



Course name: Computer Networks II

Exam number: Fall 2016

Course Code: CNE402

Exam Date: Nov 2016

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Time Allowed: 60 minutes

ID:

Name:

Essay	MCQ	Total



Which of the following protocols are examples of TCP/IP transport layer protocols? a. Ethernet b. HTTP c. IP d. UDP e. SMTP f. TCP g. PPP	D and F
Which of the following protocols are examples of TCP/IP network interface layer protocols? a. Ethernet b. HTTP c. IP d. UDP e. SMTP f. TCP g. PPP	A and G
Which OSI layer defines the functions of logical network-wide addressing and routing? a. Layer 1 b. Layer 2 c. Layer 3 d. Layer 4 e. Layer 5 f. Layer 6 g. Layer 7	C
Which OSI layer defines the standards for cabling and connectors? a. Layer 1 b. Layer 2 c. Layer 3 d. Layer 4 e. Layer 5 f. Layer 6 g. Layer 7	A
Which OSI layer defines the standards for data formats and encryption? a. Layer 1 b. Layer 2 c. Layer 3 d. Layer 4 e. Layer 5 f. Layer 6 g. Layer 7	F

<p>Which of the following terms are not valid terms for the names of the seven OSI layers?</p> <ul style="list-style-type: none"> a. Application b. Data link c. Transmission d. Presentation e. Internetwork f. Session 	<p>C and E</p>
<p>The process of HTTP asking TCP to send some data and make sure that it is received correctly is an example of what?</p> <ul style="list-style-type: none"> a. Same-layer interaction b. Adjacent-layer interaction c. The OSI model d. All of the above e. None of the above 	<p>B</p>
<p>The process of TCP on one computer marking a segment as segment 1, and the receiving computer then acknowledging the receipt of segment 1, is an example of what?</p> <ul style="list-style-type: none"> a. Data encapsulation b. Same-layer interaction c. Adjacent-layer interaction d. The OSI model e. None of the above 	<p>B</p>
<p>The process of a web server adding a TCP header to a web page, followed by adding a TCP header, then an IP header, and then data link header and trailer is an example of what?</p> <ul style="list-style-type: none"> a. Data encapsulation b. Same-layer interaction c. The OSI model d. All of the above e. None of the above 	<p>A</p>
<p>Which of the following terms is used specifically to identify the entity that is created when encapsulating data inside data-link headers and trailers?</p> <ul style="list-style-type: none"> a. Data b. Chunk c. Segment d. Frame e. packet f. None—there is no encapsulation by the data link layer 	<p>D</p>

1. Name the seven layers of the OSI model.

Answer: Application (Layer 7), presentation (Layer 6), session (Layer 5), transport (Layer 4), network (Layer 3), data link (Layer 2), and physical (Layer 1). Some mnemonics to help you recall the names of the layers are: All People Seem To Need Data

Processing (Layers 7 to 1), Please Do Not Take Sausage Pizzas Away (Layers 1 to 7), and the ever-popular Pew! Dead Ninja Turtles Smell Particularly Awful (Layers 1 to 7).

2. What is the main purpose(s) of Layer 7?

Answer: Layer 7 (the application layer) provides standardized services to applications. The definition for this layer is typically ambiguous because it varies. The key is that it does not define a user interface, but instead it is a sort of toolbox used by application developers. For example, a web browser is an application that uses HTTP, as defined as a TCP/IP application layer protocol, to transfer the contents of web page between a server and client.

3. What is the main purpose(s) of Layer 6?

Answer: Layer 6 (the presentation layer) defines data formats, compression, and possibly encryption.

4. What is the main purpose(s) of Layer 5?

Answer: Layer 5 (the session layer) controls the conversation between two endpoints. Although the term used is session, the term conversation more accurately describes what is accomplished. The session layer ensures that not only communication, but also useful sets of communication between endpoints is accomplished.

5. What is the main purpose(s) of Layer 4?

Answer: Layer 4 (the transport layer) provides end-to-end error recovery, if requested.

