四川大学期末考试试题（闭卷）

（2018~2019 学年第 1 学期）　　A 卷

课程号：311105040　课程名称：计算机网络　任课教师：_____

适用专业年级：软件工程 2016 级　学号：_____　姓名：_____

考生承诺

我已认真阅读并知晓《四川大学考场规则》和《四川大学本科学生考试违纪作弊处分规定（修订）》，郑重承诺：

1、 已按要求将考试禁止携带的文具用品或与考试有关的物品放置在指定地点；

2、 不带手机进入考场；

3、 考试期间遵守以上两项规定，若有违规行为，同意按照有关条款接受处理。

考生签名：

题　　号	1(30%)	2(20%)	3(30%)	4(20%)
得　　分				
卷面总分		阅卷时间		

注意事项： 1. 请务必将本人所在学院、姓名、学号、任课教师姓名等信息准确填写在试题纸和添卷纸上；
2. 请将答案全部填写在本试题纸上；
3. 考试结束，请将试题纸、添卷纸和草稿纸一并交给监考老师。

评阅教师	得分

1. Multiple Choice (30 points, 1.5 points for each question)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

(1). Which of the following protocols is NOT an application protocol ? B

A. SMTP ✓
B. ICMP NETWORK.
C. FTP ✓
D. IMAP ✓

(2). In the following options, which does not define in protocol? D

A. the format of messages exchanged between two or more communicating entities
B. the order of messages exchanged between two or more communicating entities

C. the actions taken on the transmission of a message or other event

D. the transmission signals are digital signals or analog signals

(3). In the Internet, the equivalent concept to end systems is ____A____

A. Hosts

B. servers

C. clients

D. routers

(4). The Internet's network layer is responsible for moving network-layer packets known as ____B____from one host to another.

A. Frame

B. datagram

C. segment

D. message

(5). Which of the following protocol layers is not explicitly part of the Internet Protocol Stack? ____B____

A. application layer

B. Presentation layer

C. data link layer

D. transport layer

(6). There are two classes of packet-switched networks: ____D____networks and virtual-circuit networks.

A. Datagram

B. circuit-switched

C. television

D. telephone

(7). Processing delay does not include the time to ____B____

A. examine the packet's header

B. wait to transmit the packet onto the link

C. determine where to direct the packet

D. check bit-error in the packet

(8). The following technologies may be used for residential access, except ____D____.

A. A. HFC

B. DSL

C. Dial-up modem

D. FDDI

(9). An application can rely on the connection to deliver all its data without error and in the proper order. The sentence describes _____.

A. flow control

B. congestion-control

C. reliable data transfer

D. connection-oriented service

(10). There are three classes of DNS servers, there are _____ .

A. root DNS server, top-level domain DNS server and local DNS server

B. root DNS server, top-level domain DNS server and authoritative DNS server

C. root DNS server, local DNS server and authoritative DNS server

D. root DNS server, local DNS server and top-level domain DNS server

(11). Transport-layer protocols run in _____.

A. Servers

B. Clients

C. network edge

D. network core

(12). UDP offers which of the following benefits relative to TCP? _____

A. UDP consumes fewer computer resources by not maintaining connection state

B. UDP supports a self-regulating “throttle” feature that prevents network saturation

C. UDP guarantees that Individual packets of a transmission will arrive “in order”

D. None of the above

(13). In the following four descriptions about MSS and MTU, which one is not correct? _____

A. The MSS is the maximum amount of application-layer data in the segment

B. The MSS is the maximum size of the TCP segment including headers

C. The MSS is typically set by MTU

D. The MTU means the largest link-layer frame

(14). Which of the following devices performs Lay-2 switch? _____

A. switch

B. hub

C. router

D. repeater

(15). In the following four descriptions about random access protocol, which one is not correct? ____A____

A. In slotted ALOHA, nodes can transmit at random time.

B. CSMA/CD cannot be implemented on a wireless channel.

C. The maximum efficiency of a slotted ALOHA is higher than a pure ALOHA.

D. In CSMA/CD, one node listens to the channel before transmitting

(16). Let's assume there is 16-bit piece data 1111 1011 1001 1001, The 8-bit Internet checksum for this data should be ____A____

A. 01101010

B. 01101000

C. 10010101

D. 10010100

(17). For the data in (16), the CRC is applied to it with generator 1001. Thus the CRC bits should be ____D____

A. 110

B. 101

C. 100

D. 111

(18). Which of the following sub-network masks is illegal? ____A____.

A. 255.255.64.0

B. 255.255.128.0

C. 255.255.192.0

D. 255.255.224.0

(19). Which of the following services cannot be offered by a link-layer protocol? ____A____

A. congestion control

B. Link Access

C. Error control

D. Framing

(20). Which of the following four descriptions about MAC addresses is wrong? ____C____.

