

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

CLASS: BE
BRANCH: ECE

SEMESTER: VI/ADD
SESSION : SP/2020

SUBJECT : EC6205 COMPUTER NETWORKING

TIME: 1.5 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

- Q1 (a) What is the significance of slot time in an Ethernet? How does it affect the maximum network length? For a 10 Mbps LAN with a maximum length of 2500 meters with four repeaters, the roundtrip propagation delay has been determined to be nearly 50 μ sec (including the time to pass through the repeaters). Calculate the minimum frame size (in bytes) assuming speed of light is 2×10^8 m/sec. [2]
- (b) Four stations A, B, C and D are connected in a ring architecture, which uses FDDI ring standard as MAC protocol, the following assumptions are true: [3]
- i) Traffic consists of fixed-length frames, ii) TTRT-120 frame times,
 - ii) Sync allocation for station A and C = 30 frame times for each station,
 - iii) Sync allocation for station B and D = 20 frame times for each station,
 - iv) The overhead for token circulation is 1 frame times (from A to B and C to D) while it is 2 frame times (from B to C and D to A).
- Assuming frames are sent from the first token circulation itself, show the table entries for 6 token circulations.

- Q2 (a) What are the three types of LLC services? Where are they used? [2]
- (b) Figure 1 shows an Internet configuration consisting of LAN's and bridges. Assuming bridges B1 and B2 are currently out of order and minimum hops as the criterion, (If there is a tie, give preference to bridge with lower identifier i.e. B5 is preferred to B6 and so on). Form the central routing matrix (by taking source LAN's in the column form and destination LAN's in the row form) and routing tables for bridges B6, B10 and B15. [3]

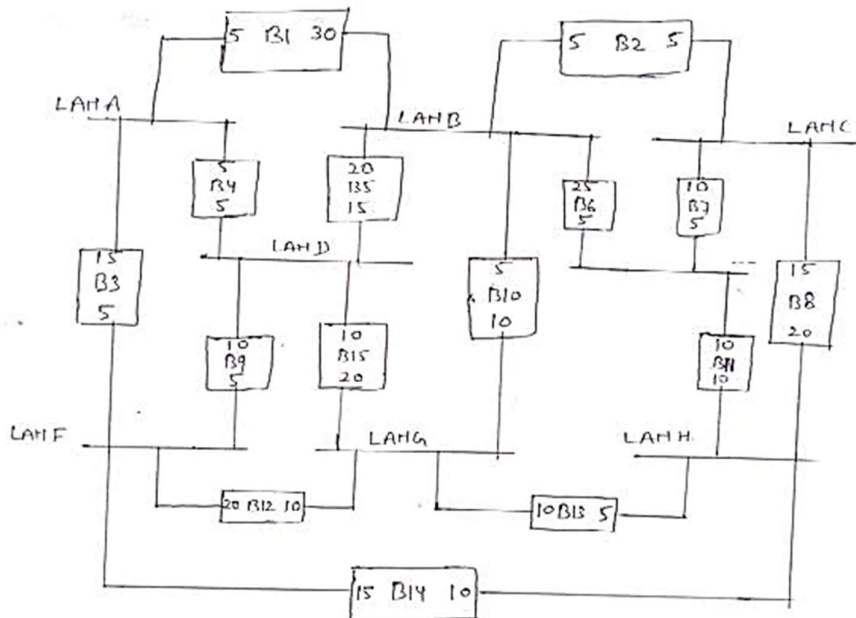


Figure-1

- Q3 (a) Discuss the three types of mobility defined in IEEE 802.11 Wireless LAN. How is the concept of an association related to that of mobility in an IEEE 802.11 wireless LAN? [2]
- (b) Figure 1 shows an internet configuration, where costs are marked on the bridges. Assuming all the bridges are in working condition, form the spanning tree with B10 as the destination root bridge and mark all route ports, designated bridges and designated ports. [3]

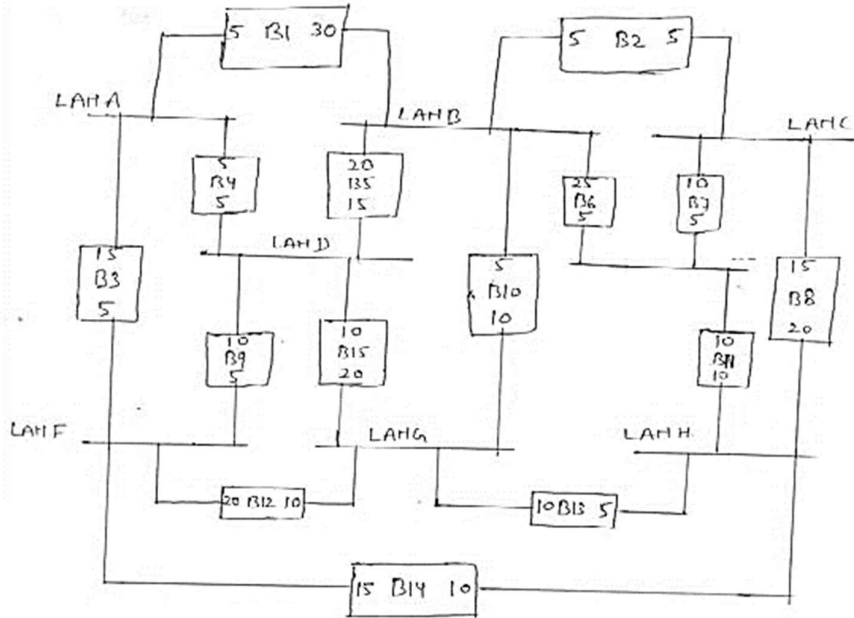


Figure-1

- Q4 (a) What do you understand by Backbone Network? Differentiate between BUS and STAR Backbone Networks. [2]
- (b) What are the performance-related issues with layer 2 switches? How are they overcome by layer 3 switches? Explain the two different types of layer 3 switches. [3]
- Q5 (a) Segment an original datagram of 1600 octets into 4 segments of 384, 320, 560, and 336 octets by indicating the data length, offset, and status of MORE flag for each segment. [2]
- (b) How does IPv6 header help in speeding up the routing process as compared to IPv4 header? Compare IPv4 and IPv6 headers in tabular form (Header formats need not to be drawn). [3]
- Q6 (a) Find out the Network ID, Broadcast Address, first and last valid IP on the sub-network that the host 192.168.1.15 belongs to, if the given subnet mask is 255.255.255.192? [2]
- (b) Suppose 1MByte of application data (including application layer header) has to be sent out of a host attached to Ethernet. Assume the application uses TCP protocol and that the IP as well as TCP header is 20 bytes each. Further assume that Ethernet MTU size is 1500 and TCP uses segments of size 1480. Find out the following: [3]
- How many datagrams are sent out of the host?
 - What is the size (in bytes) of the last datagram?