

**MIDTERM EXAMINATION #1**  
**COMPUTER NETWORKS : 03-60-367-01**  
**UNIVERSITY OF WINDSOR**  
**SCHOOL OF COMPUTER SCIENCE**  
*Sample Questions and Answers - 75 minutes*

This examination document contains all questions for the examination. Each student must surrender **only** their answer sheets. Each student may take home 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. 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 **95**.

*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). 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 an approved computer in ITS.

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.**

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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 responses on the Scantron sheet provided. In each case, be sure to carefully check the question number on both this examination paper and also the Scantron sheet. Completely fill in the circular area on the Scantron sheet, once again making sure to choose the correct circle corresponding to the examination question responses provided.

If an error is made you must carefully and completely erase the incorrect circular area on the Scantron sheet, then completely fill in the corrected circle you have selected.

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1. 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**
  
2. 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
  
3. The IETF is responsible for \_\_\_\_\_.  
A) creating new Internet protocols  
B) ensuring that the Internet is operating correctly  
C) approving new Internet Service Providers  
**D) setting Internet standards**
  
4. The Internet is described as being \_\_\_\_\_ hierarchical.  
A) strictly  
**B) loosely**  
C) non-  
D) completely
  
5. 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**
  
6. All communication activity in the Internet is governed by protocols.  
**A) True**  
B) False

7. 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
8. End systems, or hosts, communicate with each other using either server or client models.  
A) True  
B) False
9. 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
10. Circuit switching is used to establish dedicated network paths that may be shared by other end systems.  
A) True  
B) False
11. Time and frequency division multiplexing schemes are used to divide link bandwidth into separately allocatable pieces.  
A) True  
B) False
12. Packet switching in the network core inevitably leads to \_\_\_\_\_.  
A) bandwidth subdivision  
B) packet loss  
C) shared circuit switching  
D) resource contention
13. 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

14. Packet loss occurs when the packet arrival rate to a link exceeds the output link capacity.  
A) True  
B) False
15. 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.
16. The Traceroute program provides a measurement of delay from source to router along an end-to-end Internet path towards the destination.  
A) True  
B) False
17. 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.
18. End-to-end throughput is most affected by \_\_\_\_\_.  
A) congestion delays  
B) buffer sizes  
C) bottleneck links  
D) All of these responses are correct.
19. Two distinct document references (for example, cs.uwindsor.ca/60-367/index.html and cs.uwindsor.ca/60-367/outline.doc) can be sent over the same persistent connection.  
A) True  
B) False
20. With non-persistent connections between browser and origin server, it is possible for a single TCP segment to carry two distinct HTTP request messages.  
A) True  
B) False

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 application layer protocols besides HTTP 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. 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 besides HTTP 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.
23. Which of the following is not a proper layer of the TCP stack?  
A) Link  
B) Network  
C) Session  
D) Transport
24. Which of the following is not a proper layer of the OSI stack?  
A) Propagation  
B) Network  
C) Session  
D) Link
25. UDP and TCP are reliable protocols.  
A) True  
B) False
26. Most local area networks use electrostatic network hardware.  
A) True  
B) False
27. Network speed is expressed in terms of \_\_\_\_\_.  
A) Routing protocol  
B) Round trip time  
C) Bit rate and latency  
D) I/O buffer response

28. Photonic (optical) networks utilize \_\_\_\_\_ switches.  
A) LAN  
B) IP  
C) CBR  
D) ATM
29. TCP abstracts data communication to appear as an apparent stream of flowing data.  
A) True  
B) False
30. TCP can process incoming packets that arrive out of order since packets are numbered.  
A) True  
B) False
31. Both UDP and TCP require that the applications recognize their own data formats.  
A) True  
B) False
32. Transfer across TCP streams is full duplex.  
A) True  
B) False
33. Using TCP, two messages are exchanged before a connection exists.  
A) True  
B) False
34. Multiple TCP streams can be distinguished on a given machine using \_\_\_\_\_.  
A) ports  
B) IP addresses  
C) network interface cards  
D) All of the above responses are correct.
35. A machine (and even a single program) may have several open sockets at any time.  
A) True  
B) False
36. All datagrams contain 2 ports.  
A) True  
B) False

