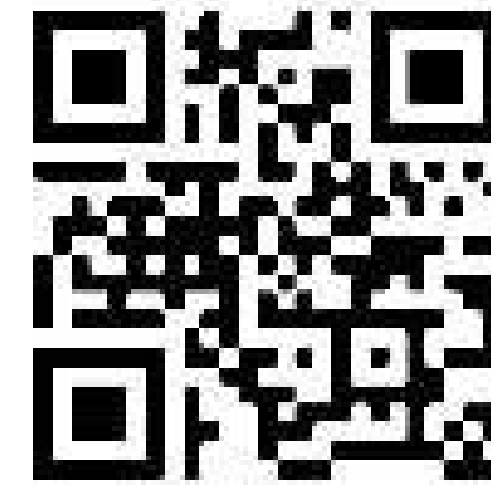




**Faculty Name: Prof.T.Velmurugan and Prof.S.Nandakumar**

**Answer all the questions**

Q1.	<p>Categorize and identify the network elements for the following types of networks as LAN, MAN, WAN, or interconnection of WAN:</p> <ol style="list-style-type: none"> <li>A company with its headquarters in London has to be connected to its branch office in India, France and North America.</li> <li>A club consisting of two workstations and one printer.</li> <li>A city traffic control system managed by a network of 700 computers</li> <li>A network used by commercial service providers such as Indian Airlines at multiple locations.</li> </ol>	4
Q2.	<p>Match the following to one or more layers of the OSI model:</p> <ol style="list-style-type: none"> <li>Route determination.</li> <li>Flow control.</li> <li>Interface to transmission media.</li> <li>Provides access for the end user.</li> <li>Service Port Address</li> </ol>	5
Q3.	<p>A CRC is constructed to generate a 4-bit FCS for 11-bit message polynomial is <math>x^4 + x^3 + 1</math>.</p> <ol style="list-style-type: none"> <li>Encode the data bit sequence 10011011100 (leftmost bit is the least significant) using the generator polynomial and generate the code word.</li> <li>Now assume that bit 5 (counting from the LSB) in the code word is in error and show that the detection algorithm detects the error.</li> </ol>	6
Q4.	<p>Consider that a half-duplex point to point link connects station A (transmitter) and B (receiver). The stations adopt stop and wait scheme for exchange of frames. Assume that the channel is error free and transmitter has a long message to be sent as a sequence of frames <math>f_1, f_2, \dots, f_n</math>. The processing time is relatively negligible and the ACK frame is very small compared to the information frame. Determine the maximum efficiency of the stop and wait scheme.</p>	5
Q5.	<p>File Transfer Protocol is an application layer protocol that uses the Stop-and-Wait protocol. To transfer a file from a server to a client, the server breaks the file into blocks of 512 bytes and sends these blocks to the client using Stop-and-Wait ARQ. Find the efficiency in transmitting a 1 MB file over a 10Mbps Ethernet LAN that has a diameter of 300 meters. Assume the transmissions are error-free and that each delay are negligible.</p>	5
Q6.	<p>Six stations (S1-S6) are connected to an extended LAN through transparent bridges (B1, B2 and B3), as shown in the Figure 1. Initially, the forwarding tables are empty. Suppose the following stations transmit frames: S1 transmits to S5, S3 transmits to S1, S4 transmits to S3, S5 transmits to S2, S2 transmits to S5 and S3 transmits to S2. Explain the steps involved in bridge learning and update the forwarding tables with appropriate entries after the frames have been completely transmitted</p>	5



SCAN ME

(HINT: Port 4 and Port 6 are blocked port)

