THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

ACS-3911-050 Computer Networks Winter 2020

Mid-term Test, February 24ᵗʰ, 2020

Student Number: _____   **Student Name:** _____

Instructions: **Please fill in your student number and your name on the exam paper and the answer sheet. There are 60 multiple choice questions; each question is worth 1 mark, and the exam is 60/60. You have 1 hour and 30 minutes to complete the exam. Please mark only <u>one answer</u>, and ensure the answer is clearly marked on the answer sheet, else no mark will be given. Multiple answers are not allowed. Attempt all questions, marks will not be deducted for wrong answer. If there is any question on the exam, please raise your hand and I will come to you to answer your question. Once you finished, you can hand in your exam paper/answer sheet and please leave the classroom quietly as there may be others still working on their exam. If you need to obtain your exam score, please email me one week after the exam date. Good Luck.**

1. Hosts and end systems are the same computing devices in the internet, true or false
   a) True
   b) False

2. Which statement describe what a network protocols is
   a) Define only the order of messages send among network entities, and the actions taken on messages transmission.
   b) Define format of messages send and received among network entities.
   c) Define format and order of messages send and received among network entities, and actions taken on messages transmission and receipt.
   d) Define format and order of messages send and received among network entities

3. What end systems are connected to the edge router?
   a) Residential access networks
   b) Institutional access networks (university, corporations and etc.,)
   c) Mobile access networks
   d) All of the above

4. Physical media can be classify into two classes – guided media and unguided media – which statement is true for guided media
   a) Signal is carried by electromagnetic spectrum, no physical "wire", and bidirectional
   b) Signal is carried by electromagnetic spectrum, require physical "wire", and unidirectional
   c) Signal is carried by electromagnetic spectrum, no physical "wire", and unidirectional
   d) Signal is carried by electrical pulse, require physical "wire", and bidirectional

5. What are the two key functions of Packet-Switching
   a) Store and Forward
   b) Routing and Forwarding
   c) Routing and Store
   d) Break message into packets and transmit

6. Of the four sources of packer delay, which one is consider variable
   a) Nodal processing
   b) Queueing delay
   c) Transmission delay
   d) Propagation delay

7. Transmission delay is different from propagation delay, true or false
   a) True
   b) False

8. The cause of packet loss is due to limited buffer (queue) and packet arriving to full queue will be dropped because the lack of buffer space, true or false
   a) True
   b) False

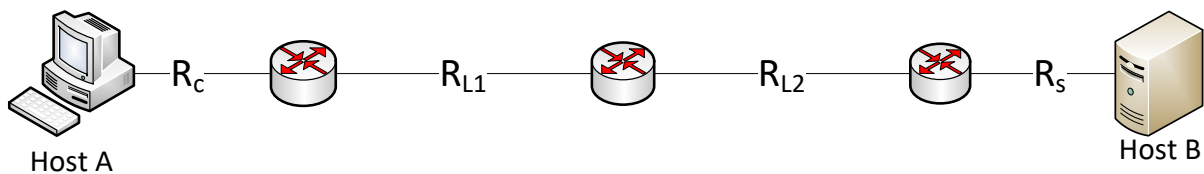Please use Figure 1 to answer question 9.

Figure 1

9. Host A is to send a large file to Host B. The path from Host A to Host B has three links of rates R_C = 10 Mbps, R_{L1} = 1.5 Mbps, R_{L2} = 2 Mbps, and R_S = 1 Gbps (Figure 1). Assuming no other traffic in the network, what is the throughput for the file transfer
   a) 1.5 Mbps
   b) 2 Mbps
   c) 10 Mbps
   d) 1 Gbps

10. What statement is true for having Protocol Layering
    a) Protocol layering can only be implemented in software
    b) The Protocol Layer work independently by itself
    c) By layering or modularization, it makes maintenance and updating system an easier task
    d) Protocol Layer has no structure and conceptual advantages

