厦门大学《 计算机网络 》课程试卷

_软件_ 学院 _软件工程_ 系 _2017_ 年级 _软件工程_ 专业

学年学期：18-19/2 主考教师：林坤辉;黄炜 A 卷(√)B 卷( )

一、单选题（共 20 分，每小题 1 分。按顺序每行 5 题，分 4 行将答案写在答卷纸上）

1. Which of the following transmission media does RJ45 used?

    A. shielded twisted pair

    B. unshielded twisted pair

    C. coaxial cable

    D. optical fiber

2. The RS-232 standard sends each bit of the character, and follows each character with an idle period _____ bit(s) long.

    A. no

    B. one

    C. at least one

    D. at most one.

3. Which of following problems needs to be considered in the data link layer?

    A. Bit encoding and decoding.

    B. Error control.

    C. Datagram fragmentation.

    D. Out of order receipt of packets.

4. ASDL which divides available bandwidth uses _____ division multiplexing.

    A. time

    B. wave

    C. code

    D. frequency

5. A host uses _____ when starting up and requesting a dynamic IP address.

    A. unicast

    B. multicast

    C. broadcast

    D. none of above

6. The mechanism of _____ created to establish label switched paths was so cumbersome that it was not used.

    A. ARPANET

    B. ATM

    C. Frame relay

    D. X. 25

7. An organization usually chooses to place a _____ on each floor of a building.

    A. hub

    B. repeater

    C. switch

    D. bridge

8. Which of the following can be a source address of an IP datagram?

    A. 0.0.0.0

    B. 218.193.0.0

    C. 224.1.0.2

    D. 255.255.255.255

9. Which of the following fields is NOT valid in the IPv4 datagram header?

    A. Source IP

    B. Identification

    C. Acknowledgement

    D. Time to live

10. The mask _____ is assigned to a subnet 218.193.0.0/27.

    A. 255.255.255.224

    B. 31.255.255.255

    C. 255.255.0.0

    D. 218.193.0.31

11. Which of the following statements about WAN store and forward is TRUE?

    A. A system that uses the store and forward paradigm can keep each data link busy, and thus, decrease overall performance.

    B. The forward operation occurs when a packet arrives: I/O hardware inside the packet switch places a copy of the packet in memory.

    C. The store operation occurs once a packet has arrived and is waiting in memory.

    D. The processor examines the packet, determines its destination, and sends the packet over the I/O interface that leads to the destination.

12. Pinging _____ with all packets received successfully CANNOT tell the network interface card is working properly.

    A. 0.0.0.0   ·   B. 127.0.0.255   C. 192.168.1.0   D. 255.255.255.255

13. TCP DOES NOT guarantee that the data sent across a connection will be _____.

    A. delivered exactly as sent   B. delivered completely

    C. delivered in same size pieces   D. delivered in order

14. Each entry in a _____ advertisement consists of a pair (destination network, distance).

    A. RIP   B. OSPF   C. IS-IS   D. BGP

15. Which statement DOES NOT characterize the transport layer protocols?

    A. TCP and UDP port numbers are used by application layer protocols.

    B. TCP uses port numbers to provide reliable transportation of IP packets.

    C. TCP uses windowing and sequencing to provide reliable transfer of data.

    D. TCP is a connection-oriented protocol. UDP is a connectionless protocol.

16. FTP can be characteristized as:

    A. Clients can transfer files but they cannot obtain the contents of a directory.

    B. Control messages can be sent as either ASCII text or non-ASCII character.

    C. FTP allows each file to have ownership and access restrictions.

    D. If the FTP server is running on UNIX and a client on Windows is used to download a binary file, a file format error occurs.

17. When a host cannot resolve a domain, a request message will be sent to _____ server.

    A. local   B. authority   C. top level   D. root

18. During an e-mail is received from the server, _____ is NOT engaged.

    A. DNS   B. IP   C. POP3/IMAP4   D. SMTP

19. The status code 200 means _____ for HTTP.

    A. redirection   B. internal error   C. not found   D. OK

20. IPv4 address exhaustion is one of the motivation of IPv6, _____ and _____ overcomes such shortage and extends the life of IPv4.

