

Advanced Computer Networks

QUIZ -I

NAME: Parul ShandilyaID.NO.: 16UCS126

01. Which layer is right below the Application layer?

- ☒ (a) Transport
- (b) Internetworking
- (c) Link Layer
- (d) Obtuse layer

(a)

02. What kind of document is used to describe widely used Application layer protocols?

- (a) DHCP
- ☒ (b) RFC
- (c) APPDOC
- (d) ISO 9000

(b)

03. Which of these is an idea that was invented in the Application layer?

- (a) 0f:2a:b3:1f:b3:1a
- (b) 192.168.3.14
- (c) www.khanacademy.com
- ☒ (d) http://www.dr-chuck.com/

(d)

04. Which of the following is *not* something that the Application layer worries about?

- (a) Whether the client or server starts talking first
- (b) The format of the commands and responses exchanged across a socket
- ☒ (c) How the window size changes as data is sent across a socket
- (d) How data is represented as it is sent across the network to assure interoperability.

(c)

05. Which of these is an Application layer protocol? FTP

- ☒ (a) HTTP
- (b) TCP x
- (c) DHCP
- (d) Ethernet

(a)

06. What port would typically be used to talk to a web server?

- (a) 23
- ☒ (b) 80
- (c) 103
- (d) 143

(b)

07. What is the command that a web browser sends to a web server to retrieve a web document?

- (a) RETR
- (b) DOCUMENT
- (c) 404
- ☒ (d) GET

(d)

08. What is the purpose of the "Content-type:" header when you retrieve a document over the web protocol?

- ☒ (a) Tells the browser how to display the retrieved document
- (b) Tells the browser where to go if the document cannot be found
- (c) Tells the browser whether or not the retrieved document is empty
- (d) Tells the browser where the headers end and the content starts

(a)

Advanced Computer Networks

QUIZ -I

09. What common UNIX command can be used to send simple commands to a web server?

- (a) ftp
- (b) ping
- (c) traceroute
- (d) telnet

(d)

10. What does an HTTP status code of "404" mean?

- (a) Document has moved
- (b) Successful document retrieval
- (c) Protocol error
- (d) Document not found

(d)

11. What characters are used to mark up HTML documents?

- (a) Less-than and greater-than signs < >
- (b) Exclamation points !
- (c) Square brackets []
- (d) Curly brackets { }

(a)

12. What is a common application protocol for retrieving mail?

- (a) RFC
- (b) HTML
- (c) ICANN
- (d) IMAP

(d)

13. What application protocol does RFC15 describe?

- (a) telnet
- (b) ping
- (c) traceroute
- (d) www

(a)

14. What happens to a server application that is sending a large file when the TCP layer has sent enough data to fill the window size and has not yet received an acknowledgement?

- (a) The application switches its transmission to a new socket
- (b) The application crashes and must be restarted
- (c) The application is paused until the remote computer acknowledges that it has received some of the data
- (d) The closest gateway router starts to discard packets that would exceed the window size

(c)

15. What is a "socket" on the Internet?

- (a) A way for devices to get wireless power
- (b) A way for devices to get an IP address
- (c) An entry in a routing table
- (d) A two-way data connection between a pair of client and server applications

(d)

16. What must an application know to make a socket connection in software?

- (a) The address of the server and the port number on the server
- (b) The route between the source and destination computers
- (c) Which part of the IP address is the network number
- (d) The initial size of the TCP window during transmission

(a)