11. Which is the correct Internet Protocol Stack listed from the bottom layer up to the top
    a) Application, Transport, Network, Link, Physical
    b) Physical, Link, Network, Transport, Application
    c) Application, Network, Transport, Link, Physical
    d) Application, Transport, Link, Network, Physical

12. Between the ISO/OSI Protocol Stack and the Internet Protocol stack, what are the two layers that are not in the Internet Protocol Stack
    a) Presentation and Session
    b) Session and Transport
    c) Network and Link
    d) Presentation and Network

13. The Internet was designed with no security in mind, true or false
    a) True
    b) False

14. Which statement is true for virus
    a) Does not replicate itself once it infected a target
    b) Self-replicating infection by receiving passively object that self-execute
    c) Self-replicating infection by receiving through e-mail and opening an email attachment
    d) Does not require any user intervention to get infected

15. Which statement is true for worms
    a) Does not replicate itself once it infected a target
    b) Self-replicating infection by receiving through e-mail and opening an email attachment
    c) Self-replicating infection by receiving passively object that self-execute
    d) Require any user intervention to get infected

16. Which type of network attack is consider to be passive and difficult to detect
    a) IP spoofing
    b) Packet sniffing
    c) Denial-of-service (DoS)
    d) None of the above

17. What type of servers/networks can be subjective to a Denial-of-Service (DoS) attack
    a) Web Server
    b) E-mail server
    c) DNS server
    d) All of the above

18. What are the three common categories of today Internet Denial-of-Service (DoS)
    a) Brute force attack, sniffer attack, comprised-key attack
    b) Vulnerability attack, bandwidth flooding, and connection flooding
    c) Identity spoofing, spear phishing, bandwidth flooding
    d) Brute force attack, spear phishing, comprised-key attack

19. In a client-server architecture, the server or servers are
    a) Not always on, have a dynamic IP address, locate in a data centres for scalability
    b) Always on, have a permanent IP address; locate in a data centres for scalability
    c) Always on, have a dynamic IP address, single server
    d) Not always on, have a permanent IP address, locate in a data centres for scalability

20. In a client-server architecture, the clients
    a) Communicate directly with a server, connect intermittently, uses a dynamic IP address and does not communicate with other client
    b) Communicate directly with a server, connect intermittently, uses a dynamic IP address, and communicate with other client
    c) Does not communicate with a server, connect intermittently, uses a dynamic IP address and communicate with other client
    d) Does not communicate directly with a server, connect intermittently, uses a dynamic IP address and does not communicate with other client

21. In a Peer-to-Peer (P2P) architecture, the client
    a) Communicate with other client, only provide service, self-scalability and simple management
    b) Communicate with other client, both providing service and requesting service, self-scalability and complex management
    c) Communicate with other client, both providing service and requesting service, non-scalability and simple management
    d) Communicate with other client, only request service, self-scalability and complex management

22. What are the two processes that a network application needs to send message over a network
    a) Client process and server process
    b) Client process and security process
    c) Host process and network process
    d) Inter process and network process

23. A _____ is a software interface that allow process to send message into, and receive message from the network
    a) gate
    b) socket
    c) window
    d) circuit

24. What are the characteristic of Transmission Control Protocol (TCP)
    a) Reliable transport, provides timing and throughput guarantee, and is connection-oriented
    b) Reliable transport, provide flow and congestion control, and is connectionless
    c) Reliable transport, provide flow and congestion control, and is connection-oriented
    d) Reliable transport, provide flow and congestion control, security and is connection-oriented

25. What are the characteristic of User Datagram Protocol (UDP)
    a) Reliable transport, provides timing and throughput guarantee, and is connection-oriented
    b) Unreliable transport, do not provide flow and congestion control, and is connectionless
    c) Reliable transport, provide flow and congestion control, and is connection-oriented
    d) Unreliable transport, provide flow and congestion control, security and is connection-oriented

