from the above table that all the packets are received by the destination node, the looping problem is elimated with the use of spanning tree algorithm. They were some ports which are block to maintain the flow without looping. These blockings were made with the help of port id and the speed of LANs.