A. a MAC address is burned into the adapter's ROM

B. No two adapters have the same address

C. An adapter's MAC address is dynamic

D. A MAC address is a link-layer address

评阅教师	得分

2. True or False (20 points, 2 point for each statement)

1	2	3	4	5	6	7	8	9	10

F (1). The Date: header in the HTTP response message indicates when the object in the response was last modified.

F (2). TCP sends control information out of band

F (3). HTTP response messages never have an empty message body.

F (4). STMP is a stateless protocol.

T (5). There is no network congestion in a virtue circuit switching network.

T (6). Cookie is used to fix the stateless of HTTP.

F (7). Switches decrement the TTL field in the IP header.

F (8). Token Ring is an example of a contention-based MAC protocol.

F (9). Consider a link with a finite buffer. For a given buffer size and a packet arrival rate, the probability of packet loss is independent of the service rate.

F (10). BGP exchanges link weights.

评阅教师	得分

3. please answer following questions briefly (30 points).

(1) The client A wants to request a Web page from Server B. Please answer the following questions briefly, according to the time-sequence diagram shown in figure 1.

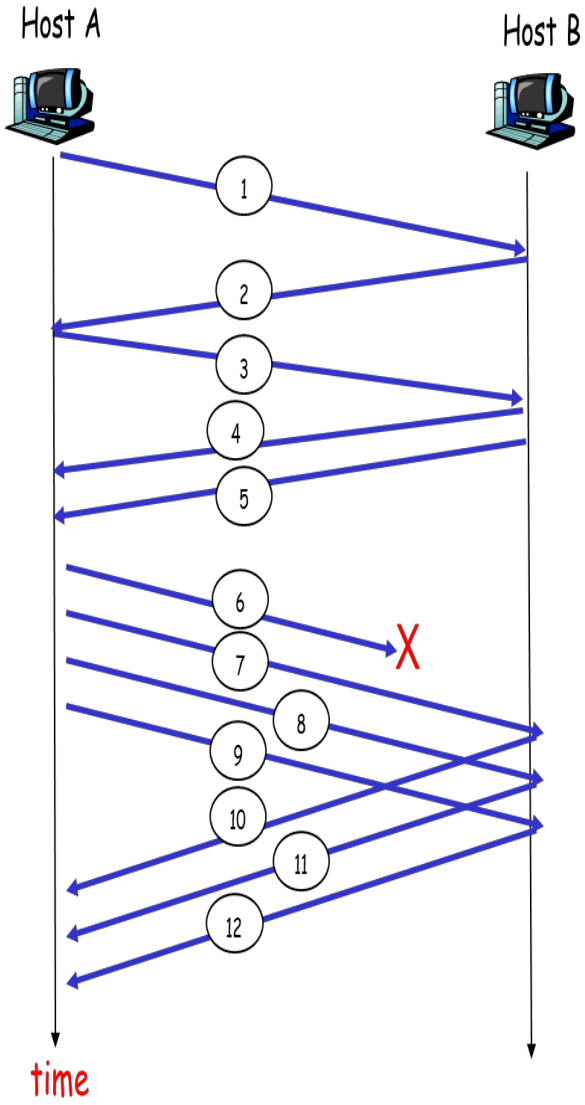

Figure 1.

a) What are the values of SYN bit and ACK bit in segment 1 respectively? (2 points)

b) What are the values of SYN bit and ACK bit in segment 2 respectively? (2 points)

c) Let's assume the sequence number of segment 1 is 90 and the sequence number of segment 2 is 200. What are the values of the sequence number and the acknowledge number of segment 3, respectively? (2 points)

d) Which segment the HTTP request message is carried in? (1 point)

e) Give a reason why A received two segments (segment 4 and segment 5) continuously, whereas only sending one segment (segment 3)? (1 point)

f) At least how many web objects are embedded in this web page? (1 points)

g) After receiving segment 12, how many web objects embedded in this web page have been received by A? (1 points)

(2) Suppose nodes A and B are on the same 100 Mbps Ethernet bus, and the propagation delay between the two nodes is 300 bit times. Suppose both A and B attempt to send frames at time t=0. Please answer the following questions

a) What time A detects the collision? (2 points)

b) What time A complete transmitting the jam signal? (2 points)

c) Let's assume A select K=0 to perform the binary exponential backoff, what time A start retransmitting? (2 points)

d) Further assume B select K=1 to perform the binary exponential backoff, what time B start to sense the channel? (2 points)

e) Will the collision happen in this transmission? Justify your answer (2 points)

(3) Consider the network with 4 routers in figure 1, with link cost labeled. Assume that a distance vector algorithm with poisoned reverse is used. Assume that each node initially knows only the costs to their neighbors. Assume that the DV algorithm works in a synchronous manner, where all nodes simultaneously receive distance vectors from their neighbors, compute their new distance vectors, and inform their neighbors if their distance vectors have changed.