Advanced Computer Networks

Parul Shandilya
16UCS126

QUIZ - I

17. Suppose a client sends an HTTP request message with the *If-modified-since* header. Suppose the object in the server has not changed since the last time that client retrieved the object. Then the server will send a response message with the status code:
- (a) 304 Not Modified (a)
 - (b) 404 Not Found
 - (c) 200 OK
 - (d) 403 Permission Denied
18. Which of the following is used to contain an Internet standard?
- (a) RFC (a)
 - (b) IETF
 - (c) DNS
 - (d) PPP
19. HTTP request and response messages are not humanly readable
- (a) True
 - (b) False (b)
 - (c) Both
 - (d) None of the above
20. All SMTP e-mail messages must be in 8-bit ASCII
- (a) True (b)
 - (b) False
 - (c) Both
 - (d) None of the above
21. Which of the following protocols uses out-of-band signalling?
- (a) HTTP (c)
 - (b) SMTP
 - (c) FTP
 - (d) All of the above
22. What does the Domain Name System accomplish?
- (a) It allows network-connected computers to use a textual name for a computer and look up its IP address (a)
 - (b) It keeps track of the GPS coordinates of all servers
 - (c) It allows Regional Internet Registries (RIRs) to manage IP addresses on the various continents
 - (d) It assigns different IP addresses to portable computers as they move from one WiFi to another
23. What organization assigns top-level domains like ".com", ".org", and ".club"?
- (a) IANA - Internet Assigned Numbers Authority (c)
 - (b) IETF - Internet Engineering Task Force
 - (c) ICANN - International Corporation for Assigned Network Names
 - (d) IMAP - Internet Mapping Authorization Protocol
24. Which of these is a domain address?
- (a) 0f:2a:b3:1f:b3:1a
 - (b) 192.168.3.14
 - (c) www.khanacademy.org (c)
 - (d) @drchuck

Advanced Computer Networks

QUIZ -I

25. Which of these is *not* something a domain owner can do with their domain?

- (a) Create subdomains
- (b) Sell subdomains
- (c) Create new top-level domains
- (d) Assign an IP address to the domain or subdomain

26. The sender's window size is 10 packets. At what approximate rate (in packets per second) will the protocol deliver a multi-gigabyte file from the sender to the receiver? Assume that there is no other traffic in the network and packets can only be lost because the queues overflow.

- (a) Between 900 and 1000.
- (b) Between 450 and 500.
- (c) Between 225 and 250.
- (d) Depends on the timeout value used

27. Identify the correct sequence in which the following packets are transmitted on the network by a host when a browser requests a webpage from a remote server, assuming that the host has just been restarted.

- (a) HTTP GET request, DNS query, TCP SYN
- (b) DNS query, HTTP GET request, TCP SYN
- (c) DNS query, TCP SYN, HTTP GET request
- (d) TCP SYN, DNS query, HTTP GET request

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

- (a) HTTP, FTP
- (b) HTTP, TELNET
- (c) FTP, SMTP
- (d) HTTP, SMTP

29. A graphical HTML browser resident at a network client machine Q accesses a static HTML webpage from a HTTP server S.

The static HTML page has exactly one static embedded image which is also at S.

Assuming no caching, which one of the following is correct about the HTML webpage loading (including the embedded image)?

(a) Q needs to send at least 2 HTTP requests to S, each necessarily in a separate TCP connection to server S

(b) Q needs to send at least 2 HTTP requests to S, but a single TCP connection to server S is sufficient

(c) A single HTTP request from Q to S is sufficient, and a single TCP connection between Q and S is necessary for this

(d) A single HTTP request from Q to S is sufficient, and this is possible without any TCP connection between Q and S

30. In the following pairs of OSI protocol layer/sub-layer and its functionality, the INCORRECT pair is

- (a) Network layer and Routing
- (b) Data Link Layer and Bit synchronization
- (c) Transport layer and End-to-end process communication

Advanced Computer Networks

QUIZ -I

(d) Medium Access Control sub-layer and Channel sharing

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

- (a) SMTP
- (b) IP
- (c) TCP
- (d) UDP

(a)

32. Consider different activities related to email.

m1: Send an email from a mail client to a mail server

m2: Download an email from mailbox server to a mail client

m3: Checking email in a web browser

Which is the application level protocol used in each activity?

