

21. Given the maximum lifetime of a segment is 30 sec and the link capacity is 500Mbps, find the no. of bits required to avoid wrap-around during this time.

- (A) 10 bits
- (B) 23 bits
- (C) 30 bits
- (D) 34 bits

22. A 40 Mbps broadcast network that controls medium access using polling has 20 hosts, and the time required for polling the next host is 80 μ sec. Whenever a node is polled, it is allowed to transmit 4000 bytes. Find the efficiency of the broadcast channel

- (A) 100/9
- (B) 100/11
- (C) 80/7
- (D) 10/11

23. Suppose 'A' and 'B' are on the same 10Mbps Ethernet segment, and the propagation delay between two nodes is 275-bit times. Suppose A and B are on two ends of the wire and try to send a frame at time $t=0$, and frames collide. Then, at what time (in bits) they finish transmitting a jam signal? Assume a 48-bit jam signal.

- (a) 598
- (b) 323
- (c) 502
- (d) 227

24. A 3000 km long trunk operates at 1.536 Mbps and is used to transmit 64-byte frames. If it uses sliding window protocol, then what are the number required sequence numbers? Assume a propagation speed of 8 microsec/ km.

- (a) 63
- (b) 110
- (c) 123
- (d) 145

25. What is the number of sequence bits used in the above question (Number of bits used for sequence number)?

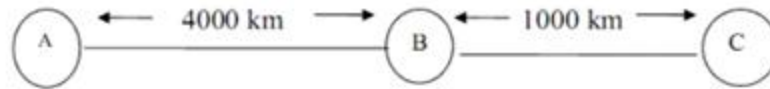
26. If 'K' is the maximum number of bits available in the sequence number field, then what is the maximum sender window size in GBN?

- (a) $2^K - 1$
- (b) 2^{K-1}
- (c) 2^K
- (d) 2^{K+1}

27. If the Bandwidth of an Ethernet is 100Mbps, the distance of the LAN is 1Km, and the velocity of the signal in the cable is 2×10^8 m/sec. Then what is the minimum size of a frame in this Ethernet to detect collisions?

- (a) 10,000 bits
- (b) 1000 bits
- (c) 100 bits
- (d) 1000 bytes

28. Consider the following figure. The data rate between A and B is 100 kbps. The propagation speed is 5μsec/km for both lines. Frames are generated at node A and sent to node C through node B and each frame is 1000 bits long. Between A and B, a sliding window protocol is used, with a window size of 3. Between B and C, stop and wait is used. Determine the minimum transmission rate required between nodes B and C so that the buffers at node B are not flooded. (ACK frames are of negligible length)



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| A. 100Kbps | B. 125Kbps |
| C. 150Kbps | D. 175Kbps |

29. If the Packet size is 2 KB and the propagation delay is 16 ms, the channel capacity is 10^6 bps. The utilization of sender for STOP and WAIT (in percentage) is _____.

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| A. 33.33 | B. 30.03 | C. 43.33 | D. 23.33 |
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30. A channel has a bit rate of 10 Kbps using stop and wait protocol with 80% efficiency. What will be the propagation delay for a frame of 400 bits?

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| A. 2ms | B. 5ms | C. 7ms | D. 10ms |
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