26. Hypertext Transfer Protocol (HTTP) is a Peer-to-Peer , true or false
    a) True
    b) False

27. Hypertext Transfer Protocol (HTTP) is a
    a) Web application layer protocol, use UDP to connect, and use the standard port 443
    b) Web application layer protocol, use UCP to connect, is stateless, and can use any available port number
    c) Web application layer protocol, use TCP to connect, is stateless, and use the standard port 80
    d) Web application layer protocol, use TCP to connect, is stateless, and use the standard port 443

28. Cookie use by website has no privacy issues, true or false
    a) True
    b) False

29. Two distinct Web pages (for example, www.mit.edu/research.html and www.mit.edu/students.html) cannot be sent over the same persistent connection, true or false
    a) True
    b) False

30. A HTTP mechanism that allows a cache to verify an object is up to date is called
    a) Conditional Put
    b) Conditional Get
    c) Conditional Post
    d) Conditional Head

31. A HTTP conditional Get request is send to the web server, if the requested object has not change, the server will
    a) Not send a response message back to the client
    b) Send a response message indicated the object has not been modified together with the requested object
    c) Send a response message indicated the object has not been modified and not include the requested object in the message
    d) Send a response message indicated the object has been modified and include the requested object in the message

32. Web caches or Proxy server is to help
    i. Reduce response time for client request
    ii. Reduce traffic on an institution's access link
    iii. Increase the cost to upgrade to a higher access link
    iv. Increase traffic on an institution's access link
    a) i and ii
    b) i, ii, and iv
    c) ii, iii and iv
    d) i, ii, and iii

33. For an Email system to function correctly, how many component(s) needs to work together?
    a) 2
    b) 3
    c) 4
    d) 6

34. Which statement describe Simple Mail Transfer Protocol (SMTP)
    a) Use TCP, Port 25, direct transfer from sending server to receiving server, does a three phases transfer
    b) Use UDP, Port 25, direct transfer from sending server to receiving client, does a two phases transfer
    c) Use TCP, Port 25, direct transfer from sending server to receiving client, does a three phases transfer
    d) Use TCP, Port 25, direct transfer from sending client to receiving client, does a three phases transfer

35. What are the three most popular mail access protocol
    a) Microsoft Outlook, Mozilla's Thunderbird and KMail
    b) POP3, IMAP, and HTTP
    c) Gmail, Lycos Mail, and Yahoo! Mail
    d) MAPI, MSA and SMNP

36. What statement is true for Simple Mail Transfer Protocol (SMTP) and Post Office Protocol 3 (POP3)
    a) SMTP is use for retrieve email message from the server to the client, POP3 is to send email message from client to server
    b) SMTP is use for sending email message from the server to the client, POP3 is to retrieve email message from client to server
    c) SMTP is use for sending email message from the client to the server, POP3 is to retrieve email message from server to client
    d) SMTP and POP3 does the same function, both send and retrieve email message from and to the client and server, vice versa

37. What are the three phases POP3 progresses after the TCP connection established
    a) Authorization, Transaction and Update
    b) Authorization, Download, and Delete
    c) Update, Download, and Keep
    d) Authorization, Download, and Update

38. POP3 server do not keep track of state across session, true or false
    a) True
    b) False

39. Why is IMAP a better mail access protocol than POP3
    a) Message are downloaded to the user's system and then deleted on the server
    b) Message is kept in the server, allow users organize messages in folder, and keep state across session
    c) Have two modes for user to choose from in managing the message on the server
    d) Do not keep state across sessions

40. Domain Name System uses
    a) A centralize database to manage name resolution
    b) A distributed database to manage name resolution
    c) Both a centralize and multiple distributed database to manage name resolution
    d) None of the above

41. What is the primary purpose of the Domain Name System (DNS)
    a) Host aliasing
    b) Host name to IP address resolution
    c) Mail server aliasing
    d) Load distribution

