NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

Computer Network and Internet Protocol

(Jan-Apr 2024)

Assignment- Week 5

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Consider the following statements.
(i) UDP is a wrapper of the IP layer.
(ii) TCP is suitable for short message transfer where reliability is not a concern.
Which of the above statement(s) is/are correct?

a) Only i
b) Only ii
c) Both i and ii
d) None of the above

Correct Answer: (a)
Explanation: UDP is a wrapper of the IP layer. UDP is suitable for short message transfer where reliability is not a concern. In contrast, reliability is a major concern in TCP.

QUESTION 2:

When the *select()* system call returns zero?

a) An error was encountered
b) Call timed out without any event ready for the sockets monitored
c) Zero is the number of sockets that have events pending (read, write, exception)
d) OS kills the process.

Correct Answer: (b)
Explanation: When select() returns zero, it indicates that the call timed out without any event ready for the sockets being monitored.

QUESTION 3:

When you create a socket as s = socket(domain, type, protocol), why do you set the value of the protocol parameter as zero?

a) The system selects the default protocol number for the domain and socket type requested.
b) No protocol needed
c) Since a computer understands binary so that it can be either 0 or 1
d) None of the above

Correct Answer: (a)

Explanation: Setting the protocol parameter to zero is a way of indicating that you want the system to choose the default protocol for the specified socket type and address family. This is often suitable for most common use cases, where the default protocol is the one expected for the given socket type and address family (e.g., TCP for SOCK_STREAM and IPv4).

QUESTION 4:

SOCK STREAM represents

a) UDP-based Datagram Socket
b) TCP-based Stream Socket
c) QUIC-based Stream Socket
d) None of the above

Correct Answer: (b)
Explanation: SOCK STREAM represents TCP-based Stream socket.

QUESTION 5:

Socket Address is:

a) IPv4 Address Translated to Ipv6 Address
b) Combination of IP Address and Port Address
c) Combination of MAC Address and domain Address
d) Application Layer Address

Correct Answer: (b)
Explanation: Socket is a combination of IP and Port address.

QUESTION 6:

(i) UDP does not have any flow control and congestion control mechanism.
(ii) UDP is suitable for purposes where error checking and correction is less important than timely delivery.
Which of the above statement(s) is/are true?

a) Only i
b) Only ii
c) Both i and ii
d) None the above

Correct Answer: (c)
Explanation: UDP does not have any flow control and congestion control mechanism. UDP is suitable for purposes where error checking and correction is less important than timely delivery.

QUESTION 7:

Packet integrity can be checked by the checksum mechanism.

a) True
b) False

Correct Answer: (a)
Explanation: Packet integrity can be checked by the checksum mechanism.

QUESTION 8:

Consider the following statements regarding the slow start phase of the TCP congestion control algorithm. Note that CWND stands for the TCP congestion window. The CWND increases linearly after every round trip time till threshold.

a) True
b) False

Correct Answer: (b)
Explanation: Each time an ACK is received by the sender, the congestion window is increased by 1 segment: CWND=CWND+1. Thus, CWND increases exponentially on every RTT.

QUESTION 9:

Consider a TCP connection in a state where there are no outstanding ACKs. The sender sends two segments back to back. The sequence numbers of the first and second segments are 230 and 290 respectively. The first segment was lost but the second segment was received correctly by the receiver.
Let X be the amount of data carried in the first segment (in bytes) and Y be the ACK number sent by the receiver. The values of X and Y are:

a) 60 and 290
b) 230 and 291
c) 60 and 231
d) 60 and 230

Correct Answer: (d)
Explanation: Sequence number of 1st segment = 230
Sequence number of 2nd segment = 290
From here, the range of sequence numbers contained in the 1st segment = [230,289].
Total number of sequence numbers contained in the 1st segment = 289 – 230 + 1 = 60.
TCP assigns one sequence number to each byte of data.
Thus, Amount of data contained in the first segment = 60 bytes.
On receiving the 2nd segment,
Receiver sends the acknowledgement asking for the first segment only.
This is because it expects the 1st segment first.
Receiver keeps sending this ACK number until it receives the first segment correctly.
Thus, Acknowledgement number = Sequence number of the 1st segment = 230.
So, option (d) is correct.

QUESTION 10:

In TCP congestion control mechanism is triggered once

a) 1 Duplicate ACK(DUPACK) is received
b) After a Retransmission Timeout(RTO)
c) 3 Duplicate ACK(DUPACK) is received
d) No Duplicate ACK(DUPACK) is received

Correct Answer: (b) and (c)
Explanation: TCP congestion control mechanism is triggered in two situations, when retransmission timeout and 3 duplicate ACK is received.