

1. Consider a 40 Kbps satellite link has a propagation delay of 504 ms. The transmitter employs the “go back n ARQ” scheme with n set to 15. Assuming that each frame is 105 bytes long, the maximum data rate possible is \_\_\_\_\_ (in kbps). (Upto 2 decimal places)

a. 12.24    b. 12.42    c. 24.12    d. 42.12    **Correct Option: a.**

2. Which of the following application layer protocol uses UDP as a transport layer protocol?

a. FTP    b. DNS    c. SMTP    d. HTTP    **Correct Option: b.**

3. Which of the following statements is true?

- a. The size of TCP receiver window never changes throughout the duration of connection.
- b. Suppose host A is sending a large file to host B over a TCP connection. The number of unacknowledged bytes that host A send cannot exceeds the size of advertised receiver buffer.
- c. Both a and b are true
- d. Neither a nor b is true

**Correct Option: b.**

4. Consider the following statements:

S1 : TCP is message oriented protocol while UDP is stream oriented.

S2 : TCP guarantees that No-out-of-order segment is delivered to the process.

S3 : In congestion avoidance algorithm, the size of congestion window increases exponentially until it reaches a threshold.

Which of the statements are NOT true?

- a. Only S3    b. Only S2 and S3    c. Only S1 and S3    d. Only S1 and S2

**Correct Option: c.**

5. Consider the following statements:

S1: DNS can use either of TCP or UDP, for its query and response messages.

S2: SMTP is not used for transferring e-mail messages from the recipients's mail server to the recipients's personal computer.

S3: HTTP can use multiple TCP connections between the same client and the server.

S4: POP protocol is used to download an E-mail from mailbox server to a mail client.

Which of the above statements are correct?

- a. Only S3 and S4      b. Only S1, S2 and S4      c. Only S1, S2, S3  
d. Only S2, S3, S4

**Correct Option: d.**

6. Consider the following statements with respect to application layer:

S1 : Datagram is the PDU (Protocol data unit) used.

S2 : There is a fixed limit on the maximum size of data that it can pass on the TCP layer.

Which of the following options is correct?

- a. Only S1 is true      b. Only S2 is true      c. Both S1 and S2 are true  
d. Neither of S1 and S2 is true

**Correct Option: d.**

7. Which of the following protocols is used to monitor network devices such as hubs, switches and routers?

- a. OSPF      b. RIP      c. SMTP      d. SNMP

**Correct Option: d.**

8. Suppose that the stop-and-wait protocol is used on a link with a bit rate of  $32 \times 10^6$  bps and  $11 \mu\text{sec}$  propagation delay. Assume that the transmission time for the acknowledgment and the processing time at nodes are negligible. To achieve a link utilization of 50%, the minimum frame size required is \_\_\_\_\_ bytes.

- a. 88      b. 98      c. 352      d. 118

**Correct Option: a.**

9. A network with bandwidth of 10 Mbps can pass only an average of 12,000 frames per minute with each frame carrying an average of 10,000 bits. What is the throughput of this network?

- a. 1,000,000 bps   b. 2,000,000 bps   c. 12,000,000 bps   d.  
1,200,000,000 bps

**Correct Option: b.**

10. The length of UDP Header's Port Number and TCP Header's Sequence Number in bits are \_\_\_\_\_ and \_\_\_\_\_ respectively.  
a. 16 and 32                      b. 32 and 16                      c. 16 and 16  
d. 32 and 32

**Correct Option: a.**

11. If a TCP connection is transferring a file of 5000 bytes. The first byte is numbered 1001. What are the sequence numbers for each segment if data is sent in five segments, each carrying 1000 bytes?

- a. 1000, 2000, 3000, 4000, 5000  
b. 1001, 2001, 3001, 4001, 5001  
c. 1001, 2000, 3000, 4000, 5001  
d. 5001, 6001, 7001, 8001, 9001

Ans: (B)

12. What is the main protocol in the transport layer?

- a. TCP  
b. UDP  
c. FTP  
d. Both (a) and (b)

Ans: (D)

13. Number of bytes for header in UDP segment and TCP segments are

- a. 8 bytes, 20 bytes  
b. 16 bytes, 16 bytes

- c. 4 bytes, 20 bytes
- d. None of these

Ans: (A)

14. What are the main functions of application layer

- a. Mail service provide a basis for electronic mails forwarding and storage
- b. File access transfer and management
- c. Creates virtual terminal that allows us to log onto remote host
- d. All of the above

Ans: (D)

15. TCP uses multiple times to do its work, the times are

- a. Retransmission timer
- b. Persistence timer
- c. Keep alive timer
- d. All of the above

Ans: (D)

16. If 4-bit are used to represent sequence numbers for flow control. What are sender and receiver window size in Go-back-N?

- a. 16, 1
- b. 15, 1
- c. 8, 8
- d. 15, 2

Ans: (B)

17. If 4-bit are used to represent sequence numbers for flow control. What are sender and receiver window size in selective repeat?

- a. 16, 1
- b. 8, 8
- c. 4, 4
- d. 4, 1

Ans: (B)

18. Which of the following transport layer protocols is used to support electronic mail?

- a. SMTP
- b. IP
- c. TCP
- d. UDP

Ans: (C)

19. What is the value of the receiver window (rwnd) for host A if the receiver, host B has a buffer size of 5000 bytes and 1000 bytes of received and unprocessed data?

- a. 5000
- b. 4000
- c. 1000
- d. None of the above

Ans: (B)

20. What is the minimum size of the process data that can be encapsulated in UDP datagram?

- a. 0 byte
- b. 8 bytes
- c. 16 bytes
- d. 32 bytes

Ans: (A)

21. A client uses UDP to send data to a server. The data size is 16 bytes. Calculate the efficiency of this transmission at UDP level (ratio of useful bytes to total bytes).

- a. 0.54
- b. 0.67
- c. 0.60

d. 0.70

Ans: (B)

22. To make the initial sequence number a random number, most system start the counter at 1 during bootstrap and increment the counter by 64,000 every 0.5 second. How long does it take for the counter to wrap around?

- a. 33,554 sec
- b. 30,554 sec
- c. 31,554 sec
- d. 40,000 sec

Ans: (A)

23. TCP is sending data at 1Mbyte/sec. If the sequence number starts with 7000, how long does it take before the sequence number goes back to zero?

- a. 4295 sec
- b. 4290 sec
- c. 5000 sec
- d. 4000 sec

Ans: (A)

24. In one of the pairs of protocols given below, both the protocols can use multiple TCP connections between the same client and server. Which one is that?

- a. HTTP, FTP
- b. HTTP, TELNET
- c. FTP, SMTP
- d. HTTP, SMTP

Ans: (A)

25. Application layer offers ..... service.

- a. End-to-end
- b. Process-to-process
- c. Both

d. None

Ans: (A)

26. The default connection type used by HTTP is .....

- a. Persistent
- b. Non-persistent
- c. Can be either persistent or non-persistent depending on connection request
- d. None of the mentioned

Ans: (A)

Common data for questions 27 - 30:

The following is a dump of a UDP header in hexadecimal format

0632 000D 001C E217

27. What is the source port number?

- a. 32
- b. 1586
- c. 632
- d. 63

Ans: (B)

28. What is the destination port number?

- a. 10
- b. 12
- c. 13
- d. 0

Ans: (C)

29. What is the total length of the user datagram?

- a. 8 bytes
- b. 20 bytes
- c. 28 bytes
- d. 64 bytes

Ans: (C)

30. What is the length of data?

- a. 8 bytes
- b. 28 bytes
- c. 16 bytes
- d. 20 bytes

Ans: (D)