6. What is the main purpose(s) of Layer 3?

Answer: Layer 3 (the network layer) defines logical addressing and routing as a means of delivering data across an entire network. IP and IPX are two examples of Layer 3–equivalent protocols.

7. What is the main purpose(s) of Layer 2?

Answer: The data link layer defines addressing specific to a particular medium as part of the means of providing delivery of data across that medium. It also includes the protocols used to determine what device(s) accesses the media at any point in time.

8. What is the main purpose(s) of Layer 1?

Answer: Layer 1 (physical layer) is responsible for encoding energy signals onto the medium and interpreting a received energy signal. Layer 1 also defines the connector and cabling details.

9. Describe the process of data encapsulation as data is processed from creation until it exits a physical interface to a network. Use the OSI model as an example.

Answer: Data encapsulation represents the process of a layer adding a header (and possibly a trailer) to the data as it is processed by progressively lower layers in the protocol specification. In the context of OSI, each layer could add a header so that—other than the true application data—there would be six other headers (Layers 2 to 7) and a trailer for Layer 2, with this L2PDU being encoded by the physical layer onto the network media.

10. Name three benefits to layering networking protocol specifications.

Answer: Some examples of benefits to layering networking protocol specifications include reduced complexity, standardized interfaces, modular engineering, interoperable technology, accelerated evolution, and simplified teaching and learning. Questions such as this on the exam require some subjective interpretation of the wording on your part.

11. which header or trailer does a router discard as a side effect of routing? And why?

Answer: A router discards the data-link header and trailer as a side effect of routing.

This

is because the network layer, where routing is defined, is interested in delivering the network layer (Layer 3) PDU from end to end. Routing uses intermediate data links (Layer 2) to transport the data to the next routers and eventually to the true destination.

The data-link header and trailer are useful only to deliver the data to the next router or

host, so the header and trailer are discarded by each router.

12. What OSI layer typically encapsulates using both a header and a trailer?

Answer: The data link layer typically encapsulates using both a header and a trailer.

The

trailer typically includes a frame check sequence (FCS), which is used to perform error detection.

13. What terms are used to describe the contents of the data encapsulated by the data link,

network, and transport layers, respectively?

Answer: Frame, packet, and segment, respectively.

14. Explain the meaning of the term L5PDU.

Answer: PDU stands for protocol data unit. A PDU is the entity that includes the headers and trailers created by a particular networking layer, plus any encapsulated data. For instance, an L5PDU includes Layer 5 headers and the encapsulated data.

15. Explain how Layer x on one computer communicates with Layer x on another computer.

Answer: Each layer of a networking model works with the same layer on another computer with which it wants to communicate. The protocol defined by each layer uses a header that is transmitted between the computers to communicate what each computer wants to do.

16. List the terms behind the acronym TCP/IP.

Answer: Transmission Control Protocol and Internet Protocol.

17. List the terms behind the acronym OSI.

Answer: Open Systems Interconnection.

<p>Which of the following best describes the main function of OSI Layer 1 protocols?</p> <ul style="list-style-type: none"> a. Framing b. Delivery of bits from one device to another c. Addressing d. CSMA/CD e. Defining the size and shape of Ethernet cards 	B
<p>2. Which of the following are part of the functions of OSI Layer 2 protocols?</p> <ul style="list-style-type: none"> a. Framing b. Delivery of bits from one device to another c. Addressing d. Error detection e. Defining the size and shape of Ethernet cards 	A
<p>Which of the following is true about Ethernet crossover cables?</p> <ul style="list-style-type: none"> a. Pins 1 and 2 are reversed on the other end of the cable. b. Pins 1 and 2 connect to pins 3 and 6 on the other end of the cable. c. Pins 1 and 2 connect to pins 3 and 4 on the other end of the cable. d. The cable can be up to 1000 m to cross over between buildings. e. None of the above. 	B
<p>Which of the following are true about the format of Ethernet addresses?</p> <ul style="list-style-type: none"> a. Each manufacturer puts a unique code into the first 2 bytes of the address. b. Each manufacturer puts a unique code into the first 3 bytes of the address. c. Each manufacturer puts a unique code into the first half of the address. d. The part of the address that holds this manufacturer's code is called the MC. e. The part of the address that holds this manufacturer's code is called the OUI. f. The part of the address that holds this manufacturer's code has no specific name. 	B, C, and E
<p>Which of the following is true about the Ethernet FCS field?</p> <ul style="list-style-type: none"> a. It is used for error recovery. b. It is 2 bytes long. c. It resides in the Ethernet trailer, not the Ethernet header. d. It is used for encryption. e. None of the above. 	C
<p>Which of the following fields can be used by Ethernet as a "type" field, to define the type of data held in the "data" portion of the Ethernet frame?</p> <ul style="list-style-type: none"> a. The DIX Ethernet DSAP field b. The IEEE 802.2 Ethernet Type field c. The IEEE 802.2 Ethernet DSAP field d. The SNAP header Protocol Type field e. None of the above. 	C and D
<p>Which of the following are true about the CSMA/CD algorithm?</p> <ul style="list-style-type: none"> a. The algorithm never allows collisions to occur. b. Collisions can happen, but the algorithm defines how the computers should notice 	B

