

MIDTERM EXAMINATION #1 – OCT. 13, 2011
COMPUTER NETWORKS : 03-60-367-01
UNIVERSITY OF WINDSOR
SCHOOL OF COMPUTER SCIENCE
Fall 2011 - 75 minutes

This examination document contains all questions for the examination. Each student must surrender **only** their answer sheets. Each student may take this examination question paper for future reference. Although you may write on this document, it will not be graded. There is no need to place your name on this document.

PLEASE READ CAREFULLY BEFORE YOU START

1. This is a CLOSED book test; no notes, textbooks, calculators or computer aids are allowed.
2. You will be asked to sign your name once before leaving the exam room (sign-out) and after submitting your exam answer sheet (Scantron computer sheet).
3. PLACE YOUR NAME AND STUDENT ID NUMBER on the Scantron sheets provided – you must use a pencil (NO PENS). Your examination is Course/Section: 03-60-367-01
4. PLACE ANSWERS on the Scantron sheets provided – you must use a pencil (NO PENS).
5. You are not allowed to give or receive unauthorized help with your test. Any misconduct, as outlined by the Senate bylaw 31 article I, will be reported accordingly.
6. **You have 75 minutes to complete this test, starting from the time stated by the instructor.**
7. **When the instructor indicates that time has elapsed all students must stop writing answers and surrender their Scantron answer sheets immediately to the proctors.**
8. Photocopies of Scantron answer sheets will be returned to students after marking. Examination questions and answers will be provided using the course website.
9. The total (maximum possible) mark on this exam is **65**.

Good Luck!

All questions are either Multiple Choice or True-False. For each Multiple Choice question, you are to choose only one response which **best answers** the question. For True-False questions you may only choose one option (True or False). Place all answers on the Scantron sheet provided. The examination will be marked using the campus computer.

If an error is made you must carefully and completely erase your mistake and then indicate your choice of answer. Completely and carefully fill the circle that indicates your answer to each question. Make sure you have selected the correct question number on the Scantron sheet corresponding to the question on the examination question paper.

WARNING !

Read and think carefully about each question before answering.
Questions have been scrambled by topic. Keep your attention on your own test paper and answer sheet.

1. Which of the following is a proper layer of the TCP/IP stack?
 A) Link
 B) Network
 C) Transport
 D) **All of the above responses are proper layers of the TCP stack.**

2. End systems, or hosts, communicate with each other using either server or client models.
 A) True
 B) **False**

3. Consider an HTTP client that wants to retrieve a Web document at a given URL. The IP address of the HTTP server is initially unknown. What transport layer protocols are needed in this scenario?
 A) DNS and HTTP
 B) TCP for DNS; TCP for HTTP
 C) **UDP for DNS; TCP for HTTP**
 D) All of the above are correct responses.

4. The Internet may be defined as many hosts running network applications interconnected with an infrastructure consisting of communication links and routers.
 A) **True**
 B) False

5. The IETF is responsible for _____.
 A) creating new Internet protocols
 B) ensuring that the Internet is operating correctly
 C) **setting Internet standards**
 D) approving new Internet Service Providers

6. Closing a TCP socket requires _____ Acknowledgements.
 A) 0
 B) 1
 C) **2**
 D) 3

7. A single program may have several open sockets at any time.
 A) **True**
 B) False

8. Suppose Client A initiates a Telnet session with Server S. At about the same time, Client B also initiates a Telnet session with Server S. If A and B are different hosts, it is possible that the source port number in the segments from A to S is the same as that from B to S.
A) **True**
B) False
9. A network's speed is expressed in terms of _____.
A) Routing protocol
B) Round trip time
C) **Bit rate and latency**
D) I/O buffer response
10. Photonic (ie. optical) networks utilize _____ switches.
A) LAN
B) IP
C) CBR
D) **ATM**
11. With download and delete, after a user retrieves its messages from a POP server _____.
A) The user may retrieve all their messages later on any machine
B) The user may retrieve only some of their messages later on any machine
C) The messages are saved for only a limited period of time, then deleted
D) **The messages are deleted immediately after reading them**
12. All communication activity in the Internet is governed by protocols.
A) **True**
B) False
13. Both UDP and TCP require that the applications recognize their own data formats.
A) **True**
B) False
14. By using Web caching _____.
A) it is possible to reduce response time for client request
B) it is possible to reduce traffic on an institution's access link
C) the cache acts as both client and server
D) **All of the above responses are correct**

