

*This test has 18 questions for a total of 30 points. Every three wrong test answers 1 point will be subtracted. Only one option is correct. Calculators are not allowed.*

Apellidos: \_\_\_\_\_ **SOLUCIÓN** \_\_\_\_\_ Nombre: \_\_\_\_\_ Grupo: \_\_\_\_\_

1. (1p) The physical address of an interface is related to the \_\_\_\_\_ layer.  
☐ a) Physical  
☐ b) Network  
☒ c) Data link  
☐ d) Internet
2. (1p) Which assertion from the following ones about the network layer is false?  
☐ a) It provides connectivity between hosts once their IPs are known  
☐ b) It uses the routers when hosts are on a different network  
☐ c) It uses the IP protocol  
☒ d) It requires information about the port numbers of the processes involved in the communication
3. (1p) In a \_\_\_\_\_, more than two devices can share the same link  
☐ a) point-to-point  
☒ b) multipoint  
☐ c) primary  
☐ d) secondary
4. (1p) A \_\_\_\_\_ is a collection of many separate networks  
☐ a) WAN  
☒ b) internet  
☐ c) LAN  
☐ d) ninguna de las anteriores
5. (1p) Which of the following assertions about physical and logical addresses is true?  
☐ a) The physical address of a network interface changes when the node is connected to a different local area network  
☒ b) It's possible to send and receive information in a LAN without the assignment of a logical address  
☐ c) It's possible to send and receive information in a LAN without the assignment of a physical address  
☐ d) none of the above
6. (1p) What's characteristic about a connectionless service?  
☒ a) Messages are sent without any previous configuration.  
☐ b) The client can't send data during connection establishment.  
☐ c) Any protocol based in the TCP/IP stack is.  
☐ d) It can't provide any kind of reliability.
7. (1p) In the client-server model  
☐ a) The client process is initiated at the moment communication takes place  
☐ b) It's not required a previous connection establishment with the server in order to transfer data to it  
☐ c) The client can not only send but also receive data  
☒ d) All the above are true

8. (1p) The UDP transport protocol is the preferred option ...
- ☐ a) In those cases where a large bandwidth is required
  - ☒ b) In those cases where the response time should be kept minimum
  - ☐ c) In instant messaging applications
  - ☐ d) In file transference applications
9. (1p) The URL defines the following:
- ☐ a) address:port://host/DNSname
  - ☐ b) host://domain/path
  - ☒ c) protocol://host:port/path
  - ☐ d) none of them
10. (1p) An \_\_\_\_\_ document is created by the web server whenever a browser performs the request
- ☐ a) static
  - ☐ b) active
  - ☒ c) dynamic
  - ☐ d) none of the above
11. (1p) In HTTP when we refer to the status line we're talking about ...
- ☐ a) The content of the header of the response message
  - ☐ b) The content of the header of the request message, that includes data relative to the host, browser, etc.
  - ☒ c) The first line of the response message
  - ☐ d) none of the above
12. (1p) Cookies are generated by \_\_\_\_\_ and stored in the \_\_\_\_\_.
- ☐ a) client; client
  - ☐ b) client; server
  - ☒ c) server; client
  - ☐ d) server; server
13. (1p) When the sender and the receiver of an email are on the same system, we need only ...
- ☐ a) one UA (User Agent)
  - ☐ b) two UAs
  - ☒ c) one UA and one MTA (Mail/Message Transfer Agent)
  - ☐ d) none of the above
14. (1p) Which of the following assertions about SMTP is false?
- ☒ a) It's the protocol used between the destination user agent and the email server
  - ☐ b) It's the protocol used between the origin user agent and the email server
  - ☐ c) It's the protocol used between origin and destination email servers
  - ☐ d) None of the assertions is true
15. (1p) Which of the following assertions about DNS is true?
- ☐ a) All nameservers contain all data of all names used in the Internet
  - ☐ b) There's only one root DNS server in the Internet
  - ☒ c) The server stores registries with the IP addresses assigned to each host name, but it also includes the mail servers or the DNS servers associated to a domain
  - ☐ d) None of the above

16. (10p) The following listing shows the result of some network traffic captured in Wireshark. Using this information answer the following questions

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1  Frame 6: 71 bytes on wire (568 bits), 71 bytes captured (568 bits) on interface 0
2  Ethernet II, Src: RivetNet_de:ba:ad (9c:b6:d0:de:ba:ad), Dst: Cisco_3a:c9:40 (00:64:40:3a:c9:40)
3  Internet Protocol Version 4, Src: 161.67.48.198, Dst: 172.20.32.3
4  User Datagram Protocol, Src Port: 47460, Dst Port: 53
5  Domain Name System (query)
6    [Response In: 7]
7    Transaction ID: 0xba56
8    Flags: 0x0100 Standard query
9    Questions: 1
10   Answer RRs: 0
11   Authority RRs: 0
12   Additional RRs: 0
13   Queries
14
15
16  Frame 7: 87 bytes on wire (696 bits), 87 bytes captured (696 bits) on interface 0
17  Ethernet II, Src: Cisco_3a:c9:40 (00:64:40:3a:c9:40), Dst: RivetNet_de:ba:ad (9c:b6:d0:de:ba:ad)
18  Internet Protocol Version 4, Src: 172.20.32.3, Dst: 161.67.48.198
19  User Datagram Protocol, Src Port: 53, Dst Port: 47460
20  Domain Name System (response)
21    [Request In: 6]
22    [Time: 0.006594410 seconds]
23    Transaction ID: 0xba56
24    Flags: 0x8580 Standard query response, No error
25    Questions: 1
26    Answer RRs: 1
27    Authority RRs: 0
28    Additional RRs: 0
29    Queries
30    Answers
31      www.uclm.es: type A, class IN, addr 161.67.137.16
  
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- a) List ALL protocols in the captures: Ethernet; IP; UDP; DNS
  - b) IP address of the web server: 161.67.137.16
  - c) IP address of the name server: 172.20.32.3
  - d) IP address of the client: 161.67.48.198
  - e) Physical address of the client, if it's possible to know: 9c:b6:d0:de:ba:ad
  - f) Physical address of the name server, if it's possible to know: It can't be known. It's in a different network
  - g) Who does port 47460 belong to? (client, web server, DNS server) To the client
  - h) Which type of port is the one in the previous question? It's an ephemeral or dynamic port, assigned by the O.S. to the client for the transaction, and returned to the former once finished
  - g) Who does port 53 belong to? (client, web server, DNS server) To the DNS server
  - h) Which type of port is the one in the previous question? It's a well known port, typically used for the DNS
17. (2p) Describe in short how it's possible to attach binary data to an e-mail, despite the e-mail protocols are all text-based
- One of the limitations of the use of e-mail for the transference of data is that it was only conceived for the use of text, and more concretely 7-bit ASCII code. That prevents not only the use of many characters used in other languages but english, but also sending binary data.
- The purpose of the MIME extensions (Multipurpose Internet Mail Extensions) is therefore being able to transmit any kind of digital information, not just text. This is achieved through the codification of binary information into a sequence of ASCII characters, so the result can be sent as text information to the destination. Once in the final mailbox, the user agent will pick the message, identify the coded part using MIME, decode it and regenerate the original binary information (image, text document, ...).
- The inclusion of the MIME content into the e-mail message is done through the use of a header including several sections, such as the type of content include (GIF image, for example), the coding mechanism, the name of the original file, ...



18. (3p) Show graphically the components of an HTTP message, including the headers of all protocols until the data link layer, and displaying how each one is encapsulated into the next one. Also include the most relevant information for each header (IPs, MACs, ports, ....)

