MIDTERM EXAMINATION #1 – OCT. 16, 2013
COMPUTER NETWORKS : 03-60-367-01
UNIVERSITY OF WINDSOR
SCHOOL OF COMPUTER SCIENCE
Fall 2013 - 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 if it is submitted. 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. <u>Photocopies</u> 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 <u>only one</u> response which **best answers** the question. For True-False questions you may <u>only</u> choose one option (True <u>or</u> False). There may be up to five (5) response options for some questions. 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.   UDP provides unreliable transfer of datagrams between client and server.
        A) True
        B) False

2.   Protocols are not required to govern communication activity in the Internet.
        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 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 responses above is correct.

4.   The HTTP protocol _____ .
        A) is stateless
        B) uses persistent connections
        C) can use non-persistent connections
        D) All of the responses above are correct.

5.   In circuit switching networks, which of the following options is true?
        A) Transmission rate cannot be guaranteed.
        B) The resources needed along a path are reserved.
        C) Uses the resources on demand.
        D) A and B responses are both correct.

6.   _____ delay is the result when packets wait to be transmitted onto the next
        link.
        A) Queuing
        B) Transmission
        C) Propagation
        D) Nodal processing

7.   Which option below keeps track of users?
        A) TCP
        B) Cookie
        C) Socket
        D) All of the responses above are correct.

8. Which of the following options show the correct name for a packet of information in each layer?
    A) application layer: frame, Transport layer: segment, Network layer: datagram, Link layer: message
    B) application layer: message, Transport layer: frame, Network layer: datagram, Link layer: segment
    C) application layer: message, Transport layer: segment, Network layer: datagram, Link layer: frame
    D) None of the responses above is correct.

9. Which one is correct about HTTP and SMTP?
    A) both transfer files
    B) both use UDP
    C) both use TCP
    D) A and C are both correct responses.

10. 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

11. Which one is not a service provided by DNS?
    A) translating host names
    B) Mail server aliasing
    C) load distribution
    D) congestion control

12. Which of the options uses a P2P protocol?
    A) POP3
    B) DNS
    C) HTTP
    D) BitTorrent

13. 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 the responses above are correct

14   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

15.   Ethernet is _____ .
   A) One of the physical media
   B) One of the LAN technologies
   C) One of the WAN technologies
   D) A client-server network

16.   Which of the following is a proper layer of the TCP/IP stack?
   A) Session
   B) Network
   C) Transport
   D) Presentation
   E) B and C are both correct.

17.   The ISO/OSI reference Model has seven layers.
   A) True
   B) False

18.   Transport services and protocols provide logical communication between hosts.
   A) True
   B) False

19.   SSL was added as an enhancement to TCP in order to provide process-to-process
        security.
   A) True
   B) False

20.   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.

21. 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.

22. 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

23. 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, is it permissible that the source port number in the segments from A to S is the same as that from B to S.
    A) Yes
    B) No

24. 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
    E) Delay and Routing

25. Photonic (ie. optical) networks utilize _____ switches.
    A) LAN
    B) TCP/IP
    C) CBR
    D) analog
    E) ATM

26. 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 deleted immediately after reading them
    D) The messages are saved for only a limited period of time, then deleted
    E) None of the responses above are correct.

27. Which layer is in charge of flow control?
    A) Application
    B) Network
    C) Physical
    D) Transport

28. The time it takes for a small packet to travel from client to server and then back to the client is called _____ .
    A) Round-trip time
    B) Propagation time
    C) Transmission time
    D) Delay time

29. Both UDP and TCP require that the applications recognize their own data formats.
    A) True
    B) False

30. 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

31. Applications require which of the following transport services.
    A) Data loss
    B) Timing
    C) Throughput
    D) Security
    E) All of the above responses are correct

32. Trojan Horses may be embedded in web page plug-ins.
    A) True
    B) False

33. 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)
    E) All of these responses are correct.

34. A stream is a sequence of _____ that flow into or out of a process.
    A) packets
    B) segments
    C) characters
    D) bytes

35. HTTP is called a _____ protocol.
    A) Pull
    B) Push

36. WiMax _____ .
    A) is a long-distance version of WiFi
    B) promises speeds of 5 to 10Mbps or higher
    C) supports distances of tens of kilometers
    D) All of the above responses are correct.