15. Applications require which of the following transport services.
- A) Data loss and Security
 - B) Timing
 - C) Throughput
 - D) All of the above responses are correct
16. Delivery and storage of email messages to a server is achieved using _____ .
- A) Post Office Protocol (POP)
 - B) Internet Mail Access Protocol (IMAP)
 - C) Simple Mail Transfer Protocol (SMTP)
 - D) Hypertext Transfer Protocol (HTTP)
17. Consider an HTTP client that wants to retrieve a Web document at a given URL. The IP address of the HTTP server is initially unknown. What application layer protocols are needed in this scenario?
- A) DNS and HTTP
 - B) TCP for DNS; TCP for HTTP
 - C) UDP for DNS; TCP for HTTP
 - D) None of the above are correct responses.
18. Hybrid Peer-to-Peer systems do not use “always on” servers.
- A) True
 - B) False
19. Interconnected routers in the Internet exist _____ .
- A) within access networks
 - B) in the network core, as a network of networks
 - C) on the network edge
 - D) None of these responses is correct
20. End systems must be connected to a(n) _____ in order to connect to an edge router.
- A) residential access network
 - B) mobile access network
 - C) institutional access network
 - D) All of these responses are correct
21. Circuit switching is used to establish dedicated network paths that may be shared by other end systems.
- A) True
 - B) False

22. Time and frequency division multiplexing schemes are used to divide link bandwidth into separately allocatable pieces.
A) True
B) False
23. Packet switching in the network core inevitably leads to _____.
A) bandwidth subdivision
B) packet loss
C) shared circuit switching
D) resource contention
24. All datagrams contain 2 ports.
A) True
B) False
25. Which of the following is not a proper layer of the TCP/IP stack?
A) Application
B) Network
C) Session
D) Link
26. Modern networks support networking sharing using techniques such as _____.
A) Time division multiplexing
B) Frequency division multiplexing
C) Packet switching
D) All of the above responses are correct
27. Message encapsulation refers to _____.
A) designating message contents with descriptive data
B) allowing for message content verification
C) reliance upon IP for transmitting messages
D) embedding payloads and protocol headers within logically layered packages
28. HTTP response messages never have an empty message body.
A) True
B) False
29. Transfer across TCP streams is full duplex.
A) True
B) False

30. A DNS resource record is a tuple that contains _____.
A) Name, Value, Type, Time-to-live
B) Name, Value, Type
C) Name, Value, Time-to-live
D) Name, Type, Time-to-live
31. TCP abstracts data communication to appear as an apparent stream of flowing data.
A) True
B) False
32. The socket that represents a 'passive open' is a(n) _____ socket.
A) Server
B) Client
C) TCP
D) Application
33. HTTP is referred to as a stateless protocol because _____.
A) clients do not maintain historic information about transactions with servers
B) servers and clients do not maintain open connections
C) server maintains no information about past client requests
D) All of the above responses are correct
34. Peer-to-Peer networks are used _____.
A) for content sharing
B) for Instant Messaging
C) for IP based telephony
D) All of the above responses are correct.
35. Suppose Host A is sending Host B a large file over a TCP connection. The number of unacknowledged bytes that A sends cannot exceed the size of the receive buffer.
A) True
B) False
36. Round-trip time (RTT) is estimated based on _____.
A) a weighted average RTT that is fixed after several samples
B) a weighted average RTT that is continuously updated
C) sampling of routes to determine minimum cost paths
D) None of these responses is correct.

37. With non-persistent connections between browser and origin server, it is not possible for a single TCP segment to carry two distinct HTTP request messages.
A) True
B) False
38. Transport services and protocols provide logical communication between hosts.
A) True
B) False
39. Connectionless demultiplexing may be performed using _____.
A) TCP
B) UDP
C) ICMP
D) All of the above are correct responses.
40. The action of a sender involving the gathering of data from multiple sockets and enveloping the data with a header is called _____.
A) Multiplexing
B) Packet creation
C) Data integration
D) Demultiplexing
41. Multiple TCP streams can distinguished on a given machine using _____.
A) Ports
B) DNS addresses
C) network interface cards
D) All of the above responses are correct.
42. Transport services and protocols _____.
A) provide communication between system processes running on different hosts
B) are provided in hosts and routers
C) make more than one transport protocol available to applications
D) All of the above responses are correct