    A. CIDR; NAT   B. CDMA; CSMA   C. DHCP; ARP   D. ARP; DNS

二、简答题（共 30 分，每小题 6 分。答案写在答卷纸上，并标明题号）

1. 请作图画出载波、信号（发送的位为：1011）、调频、调幅、调相的三种载波，共 5 幅图。图应标明横轴纵轴，主要特征应明显。

2. TCP/IP 协议族的网络接口层已定义帧格式和物理地址，为何网络层需要定义 IP 报文格式并使用唯一的 IP 地址？

3. RIP（路由信息协议）使用何种传输层协议？请简述其工作原理。

4. 请说明 TranceRouter 程序用 ICMP 报文探测从源到目标中间路由器 IP 地址的机制。

5. 请简述 TCP 协议中流量控制机制，并指出流量控制与拥塞控制的区别。

三、应用题（共 50 分。答案写在答卷纸上，并标明题号）

1. （25 分）某公司的网络拓扑如图 1 所示。其中，路由器 3 台，连接 C 类网络 4 个，其物理网络类型各不相同。N1 为传统以太网。R1 的 IP 为 192.168.1.1 和 192.168.2.1，R2 的 IP 为 192.168.2.2 和 192.168.3.1，R3 的 IP 为 192.168.3.2 和 192.168.4.1。
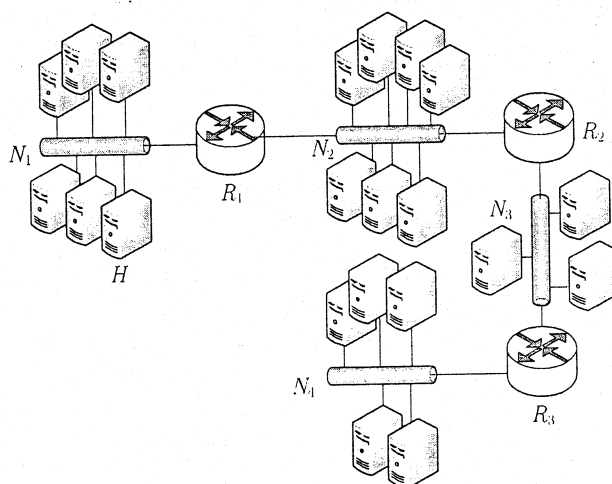

图 1 某公司网络拓扑图

（1）（4分）图中 N1 现使用共享型 Hub 连接计算机，这样做有什么缺点？其联网设备如何改进？请画出改进后的拓扑结构示意图，并简要说明理由。

（2）（5分）请作图说明传统以太网的帧结构，标注每段含义和长度（或长度范围）。请根据传统以太网的介质访问控制策略，说明信号冲突后的处理机制。

（3）（5分）设主机 H 向 N4 中的某主机发送一个 IP 数据报，其在主机 H 和 R1 中分别需要做哪些处理。

（4）（5分）请写出路由器 R2 的路由表，包括：目的地，子网掩码，下一跳，跳数。

（5）（6分）N1 的 MTU（最大传输单元）为 1500B，N2 的 MTU 为 800B，N3 的 MTU 为 1200B，N4 的 MTU 为 600B。从主机 192.168.1.4 向主机 192.168.4.4 发送一个 1800B 的 IP 报文（其中 IP 头长度为 20B）。请写出该 IP 报文在 N4 中的每个分片的报文总长度及其偏移量。请写出这些报文分片重组的位置和条件。

2. （12分）现需要设计一个基于 SocketAPI 的网络通信软件。

（1）（3分）如何唯一标识网间通信的两端进程？

（2）（5分）请用伪代码列出流模式下通信双方 SocketAPI 函数调用流程（应正确写出 Windows 或 UNIX 下的函数名）。

（3）（4分）请说明并发的 Server 端基本操作流程。

3. （13分）学生在宿舍用电信宽带通过 Chrome 浏览器登陆我校选课系统选课。

（1）（5分）浏览器是否能通过 ARP 询问选课网站的 MAC 地址？并说明原因。

（2）（6分）HTTP 协议基于 TCP 连接，TCP 在建立和终止时使用了握手过程。请分别作图说明其交互过程。请注明重要的头标志。

（3）（2分）由于访问量的激增，学生反映 Web 服务打开网页太慢，请提出 2 个改善用户体验的可行办法（除了购买高配置服务器、增加带宽之外）。