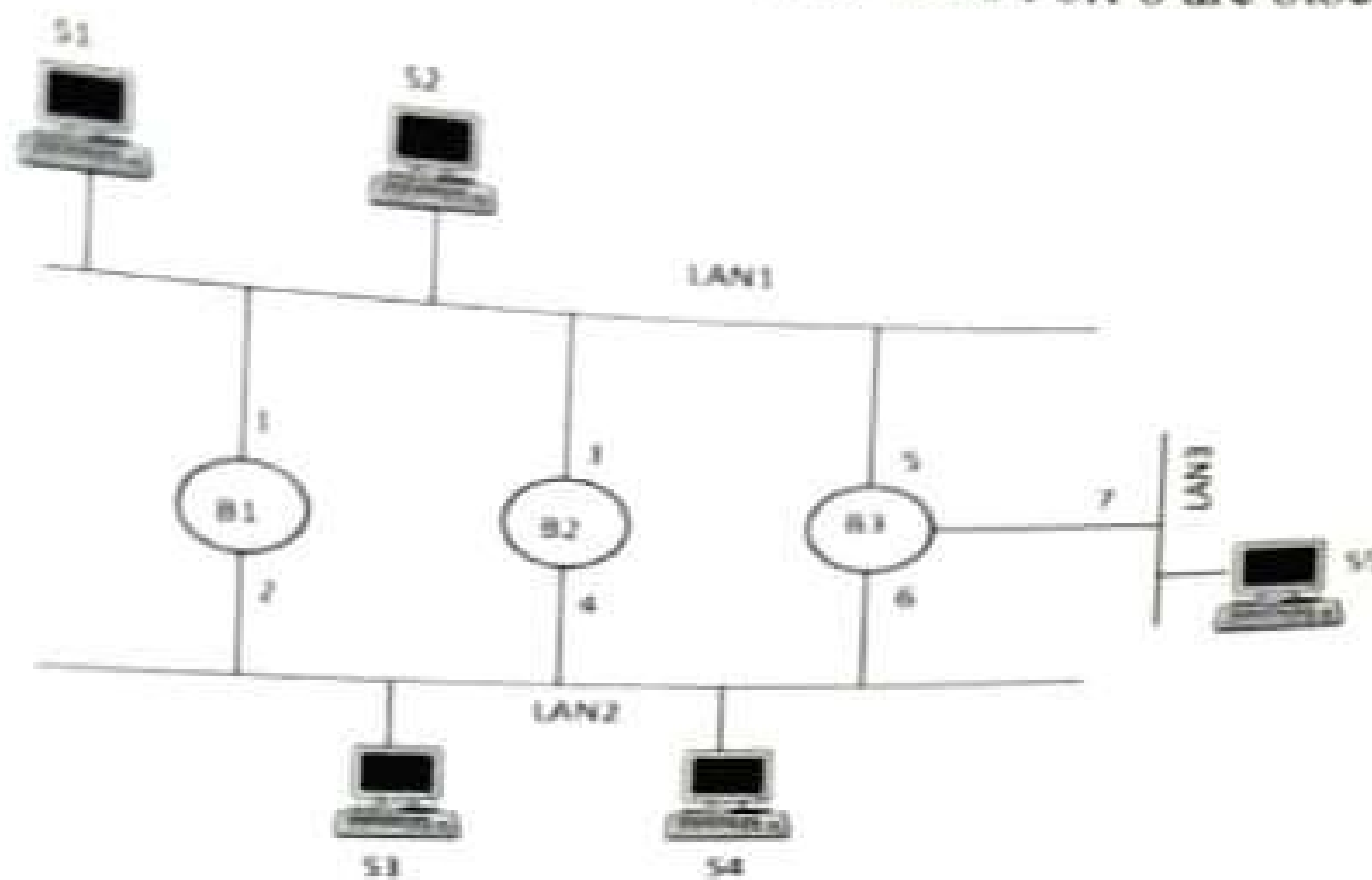


Figure 1

Q8.

i) Write the spanning tree algorithm and determine the spanning tree for the bridged LAN shown in Figure 2.

- Assume that LANs 1, 3 and 5 are Gigabit Ethernet (Cost= 4) and the rest are Fast Ethernet (Cost= 19).

NOTE 1: MAC address is represented in hexadecimal form.

- Numerical values 1, 2, 3, etc. indicate the port number of each Bridge.

ii) Consider Figure 2, Suppose S<sub>1</sub> wants to send a frame to S<sub>2</sub> but has not learned the route. Sketch the route followed by the single route and all route broadcast frames during route discovery.

