Instruction:

At the following URL: https://gaia.cs.umass.edu/kurose_ross/lectures.php, Select and listen to the following videos:

- Chapter 1, Section 1.1
- Chapter 1, Section 1.2
- Chapter 1, Section 1.3
- Chapter 1, Section 1.4
- Chapter 1, Section 1.5
- Chapter 1, Section 1.6
- Chapter 1, Section 1.7
- Chapter 2, Section 2.1
- Chapter 2, Section 2.2
- Chapter 2, Section 2.4
- Chapter 3, Section 3.1
- Chapter 4, Section 3.3
- Chapter 4, Section 3.5

Then at the midterm file, select and answer just ten of thirty questions.
Email at escajadillomunoa@rowan.edu and attach the file with the subject Midterm-CompNetwork until Wednesday, November 2, 2022, at 6:30 p.m.

CHAPTER Nº 1 – SECTION Nº 1

QUESTION Nº 01

Which of the following descriptions below correspond to a "nuts-and-bolts" view of the Internet? Select one or more of the correct answers below—[Hint: more than one of the answers below is correct].

A. A platform for building network applications.
B. A collection of billions of computing devices and packet switches interconnected by links.
C. A collection of hardware and software components executing protocols that define the format and the order of messages exchanged between two or more communicating entities, as well as the actions taken on the transmission and receipt of a statement or other event.
D. A "network of networks."
E. A place I go for information, entertainment, and to communicate with people.

ANSWER--->: B, C, D

QUESTION Nº 02

Which of the following descriptions below correspond to a "services" view of the Internet? Select one or more of the correct answers below—[Hint: more than one of the answers below is right].

A. A place I go for information, entertainment, and communication with people.
B. A collection of billions of computing devices and packet switches interconnected by links.
C. A collection of hardware and software components executing protocols that define the format and the order of messages exchanged between two or more communicating entities, as well as the actions taken on the transmission and receipt of a statement or other event.
D. A "network of networks."
E. A platform for building network applications

ANSWER--->: A, E

QUESTION Nº 03

Which human scenarios involve a protocol (recall: "Protocols define the format, order of messages sent and received among network entities, and actions taken on message transmission, receipt")? Select one or more answers below that are correct—Hint: more than one of the answers below is correct.

A. A student raises their hand to ask an insightful question, then the teacher acknowledges the student, listens carefully to the question, and responds with a clear, insightful answer. And they were then thanking the student for the question since teachers love to get questions.
B. A person is reading a book.
C. Two people introduce themselves to each other.
D. One person asking and getting the time to/from another person.
E. A person is sleeping.

ANSWER--->: A, C, D

CHAPTER Nº 1 – SECTION Nº 2

QUESTION Nº 04

Match :

Question List		Answer List
Ethernet	( )	A. Wireless, up to 10's Kbps per device.
802.11 WiFi	( )	B. Wireless. Up to 10's Mbps per device.
Cable access network	( )	C. Wireless. 10's to 100's of Mbps per device.
Digital Subscriber Line	( )	D. Wired. Up to 10's to 100's of Mbps downstream per user.
4G cellular LTE	( )	E. Wired. Up to 10's of Mbps downstream per user.
		F. Wired. Up to 100's Gbps per link.
		G. Wired. Up to 1 Tbps per link.

ANSWER--->: F, C, D, E, B

QUESTION Nº 05

Which physical layer technologies have the highest transmission rate and lowest bit error rate in practice?

A. 802.11 WiFi Channel

B. Fiber optic cable

C. 4G/5G cellular

D. Satellite channel

E. Coaxial cable

F. Twisted pair (e.g., CAT5, CAT6)

ANSWER--->: B

CHAPTER Nº 1 – SECTION Nº 3

QUESTION Nº 06

Choose the following two definitions that make the correct distinction between routing and forwarding.