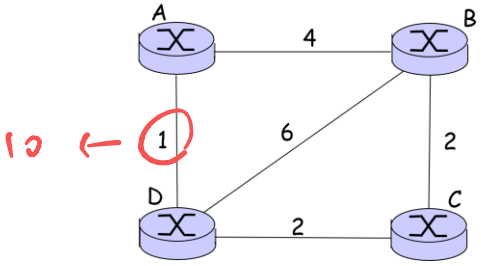

Figure 2.

a) Please show the distance entries at the node A (4 points).

b) After the DV algorithm converged, the link cost between node A and node D increases from 1 to 10. Once detecting this change, node D has to update its distance vector and inform its new distance vector to C. What's this new distance vector D sends to C?(2 points)

c) As soon as C received D's update, C will recalculate its own distance vector. If C has computed a new distance vector, C will inform D this new distance vector. Will C update its distance vector? If so, what's the new distance vector C will send to D?.(3 points)

d) Let's assume that the network in Figure. 1 is an autonomous system in the Internet with AS number 0. Node A is the BGP gateway of this AS. Is A the only router in this network that runs BGP and DV algorithm simultaneously? (1 point).

评阅教师	得分

4. Analysis (20 points)。

1) Consider the network shown below (figure 3), There are one router, 4 switches, and 11 hosts. Suppose all the switch table on all switches and all the ARP tables on all nodes are empty initially.

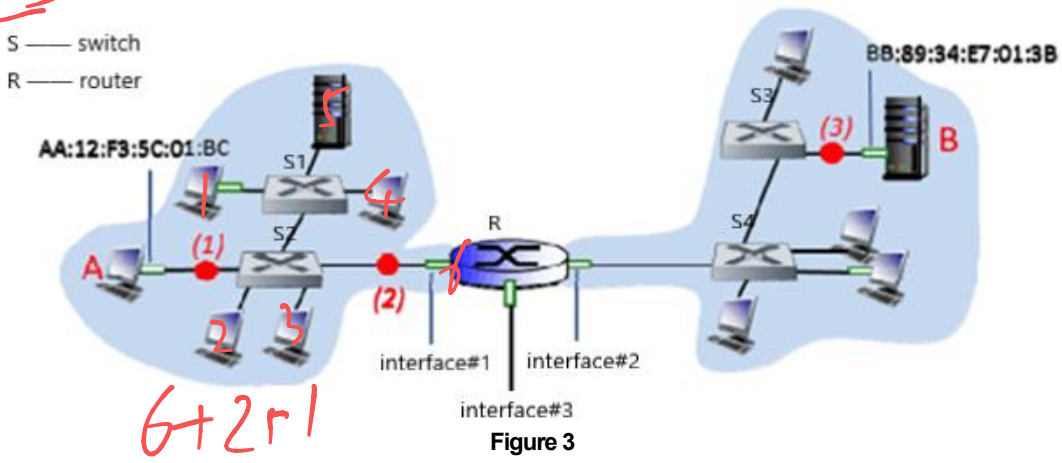

Figure 3

a) Let's assume that the IP address of R's interface #1 is 202.115.32.1 and the IP address of R's interface #2 is 202.115.32.65. Please assign IP address ranges to the subnets containing hosts A and B, and assign IP addresses in these ranges to hosts A and B. Your subnet addressings should use the smallest amount of address space. (4 points)

b) What IP address range can the router advertise to the outside for all of the hosts reachable in these two subnets? (2 points)

c) Consider a datagram being sent from A to B, ARP queries are needed due to the empty ARP table of A. How many of the 11 hosts in the network receive the ARP query sent by A? Explain your answer briefly. (2 points)

d) After completing the ARP query, A can send the datagram to B. How many of the 11 hosts in the network receive the frame containing the datagram sent by A? Explain your answer briefly. (2 points)

e) Consider an IP datagram being sent from A to B using Ethernet as the link layer protocol in all links in the figure above. What are the (i) Ethernet source and destination addresses and (ii) IP source and destination addresses of the IP datagram encapsulated within the Ethernet frame at points (1), (2), and (3) in the above example for a datagram going from A to B (10 points)

Packet at (1)

Source MAC	*Destination MAC*	*Source IP*	*Destination IP*
A's MAC	R#1's MAC	A's IP	B's IP

Packet at (2)

Source MAC	*Destination MAC*	*Source IP*	*Destination IP*
A's MAC	R#1's MAC	A's IP	B's IP

Packet at (3)

Source MAC	*Destination MAC*	*Source IP*	*Destination IP*
R#2's MAC	B's MAC	A's IP	B's IP