37. 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 message payloads and protocol headers within logically layered packages
38. UDP and TCP are examples of \_\_\_\_\_ layer protocols.  
A) Application  
B) Presentation  
C) Transport  
D) Network
39. Transport services and protocols \_\_\_\_\_.  
A) provide logical communication between app processes running on different hosts  
B) are provided in end systems  
C) make more than one transport protocol available to applications  
D) All of the above responses are correct
40. 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
41. 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
42. Cookies may be used to maintain user-server state.  
A) True  
B) False
43. 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

44. 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)
45. All forms of Peer-to-Peer systems are able to avoid using “always on” servers.  
A) True  
B) False
46. Peer-to-Peer networks are used \_\_\_\_\_.  
A) for content file sharing  
B) for Instant Messaging  
C) for IP based telephony  
D) All of the above responses are correct.
47. Domain Name System (DNS) is an application-layer protocol where host, routers and name servers communicate to resolve names (that is, provide address/name translation).  
A) True  
B) False
48. Domain Name System (DNS) services are required to \_\_\_\_\_.  
A) permit aliasing of host names  
B) translate canonical names to IP address formats  
C) permit aliasing of email servers  
D) All of these responses are correct.
49. Centralization of DNS services is considered to be a poor design approach because \_\_\_\_\_.  
A) it requires a distributed database  
B) it is costly to maintain  
C) it does not scale  
D) All of these responses are correct.
50. Host A is sending Host B a large file over a TCP connection. Assume Host B has no data to send Host A. Host B will not send acknowledgments to host A, because Host B cannot piggyback the acknowledgments on data.  
A) True  
B) False



51. A server that is responsible for country domains, such as uk, fr, ca, jp and so, is called a \_\_\_\_\_ .
- A) POP server
  - B) authoritative domain server
  - C) top level domain server
  - D) DNS server
52. A promising approach to solving the problem of query flooding on P2P networks is the use of \_\_\_\_\_ to limit query forwarding.
- A) logical overlay networks
  - B) circuit based switching emulated on top of packet switching
  - C) load balancing
  - D) index servers
53. Public domain protocols \_\_\_\_\_ .
- A) allow for interoperability
  - B) are defined in RFC's
  - C) Both A and B responses are correct.
  - D) None of these responses are correct.
54. TCP flow control \_\_\_\_\_ .
- A) stops senders from overwhelming receivers
  - B) determines the reliability of message transmission
  - C) Provides minimum guarantees of service
  - D) throttles the sender when the network is overloaded
55. UDP service does require connection setup and provides congestion control.
- A) True
  - B) False
56. 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  $R_1 = 500$  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) 500 kbps
  - B) 2 Mbps
  - C) 1 Mbps
  - D) 1.67 Mbps

57. The BitTorrent application defines *torrent* as \_\_\_\_\_.  
A) the tracking of peers participating in torrent  
B) the speed of delivery of file chunks to requesters  
C) a group of peers exchanging chunks of a file  
D) the indexing of file chunk locations for speedy retrieval
58. The client upload rate for P2P versus Client-Server approaches is essentially \_\_\_\_\_.  
A)  $N$   
B)  $\log_2(N)$   
C)  $N^2$   
D) None of these responses are correct.
59. Skype uses a proprietary application protocol.  
A) True  
B) False
60. DNS resource records are stored in the tuple (*name*, *value*, *type*, *ttl*). If *type*="CNAME", it means that *name* refers to \_\_\_\_\_.  
A) the real name for some alias name  
B) the alias name for some canonical name  
C) the canonical name for some alias name  
D) None of these responses are correct.
61. Network layer services and protocols \_\_\_\_\_.  
A) are provided in hosts and routers  
B) provide communication between system processes running on different hosts  
C) make more than one transport protocol available to applications  
D) All of the above responses are correct.
62. In TCP, congestion control is handled by \_\_\_\_\_.  
A) Increasing CongWin by one message size every round trip time  
B) Decreasing CongWin by one-half after each message loss  
C) Exponentially increasing the rate of sending messages until losses occur  
D) Both A and B responses above are correct
63. ATM based ABR provides that \_\_\_\_\_.  
A) the network gives a "plastic" service  
B) senders be throttled to the minimum guaranteed rate  
C) senders be throttled to the maximum guaranteed rate  
D) Both A and C responses are correct