A. Routing is the local action of moving arriving packets from the router's input link to the appropriate router output link. At the same time, forwarding is the global action of determining the source-destination paths taken by packets.

B. Forwarding is the local action of moving arriving packets from the router's input link to the appropriate router output link. At the same time, routing is the global action of determining the source-destination paths taken by packets.

ANSWER--->: B

QUESTION Nº 07

Which of the characteristics below are associated with the technique of circuit switching? Select all correct answers—[Hint: more than one of the answers is right].

A. Frequency Division Multiplexing (FDM) and Time Division Multiplexing (TDM) are two approaches for implementing this technique.

B. Resources are used on demand, not reserved in advance.

C. This technique was the basis for telephone call switching during the 20th century and the beginning of this current century.

D. This technique is used on the Internet.

E. Reserves resources needed for a call from source to destination.

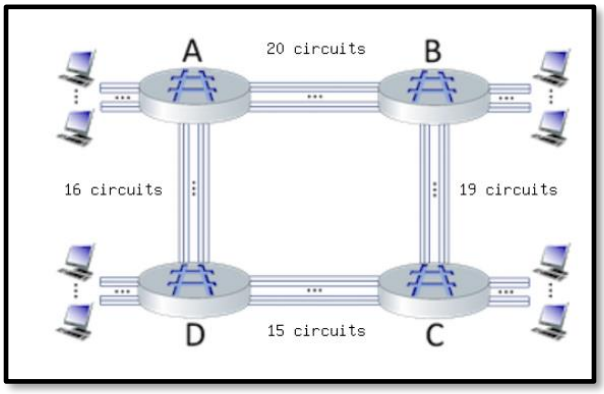
F. Data may be queued before transmission due to other users' data queueing for the message.

G. Congestion loss and variable end-end delays are possible with this technique.

ANSWER--->: A, C, E

QUESTION Nº 08

Consider the circuit-switched network shown in the figure below, with four circuit switches A, B, C, and D. Suppose there are 20 circuits between A and B, 19 circuits between B and C, 15 circuits between C and D, and 16 circuits between D and A.



What a maximum number of connections can be ongoing in the network at any time?

A. 70
B. 20
C. 31
D. 16
E. 39

ANSWER--->: A

QUESTION Nº 09

When we say that the Internet is a "network of networks," do we mean? Check all that apply (Hint: check two or more).

A. The Internet is the fastest network ever built.

B. The Internet comprises access networks at the edge, tier-1 at the core, and interconnected regional and content provider networks.

C. The Internet is made up of a lot of different networks that are interconnected to each other.

D. The Internet is the largest network ever built.

ANSWER--->: B, C

QUESTION Nº 10

Match:

Question List		Answer List
Each user generates traffic at an average rate of 2.1 Mbps, generating traffic at a rate of 15 Mbps when transmitting	( )	A. Packet switching
Each user generates traffic at an average rate of 2 Mbps, generating traffic at a rate of 2 Mbps when transmitting	( )	B. Circuit switching
Each user generates traffic at an average rate of 0.21 Mbps, generating traffic at a rate of 15 Mbps when transmitting	( )	C. Neither works well in this overload scenario

ANSWER--->: C, B, A

CHAPTER Nº 1 – SECTION Nº 4

QUESTION Nº 11

Match:

Question List		Answer List
Time needed to perform an integrity check, lookup packet information in a local table and move the packet from an input link to an output link in a router.	( )	A. Propagation delay
Time spent waiting in packet buffers for link transmission	( )	B. Queueing delay
Time spent transmitting packets bits into the link	( )	C. Transmission delay
Time need for bits to physically propagate through the transmission medium from end one of a link to the other	( )	D. Processing delay

ANSWER--->: D,B, C, A

CHAPTER Nº 1 – SECTION Nº 5

QUESTION Nº 12

Match

Question List		Answer List
Protocols that are part of a distributed network application	( )	A. Application Layer
Transfer of data between one process and another process (typically on different hosts)	( )	B. Physical layer
Delivery of datagrams from a source host to a destination host (typically).	( )	C. Network layer
Transfer of data between neighboring network devices	( )	D. Transport layer
Transfer of a bit into and out of a transmission media	( )	E. Link layer