<p>a collision and how to recover. c. The algorithm works only with two devices on the same Ethernet. d. None of the above.</p>	
<p>Which of the following would be a collision domain? a. All devices connected to an Ethernet hub b. All devices connected to an Ethernet switch c. Two PCs, with one cabled to a router Ethernet port with a crossover cable, and the other PC cabled to another router Ethernet port with a crossover cable. d. None of the above</p>	A
<p>With auto negotiation on a 10/100 card, what characteristics are negotiated if the device on the other end does not perform negotiation at all? a. 100 Mbps, half duplex b. 100 Mbps, full duplex c. 10 Mbps, half duplex d. 10 Mbps, full duplex</p>	C

1. What is the main purpose(s) of Layer 2?

Answer: The data link layer defines addressing specific to a particular medium as part of the means of providing delivery of data across that medium. It also includes the protocols used to determine what device(s) accesses the media at any point in time.

2. What is the main purpose(s) of Layer 1?

Answer: Layer 1 (the physical layer) is responsible for encoding energy signals onto the medium and interpreting a received energy signal. Layer 1 also defines the connector and cabling details.

3. What does MAC stand for?

Answer: MAC stands for Media Access Control.

4. Name three terms popularly used as a synonym for *MAC address*.

Answer: NIC address, card address, LAN address, hardware address, Ethernet address, Token Ring address, FDDI address, and burned-in address are all synonymous with MAC address. All of these names are used casually and in formal documents, and they refer to the same 6-byte MAC address concept as defined by IEEE.

5. What portion of a MAC address encodes an identifier representing the manufacturer of the card?

Answer: The first 3 bytes, called the Organizationally Unique Identified (OUI), comprise

the portion of a MAC address that encodes an identifier representing the manufacturer of the card.

10. If a Fast Ethernet NIC currently is receiving a frame, can it begin sending a frame?

Answer: Yes, if the NIC is operating in full-duplex mode.

11. What are the two key differences between a 10-Mbps NIC and a 10/100 NIC?

Answer: The obvious benefit is that the 10/100 NIC can run at 100 Mbps. The other benefit is that 10/100 NICs can autonegotiate both speed and duplex between itself and

the device that it is cabled to, typically a LAN switch.

12. What is the distance limitation of a single cable for 10BASE-T? For 100 BASE-TX?

Answer: 10BASE-T allows 100 m between the device and the hub or switch, as does

100

BASE-TX.

13. How fast is Fast Ethernet?

Answer: 100 million bits per second (100 Mbps).

14. How many bytes long is a MAC address?

Answer: 6 bytes long, or 48 bits.

16. Explain the function of the loopback and collision-detection features of an Ethernet NIC

in relation to half-duplex and full-duplex operations.

Answer: The loopback feature copies the transmitted frame back onto the receive pin on

the NIC interface. The collision-detection logic compares the received frame to the transmitted frame during transmission; if the signals do not match, a collision is occurring. With full-duplex operation, collisions cannot occur, so the loopback and collision-detection features are purposefully disabled, and concurrent transmission and

reception is allowed.