43. Hosts A and B are directly connected with a 200 Mbps link. There is one TCP connection between the two hosts, and Host A is sending to Host B an enormous file over this connection. Host A can send application data into the link at 100 Mbps, but Host B can read out of its TCP receive buffer at a maximum rate of 50 Mbps. The long term average rate at which Host A sends data is approximately _____ .
- A) 50 Mbps
 - B) 75 Mbps
 - C) 100 Mbps
 - D) 200 Mbps
44. A user requests a Web page that consists of some text and two images. For this page, the client will send one request message and receive three response messages.
- A) True
 - B) False
45. Consider a packet of length 2048 bytes. Assuming the packet must travel over a link of distance 5000 kilometers with propagation speed 5×10^8 m/s and transmission rate 4 Mbps, what is the propagation delay?
- A) 21 millisecc
 - B) 10 millisecc
 - C) 1 millisecc
 - D) 10 microsecc
46. Internet protocols define _____ .
- A) format of messages
 - B) actions taken on message transmission and receipt
 - C) order of messages sent and received among network entities
 - D) All of these responses are correct
47. UDP provides unreliable transfer of datagrams between client and server.
- A) True
 - B) False
48. In packet switched networks, store and forward refers to: _____ .
- A) entire message must arrive at router before it can be transmitted on next link
 - B) scheduling of packets to avoid congestion
 - C) entire packet must arrive at router before it can be transmitted on next link
 - D) entire packet must be stored on router until acknowledgement received

49. Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates $R_1 = 800$ Kbps, $R_2 = 2$ Mbps and $R_3 = 1$ Mbps. Assuming no other traffic in the network, what is the throughput for the file transfer?
- A) 800 Kbps
 - B) 2 Mbps
 - C) 1 Mbps
 - D) 3.5 Mbps
50. Packet loss occurs when the packet arrival rate to a link exceeds the output link capacity.
- A) True
 - B) False
51. Packet delay may be caused by _____ .
- A) time required for nodal processing requirements
 - B) time required for queueing
 - C) transmission and propagation times
 - D) All of these responses are correct.
52. Packet loss _____ .
- A) may be dealt with by retransmitting packets, or ignoring them completely
 - B) may be reduced or eliminated by expanding hardware buffers
 - C) Both A and B responses are correct.
 - D) None of these responses is correct.
53. A Denial-of-Service attack can be performed by bombarding a server with connection requests.
- A) True
 - B) False
54. Trojan Horses may be embedded in web page plug-ins.
- A) True
 - B) False
55. Sending packets with false source address is called _____ .
- A) Packet sniffing
 - B) IP spoofing
 - C) Record and Playback
 - D) Worms

56. A stream is a sequence of packets that flow into or out of a process.
 A) True
 B) False
57. TCP and UDP are sometimes called connection oriented protocols.
 A) True
 B) False
58. Two distinct document references (for example, cs.uwindsor.ca/60-367/index.html and cs.uwindsor.ca/60-367/image01.jpeg) can be sent over the same persistent connection.
 A) True
 B) False
59. Consider an HTTP client that wants to retrieve a Web document at a given URL. The IP address of the HTTP server is initially unknown. What application layer protocols are needed in this scenario?
 A) DNS and HTTP
 B) TCP for DNS; TCP for HTTP
 C) UDP for DNS; TCP for HTTP
 D) None of the above are correct responses.
60. HTTP is called a _____ protocol / SMTP is called a _____ protocol.
 A) Pull (HTTP) / Push (SMTP)
 B) Push (HTTP) / Pull (SMTP)
 C) Push (HTTP) / Push (SMTP)
 D) Pull (HTTP) / Pull (SMTP)
61. Using TCP, _____ message(s) are exchanged before a connection exists.
 A) One
 B) Two
 C) Three
 D) None of these are correct responses.
62. MIME protocol refers to _____.
 A) micromedia email extension
 B) movement for internet multimedia email
 C) multimedia mail extension
 D) None of these responses are correct.

63. The type of domain that deals with *edu, com, net, org*, and other similar extensions, is called a _____ .
- A) Root DNS servers
 - B) Top-level DNS servers
 - C) Authoritative DNS servers
 - D) Local DNS servers
64. In TCP based demultiplexing, TCP sockets are identified by _____ .
- A) both sender and receiver port numbers
 - B) sender IP address and port numbers
 - C) receiver IP address and port number
 - D) both sender and receiver IP addresses and port numbers
65. UDP and TCP are examples of _____ layer protocols.
- A) Application
 - B) Link
 - C) Transport
 - D) Network

End of Examination.