ANSWER--->: A, D, C, E, B

QUESTION Nº 13

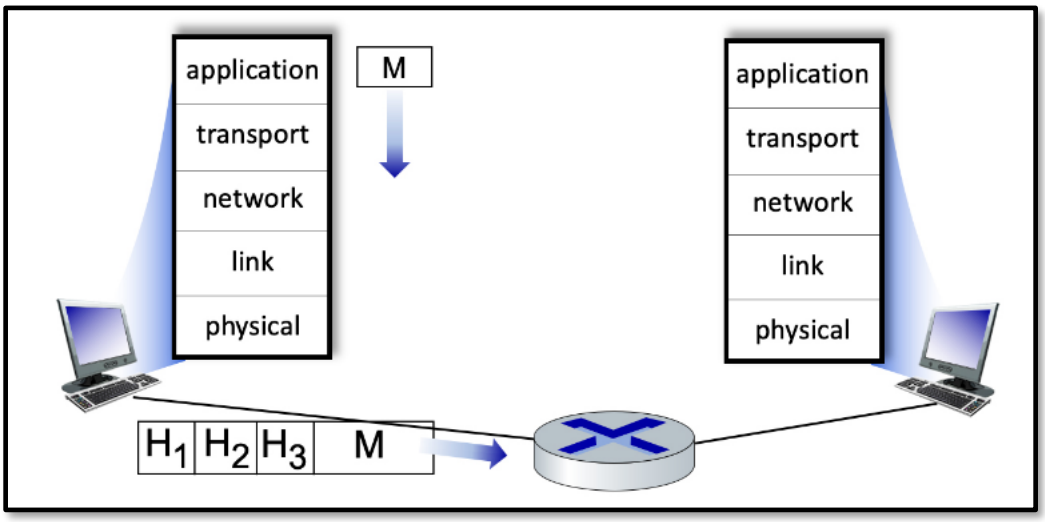
Match

Question List		Answer List
Application layer	( )	A. Message
Transport layer	( )	B. Frame
Network layer	( )	C. Segment
Link layer	( )	D. Bit
Physical layer	( )	E. Datagram

ANSWER--->: A, C, E, B, D

QUESTION Nº 14

The figure below shows a link-layer frame heading from a host to a router. There are three header fields shown. Match the name of a header with a header label displayed in the figure.



Question List		Answer List
Header H_1	( )	A. Transport layer
Header H_2	( )	B. Physical layer
Header H_3	( )	C. Network layer
		D. Link layer
		E. Application layer

ANSWER--->: D, C, A

QUESTION Nº 15

Which of the definitions below describe what is meant by the term "encapsulation"?

A. Computing the sum of all the bytes within a packet and placing that value in the packet header field.
B. Receiving a "packet" from the layer below, extracting the payload field, and possibly delivering that payload to an upper layer protocol after some internal actions.
C. Determining the name of the destination host, translating that name to an IP address, and then placing that value in a packet header field.
D. Starting a transport layer timer for a transmitted segment and then placing that segment in a retransmission queue if an ACK segment isn't received before the timeout.
E. Taking data from the layer above, adding header fields appropriate for this layer, and then placing the data in the payload field of the "packet" for that layer.