37. Which of the following options control the sending and receiving of information within the Internet?
    A) protocols
    B) packets
    C) ISP
    D) RFC

38. Hybrid Peer-to-Peer systems do not use "always on" servers.
    A) True
    B) False

39. Circuit switching is used to establish dedicated network paths that may be shared by other end systems.
    A) True
    B) False

40. Time and frequency division multiplexing schemes are used to divide link bandwidth into separately allocatable pieces.
    A) True
    B) False

41. HTTP response messages never have an empty message body.
    A) True
    B) False

42.   Packet switching in the network core inevitably leads to _____ .
        A) bandwidth subdivision
        B) packet loss
        C) shared circuit switching
        D) resource contention

43.   All datagrams contain 2 ports.
        A) True
        B) False

44.   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

45.   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

46.   Transfer across TCP streams is full duplex.
        A) full duplex
        B) half duplex
        C) best available duplex
        D) None of the responses above is correct.

47.   A DNS resource record is a tuple that contains _____ .
        A) Name, Value
        B) Name, Value, Type
        C) Name, Value, Time-to-live
        D) Name, Type, Time-to-live
        E) Name, Value, Type, Time-to-live

48.   TCP abstracts data communication to appear as an apparent stream of flowing data.
   A) True
        B) False

49. Which option describes the server program in a connection-oriented transport service?
    A) Create socket and then, in a loop, wait for incoming connection request, read request, write reply, then close
    B) Create socket, send request, read reply, close
    C) Create socket, read request, write reply
    D) Create socket, send request, read reply, close

50. What is a Distributed Hash Table (DHT)?
    A) A Server side searching table.
    B) It is used in DNS.
    C) An indexing and searching technique for a P2P network.
    D) None of the responses above is correct.

51. The socket that represents a 'passive open' is a(n) _____ socket.
    A) Server
    B) Client
    C) TCP
    D) Application

52. 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

53. 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 the responses above are correct

54. HTTP is referred to as a stateless protocol because _____ .
    A) servers and clients do not maintain open connections
    B) clients do not maintain historic information about transactions with servers
    C) servers maintain no information about past client requests
    D) None of the responses above is correct.

55. SMTP is called a _____ protocol.
    A) Pull
    B) Push

56. Suppose a Client is downloading a 5MB file from a Server, through a single communication link, with bandwidth capacity of 100Mbps, as in the diagram below.

If the distance between the Client and the Server is 4000 Km and the propagation speed through the medium is 2×10^8 m/s, then the propagation delay is _____ .
A) 0.4 seconds
B) 0.04 seconds
C) 0.02 seconds
D) 0.2 micro-seconds

57. Suppose a Client is downloading a 5MB file from a Server, through a single communication link, with bandwidth capacity of 100Mbps, as in the diagram below.
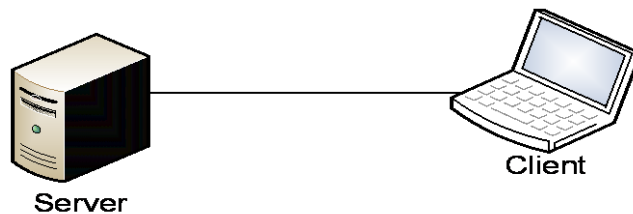
If the distance between the Client and the Server is 4000 Km and the propagation speed through the medium is 2×10^8 m/s, then the transmission delay is _____ .
A) 0.4 seconds
B) 0.04 seconds
C) 0.02 seconds
D) 0.2 micro-seconds

58. A process sends messages into, and receives messages from, the network through a software interface called a _____ .
A) CODEC
B) multiplexer
C) socket
D) cookie

59. A Denial-of-Service attack can be performed by bombarding a server with connection requests.
A) True
B) False

60. The ability to inject packets into the Internet with a false source address is known as
    _____ .
    A) IP spoofing
    B) IP sniffing
    C) IP phishing
    D) Man-in-the-middle attack

61. 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.

62. 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.

63. 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

64. 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) is not a problem with current technologies
    D) Both A and B responses are correct.
    E) None of these responses is correct.

65. 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.

End of Examination.