42. Doman Name System (DNS) use which standard port
    a) Port 20
    b) Port 21
    c) Port 443
    d) Port 53

43. What transport protocol does DNS use over the internet
    a) TCP
    b) UDP
    c) ICMP
    d) IP

44. What are the three classes of servers in DNS hierarchy
    a) Root DNS servers, TLD Servers, and Local DNS servers
    b) Root DNS servers, TLD Servers, and Authoritative DNS servers
    c) TLD Servers, Authoritative DNS servers and Local DNS servers
    d) Root DNS servers, Authoritative DNS servers and Local DNS servers

45. In a DNS record, the record type CNAME is for
    a) The hostname and its IP address
    b) The domain name and the hostname of the authoritative name server for that domain
    c) The name mail server that is associated to a host name
    d) The alias name of a hostname

46. In a DNS record, the record type NS is for
    a) The hostname and its IP address
    b) The domain name and the hostname of the authoritative name server for that domain
    c) The name mail server that is associated to a host name
    d) The alias name of a hostname

Use the list of DNS records to answer question 47 to question 50 (TTL is ignored)
   i. (ad1.abc.com, 192.168.200.50, A)
   ii. (ns1.abc.com, 192.168.200.55, A)
   iii. (exch1.abc.com, 192.168.200.60, A)
   iv. (web1.abc.com, 192.168.200.65, A)
   v. (abc.com, ns1.abc.com, NS)
   vi. (abc.com, exch1.abc.com, MX)
   vii. (abc.com, web1.abc.com, CNAME)

47. From the list of DNS record above, which record(s) provide standard hostname-to-IP Address mapping
    a) i, ii, iii, vi
    b) i, ii, iii, iv
    c) i, v, vi vii
    d) i, iv, vi, vii

48. From the list of DNS records above, what is the company mail server IP address
    a) 192.168.200.50
    b) 192.168.200.55
    c) 192.168.200.60
    d) 192.168.200.65

49. From the same list of DNS records, what is the company's web server IP address
    a) 192.168.200.50
    b) 192.168.200.55
    c) 192.168.200.60
    d) 192.168.200.65

50. From the same list of DNS records, what is the host name of the authoritative DNS server for abc.com
    a) ad1.abc.com
    b) ns1.abc.com
    c) exch1.abc.com
    d) web1.abc.com

51. In a DNS resource record, the TTL or Time To Live field is for
    a) Determine when the record should go live
    b) Determine when the record should be remove from cache
    c) Determine when the record should be added to the cache
    d) Determine when the record should be updated

52. DNS can be subject to Man-in-middle and DNS poisoning attack, true or false
    a) True
    b) False

53. To reduce the number of bit use in a video or digital image, we can use spatial or temporal coding, true or false
    a) True
    b) False

54. In the statement below, which one describe a pure P2P architecture
    a) No always–on server, arbitrary host directly communicate, host are connected permanently and IP address are dynamic
    b) Always–on server, arbitrary host directly communicate, host are connected intermittently and IP address are static
    c) No always–on server, arbitrary host directly communicate, host are connected intermittently and IP address are dynamic
    d) Always–on server, host communicate to specific host, host are connected intermittently and IP address are dynamic

55. A major advantage of P2P architecture over Client-Server architecture is
    a) Simple management
    b) Self-scalability
    c) All files are centrally stored
    d) Complex management

56. In a BitTorrent, a technique that a peer will use to determine which chunk it should request first is call
    a) Rarest first
    b) Rarest last
    c) Newest first
    d) Newest first

57. A chunk in BitTorrent is define as a
    a) Fixed size file object
    b) Variable size file object
    c) A group of peers
    d) A group of files of variable length

58. In BitTorrent the size of a chunk is define to be
    a) 256 KBytes
    b) 512 KBytes
    c) 1024 KBytes
    d) 2048 Kbytes

59. For every _____ a peer in BitTorrent will re-evaluate its top-four peers
    a) 5 secs
    b) 10 secs
    c) 20 secs
    d) 30 secs

60. When a peer in BitTorrent randomly chose an additional peer other than the four peers that it is already exchanging chunk, what is the action call
    a) Pessimistically unchoked
    b) Pessimistically choked
    c) Optimistically unchoked
    d) Optimistically choked

End of Test