UCLM
UNIVERSIDAD DE CASTILLA-LA MANCHA

Computer Networks II

Test 1 (extra)

Escuela Superior de Informática

calificación

This exam consists of 13 question totalling 20 points. The maximum duration is 40 minutes. Three wrong answers substract a point. Only an answer if correct if otherwise not stated. Calculator use is forbidden. Write legibly using only the reserved area.

Apellidos: SOLUCIÓN Nombre: _____ Grupo: _____

1. (1p) Which of the following code fragments is the most similar to a basic web client?

```
// a)
s = socket()
s.connect(('1.2.3.4', 2000))
s.send('GET / HTTP/1.0\n\n')
s.recv(32)
```

```
// b)
s = socket(AF_INET, SOCK_STREAM)
s.sendto('GET /index.html HTTP/1.0\n\n', ('www.example.net', 80))
s.recvfrom(32)
```

```
// c)
s = socket(AF_INET, SOCK_DGRAM)
s.listen(10)
s.connect('http://www.google.com')
s.recvfrom('GET /index.html HTTP/1.0\n\n', 80)
```

```
// d)
s = socket(AF_INET, SOCK_RAW)
s.sento('GET /index.html HTTP/1.0\n\n', ('eth0', 80))
```

- [x] **a)** .
- [ ] **b)** .
- [ ] **c)** .
- [ ] **d)** .

2. (1p) What is the purpose of the `accept` system call?

- [ ] **a)** Bind a local port with a process.
- [x] **b)** Block waiting for a new incoming connection.
- [ ] **c)** Try to establish a new connection.
- [ ] **d)** Receive a new segment by the designated port.

3. (1p) What happens when a UDP client invokes `sendto()` to an incorrect address?

- [ ] **a)** The connection ends in error.
- [ ] **b)** A `ServerNotFound` exception is raised.
- [ ] **c)** Request forwarding.
- [x] **d)** Nothing.

4. (1p) The receiving window size...

- [x] **a)** may grown and shrink.
- [ ] **b)** keeps the same value since the connection.
- [ ] **c)** is set by the sender.
- [ ] **d)** is set for both by the server.

5. (1p) When does TCP calculate the value of the retransmission timer?

- [ ] **a)** The timeout is set according to RFC 793.
- [x] **b)** It changes during connection.
- [ ] **c)** When the connection is established.
- [ ] **d)** When the server starts.

6. (1p) The typical MSS value on TCP is 1460 Bytes. Why?

- [ ] **a)** Because it is the initial value set by the OS.
- [ ] **b)** Because it is the closest power of 2 to 1420.
- [x] **c)** Because Ethernet has an MTU of 1500 Bytes.
- [ ] **d)** Because it is defined at the RFC 793.

7. (1p) TCP avoids sending too small segments because it is very inefficient, but sometimes necessary. How is it achieved?

- [ ] **a)** Using a small buffer when invoking `send()`.
- [ ] **b)** Choosing a small MTU local network technology.
- [ ] **c)** Setting a high port number on the server.
- [x] **d)** Disabling Nagle for that connection.

8. (1p) TCP assumes the existence of congestion due to the need for retransmissions and the appearance of duplicate ACKs. This assumption is reasonable because, in the presence of congestion ...

   ☐ **a)** The network load measurement is high.
   ☐ **b)** The packet count is high.
   ■ **c)** Routers discard packets.
   ☐ **d)** The measured RTT is high.

9. (1p) In what kind of networks can *backpressure* be used to eliminate congestion?

   ☐ **a)** In datagram networks.
   ■ **b)** In virtual circuit networks.
   ☐ **c)** In both of them.
   ☐ **d)** None.

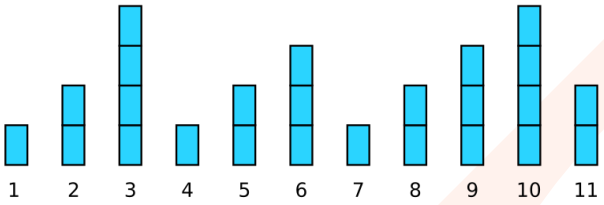
10. (1p) Given an HTTP message, what is the largest size?

    ☐ **a)** The segment payload.
    ☐ **b)** The package payload.
    ■ **c)** The frame payload.
    ☐ **d)** All is the same, because it is the same message.

11. (1p) What characterizes a connectionless service?

    ■ **a)** The sender does not verify that the recipient is there before transmitting.
    ☐ **b)** Communication begins after a negotiation process between source and destination.
    ☐ **c)** Usually the reliable protocols offer it.
    ☐ **d)** TCP offer that service.

12. (4p) The picture below shows the value of the congestion window (in segments) for a TCP connection. Explain the reason of the changes in each moment and indicate the ssthresh value.



13. (5p) The following figure shows a TCP flow, including connection and disconnection. Given:
    - It is not using Slow Start.
    - The retransmission timer for A segments A is set to 5 clock ticks.
    - The retransmission timer for A segments A is set to 3 clock ticks.
    - Both use a fixed segment size of 100 bytes.
    - Both will send segments with data whenever possible.

Put the relevant data for the segments represented by empty boxes.