ANSWER--->: E

CHAPTER Nº 1 – SECTION Nº 6

QUESTION Nº 16

Match the description of a security defense with its name

Question List		Answer List
Specialized “middleboxes” filtering or blocking traffic, inspecting packet contents inspections	( )	A. Authentication
Provides confidentiality by encoding contents	( )	B. Encryption
Used to detect tampering/changing of message contents, and to identify the originator of a message	( )	C. Access control
Limiting use of resources or capabilities to given users	( )	D. Digital signatures
Proving you are who you say you are	( )	E. Firewall

ANSWER--->: E, B, D, C, A

CHAPTER Nº 1 – SECTION Nº 7

QUESTION Nº 17

Match the networking event with the time frame when the event occurred

Question List		Answer List
Early studies of packet switching by Baran, Davies, Kleinrock.	( )	A. 2010 - 2020
First ARPAnet node operational.	( )	B. 1990's
Internetting: DARPA researchers connect three networks together.	( )	C. 1970's
Internetting: DARPA researchers connect three networks together.	( )	D. 2000-2010
Congestion control is added to the TCP protocol	( )	E. Early 1960's
The WWW starts up (note: the WWW design started at the end of previous decade).	( )	F. Late 1980's
Software-defined networking begins	( )	G. Late 1960's
The number wireless Internet-connected devices	( )	H. Early 1980's

ANSWER--->: E, G, C, H, F, B, D, A

CHAPTER Nº 2 – SECTION Nº 1

QUESTION Nº 18

Which characteristics are associated with a client-server approach to structuring network applications (as opposed to a P2P system)?

A. A process requests service from its contacts and will assist with processes that contact it.

B. There is a server that is always on.

C. There is a server with a well-known server IP address.

D. There is no a server that is always on.

E. HTTP uses this application structure.

ANSWER--->: B, C, E

QUESTION Nº 19

Which characteristics are associated with a P2P approach to structuring network applications (as opposed to a client-server system)?

A. HTTP uses this application structure.
B. A process requests service from its contacts and will provide service to processes that contact it.
C. There is no a server that is always on.
D. There is a server that is always on.
E. There is a server with a well-known server IP address.

ANSWER--->: C, B

QUESTION Nº 20

When an application uses a UDP socket, what transport services are provided to the application by UDP? Check all that apply.

A. Flow Control. The provided service will ensure that the sender does not send so fast as to overflow receiver buffers.
B. Real-time delivery. The service guarantees that data will be delivered to the receiver within a specified time.
C. Congestion control. The service will control senders so that the senders do not collectively send more data than links in the network can handle.
D. Throughput guarantee. The socket can be configured to provide a minimum throughput guarantee between the sender and receiver.
E. Best effort service. The service will make the best effort to deliver data to the destination but makes no guarantees that any particular segment of data will get there.
F. Loss-free data transfer. The service will reliably transfer all data to the receiver, recovering from packets dropped in the network due to router buffer overflow.

ANSWER--->: E

QUESTION Nº 21

When an application uses a TCP socket, what transport services are provided to the application by TCP? Check all that apply.

A. Throughput guarantee. The socket can be configured to provide a minimum throughput guarantee between the sender and receiver.
B. Best effort service. The service will make the best effort to deliver data to the destination but makes no guarantees that any particular segment of data will get there.
C. Loss-free data transfer. The service will reliably transfer all data to the receiver, recovering from packets dropped in the network due to router buffer overflow.
D. Real-time delivery. The service guarantees that data will be delivered to the receiver within a specified time.
E. Flow Control. The provided service will ensure that the sender does not send so fast as to overflow receiver buffers.
F. Congestion control. The service will control senders so that the senders do not collectively send more data than links in the network can handle

ANSWER--->: C, E, F

CHAPTER Nº 2 – SECTION Nº 2

QUESTION Nº 22

What do we mean when we say "HTTP is stateless"? In answering this question, assume that cookies are not used. Check all answers that apply.

A. An HTTP client does not remember what happened during earlier steps in interacting with any HTTP server.
B. An HTTP client does not remember the identities of the servers with which it has interacted.
C. We say this when an HTTP server is not operational.
D. An HTTP server does not remember anything about what happened during previous interactions with this HTTP client.
E. The HTTP protocol is not licensed in any country.

ANSWER--->: D

QUESTION Nº 23

What is an HTTP cookie used for?