64. In datagram networks packets between the same source-destination pair may take different paths.  
A) True  
B) False
65. In datagram networks the time a datagram spends in a router buffer is controlled by the round trip time.  
A) True  
B) False
66. When too many sources send too much data too fast for the network to handle, it is called \_\_\_\_\_.  
A) unreliability  
B) flow control  
C) traffic delay  
D) congestion
67. In TCP, a segment should be retransmitted when \_\_\_\_\_.  
A) ACKs are received before timeout  
B) ACKs are not received  
C) when more than one ACK is received for the same segment  
D) All of these responses are correct.
68. 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: datagram, Transport layer: segment, Network layer: message, Link layer: frame  
D) application layer: message, Transport layer: segment, Network layer: datagram, Link layer: frame  
E) None of the responses above is correct.
69. 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

70. Protocols are not required to govern communication activity in the Internet.  
A) True  
B) False
71. \_\_\_\_\_ delay is the result when packets wait to be transmitted onto the next link.  
A) Queuing  
B) Transmission  
C) Propagation  
D) Nodal processing
72. 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.
73. The socket that represents a 'passive open' is a(n) \_\_\_\_\_ socket.  
A) Server  
B) Client  
C) TCP  
D) Application
74. Time and frequency division multiplexing schemes are used to divide link bandwidth into separately allocatable pieces.  
A) True  
B) False
75. HTTP response messages may have an empty message body.  
A) True  
B) False
76. Packet switching in the network core inevitably leads to \_\_\_\_\_.  
A) bandwidth subdivision  
B) packet loss  
C) shared circuit switching  
D) resource contention

77. 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
78. The HTTP protocol \_\_\_\_\_.  
A) is stateless  
B) uses persistent connections  
C) can use non-persistent connections  
D) All of the responses above are correct.
79. Which option below keeps track of users?  
A) TCP  
B) Cookie  
C) Socket  
D) All of the responses above are correct.
80. Which of the options below uses a P2P protocol?  
A) POP3  
B) DNS  
C) HTTP  
D) BitTorrent
81. The time it takes for a small packet to travel from client to server and then back to the client is called \_\_\_\_\_.  
A) Propagation time  
B) Transmission time  
C) Round-trip time  
D) Delay time
82. FTP separates control and data connections by using 2 sockets.  
A) True  
B) False
83. SMTP is called a \_\_\_\_\_ protocol.  
A) Pull  
B) Push

84. Throughput in a network is determined by the \_\_\_\_\_ that constrains the time of end to end message delivery.  
A) bottleneck link  
B) minimum propagation delay  
C) maximum congestion delay  
D) All of the above responses are correct
85. 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.
86. 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
87. A stream is a sequence of \_\_\_\_\_ that flow into or out of a process.  
A) characters  
B) bytes  
C) segments  
D) packets
88. HTTP is called a \_\_\_\_\_ protocol.  
A) Pull  
B) Push
89. A server host may support many simultaneous TCP sockets.  
A) True  
B) False
90. A Denial-of-Service attack can be performed by bombarding a server with connection requests.  
A) True  
B) False

91. 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 8000 Km and the propagation speed through the medium is  $2 \times 10^8$  m/s, then the transmission delay is \_\_\_\_\_ .

- A) 0.4 seconds
  - B) 0.04 seconds
  - C) 0.02 seconds
  - D) 0.2 micro-seconds
92. 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
93. Services that are not available in the Transport Layer include \_\_\_\_\_ .
- A) Congestion control
  - B) Delay guarantees
  - C) Bandwidth guarantees
  - D) Connection setup
  - E) Both B and C responses are correct.
94. 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.
95. The acronym IETF is actually called the \_\_\_\_\_ .
- A) Independent Engineering Task Force
  - B) Internet Engineering Task Force
  - C) Internet Engineering Technical Framework
  - D) Internet Engineering Technology Framework