- (a) m1: HTTP m2: SMTP m3: POP
- (b) m1: SMTP m2: FTP m3: HTTP
- (c) m1: SMTP m2: POP m3: HTTP
- (d) m1: POP m2: SMTP m3: IMAP

(c)

33. Which one of the following uses UDP as the transport protocol?

- (a) HTTP
- (b) Telnet
- (c) DNS
- (d) SMTP

(c)

34. Match the following

Field	Length in bits
P. UDP Header's Port Number	I. 48
Q. Ethernet MAC Address	II. 8
R. IPv6 Next Header	III. 32
S. TCP Header's Sequence Number	IV. 16
(a) P-III, Q-IV, R-II, S-I	
(b) P-II, Q-I, R-IV, S-III	
(c) P-IV, Q-I, R-II, S-III	
(d) P-IV, Q-I, R-III, S-II	

(b)

35. Consider a long-lived TCP session with an end-to-end bandwidth of 1 Gbps ($= 10^9$ bits-per-second). The session starts with a sequence number of 1234. The minimum time (in seconds, rounded to the closest integer) before this sequence number can be used again is 34 sec

2^{32} unique sequence.

36. The maximum size of data that the application layer can pass on to the TCP layer is any size

37. A sender uses the Stop-and-Wait ARQ protocol for reliable transmission of frames. Frames are of size 1000 bytes and the transmission rate at the sender is 80 Kbps (1Kbps = 1000 bits/second). Size of an acknowledgement is 100 bytes and the transmission rate at the receiver is 8 Kbps. The one-way propagation delay is 100 milliseconds.

Assuming no frame is lost, the sender throughput is 2500 bytes/second.

$$(100 \times 8) / 80 \times 1000 = 0.1 \text{ sec.}$$

$$1000 / 0.4 = 2500 \text{ bytes/sec.}$$

S. No. 6504

Jaipur

Parul Shandilya

16UCS12G.

Advanced Computer Networks

QUIZ -I

38. A network has a data transmission bandwidth of 20×10^6 bits per second. The maximum signal propagation time from one node to another node is 40 microseconds. The minimum size of a segment in the network is 200 bytes. $(2 \times 4 \times 10^{-1} \times 2 \times 10^7) / 8$

39. Suppose that the stop-and-wait protocol is used on a link with a bit rate of 64 kilobits per second and 20 milliseconds propagation delay. Assume that the transmission time for the acknowledgement and the processing time at nodes are negligible. Then the minimum frame size in bytes to achieve a link utilization of at least 50% is 320.

40. A link has a transmission speed of 10^6 bits/sec. It uses data packets of size 1000 bytes each. Assume that the acknowledgement has negligible transmission delay, and that its propagation delay is the same as the data propagation delay. Also assume that the processing delays at nodes are negligible. The efficiency of the stop-and-wait protocol in this setup is exactly 25%. The value of the one-way propagation delay (in milliseconds) is 12.

41. The protocol data unit (PDU) for the application layer in the Internet stack is segment.

42. If you want to browse a page <http://www.nytimes.com>, DNS application layer protocol besides HTTP is needed?

43. The time required to send a bit from the beginning of the link to the end of a link is called the frame transmission time.

44. An application-layer process sends messages into, and receives messages from, the network through a software interface called a socket.

45. SMTP has numerous wonderful qualities, as evidenced by its ubiquity in the Internet, it is nevertheless a legacy technology that possesses certain archaic characteristics. For example, it restricts the body (not just the headers) of all mail messages to simple 7-bit ASCII.

46. In a DNS server, a resource record is a four-tuple that contains the following fields: (Name, Value, Type, TTL).

47-50: In the following 2 problems, we are sending a 50 Mbit MP3 file from a source host to a destination host. All links in the path between source and destination have a transmission rate of 10 Mbps. Assume that the propagation speed is 2×10^8 meters/sec, and the distance between source and destination is 5,000 km.

(a) Suppose there is only one link between source and destination. Also suppose that the entire MP3 file is sent as one packet. What is the transmission delay? Show your work.

(b) What is the end-to-end delay? Show your work.

$$t = 2 \times 10^8 \text{ m/sec} \quad M_f = 50 \times 2^{20} \text{ b}$$

(a) $t_{\text{transmission}} = d/R = \frac{5 \times 10^6}{10^7} = 0.5 \text{ seconds.}$

(b) $t_{\text{prop}} = \frac{d}{s_{\text{prop}}} = \frac{5 \times 10^6}{2 \times 10^8} = 2.5 \times 10^{-2} = 25 \text{ msec.}$