A. A cookie is used to spoof client identity to an HTTP server.
B. A cookie is a code used by a client to authenticate a person's identity to an HTTP server.
C. Like dessert, cookies are used at the end of a transaction to indicate the end.
D. A cookie is a code used by a server, carried on a client's HTTP request, to access information the server had earlier stored about an earlier interaction with this Web browser. [Think about the distinction between a browser and a person.]
E. A cookie is a code used by a server, carried on a client's HTTP request, to access information the server had earlier stored about an earlier interaction with this person. [Think about the distinction between a browser and a person.]

ANSWER--->: D

QUESTION Nº 24

What is the purpose of the HTTP GET message?

A. The HTTP GET a web server sends a request message to a web client to get the identity of the web client.
B. The HTTP GET a web server sends a request message to a web client to get the subsequent request from the web client.
C. The HTTP GET a web client uses a request message to request a web server to send the requested object from the server to the client.
D. The HTTP GET a web client uses a request message to post an object on a web server.

ANSWER--->: C

QUESTION Nº 25

What is the purpose of the conditional HTTP GET request message?

A. To allow a server only to send the requested object to the client if the client is authorized to receive that object.
B. A server can send the requested object to the client if the client has never asked for that object before.
C. A server can only send the requested object to the client if the server is not overloaded.
D. To allow a server only to send the requested object to the client if this object has changed since the server last sent this object to the client.

ANSWER--->: D

CHAPTER Nº 2 – SECTION Nº 4

QUESTION Nº 26

Match the function of a server to a given type of DNS server in the DNS server hierarchy

Question List		Answer List
Provides authoritative hostname to IP mappings for organization's named hosts.	( )	A. DNS root servers
Replies to DNS query by local host, by contacting other DNS servers to answer the query.	( )	B. Authoritative DNS server
Responsible for a domain (e.g., *.com, *.edu); knows how to contact authoritative name servers.	( )	C. Local DNS server
Highest level of the DNS hierarchy, knows how to reach servers responsible for a given domain (e.g., *.com, *.edu).	( )	D. Top Level Domain (TLD)

ANSWER--->: B, C, D, A

CHAPTER Nº 3 – SECTION Nº 1

QUESTION Nº 27

Where is transport-layer functionality primarily implemented?

A. Transport layer functions are implemented primarily at the routers and switches in the network.

B. Transport layer functions are implemented primarily at the hosts at the "edge" of the network.

C. Transport layer functions are implemented primarily at each end of a physical link connecting one host/router/switch to another host/router/switch.

ANSWER--->: B

CHAPTER Nº 4 – SECTION Nº 3

QUESTION Nº 28

What are the principal components of the IPv4 protocol (check all that apply)?

A. IPv4 addressing conventions.

B. SDN controller protocols.

C. ICMP (Internet Control Message Protocol)

D. Packet handling conventions at routers (e.g., segmentation/reassembly)

E. Routing algorithms and protocols like OSPF and BGP.

F. IPv4 datagram format.

ANSWER--->: A, D, F

QUESTION Nº 29

What is meant by an IP subnet? (Check zero, one or more of the following characteristics of an IP subnet).

A. A set of devices all manufactured by the same equipment maker/vendor.

B. A set of devices with a standard set of leading high-order bits in their IP address.

C. A set of device interfaces that can physically reach each other without passing through an intervening router.

D. A set of devices always has a standard first 16 bits in their IP address.

ANSWER--->: B, C

CHAPTER Nº 4 – SECTION Nº 5

QUESTION Nº 30

In the US, which of the following services has been regulated by the Federal Communications Commission (FCC) going back to the 20th century?

A. Information services.

B. Telecommunication services.

C. Neither telecommunications services (broadly) nor information services; the FCC's jurisdiction are only on over-the-air (e.g., wireless) links.

D. Both telecommunications services and information services

ANSWER--->: B

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