分组1

1. In the following options, which does not define in protocol? (1.0分)

- 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

2. In the following options, which is defined in protocol?(1.0分)

- √ A.the actions taken on the transmission and/or receipt of a message or other event
- B.the objects exchanged between communicating entities
- C.the content in the exchanged messages
- D.the location of the hosts

3. Which of the following nodes belongs to the network core?(1.0分)

- A.a Web Server
- B.a Host with Win2003 Server
- √ C.a Router with NAT service
- D.a Supernode on Skype Network

4. In the Internet, the equivalent concept to end systems is ( )(1.0分)

- √ A.hosts
- B.servers
- C.clients
- D.routers

5. In the Internet, end systems are connected together by ( )(1.0分)

- A.copper wire
- B.coaxial cable
- √ C.communication links
- D.fiber optic

6. End systems access to the Internet through its ( )(1.0分)

- A.modems
- B.protocols
- √ C.ISP
- D.sockets

7. In the following options, which belongs to the network core?(1.0分)

- A.end systems
- √ B.routers
- C.clients
- D.servers

8. End systems, packet switches, and other pieces of the Internet, run ( ) that control the sending and receiving of information within the Internet.(1.0分)

- A.programs
- B.processes
- C.applications
- √ D.protocols

9. The protocols of various layers are called ( ).(1.0分)

- √ A.the protocol stack
- B.TCP/IP
- C.ISP
- D.network protocol

10. In the OSI reference model, the upper layers of the OSI model are, in correct order(1.0分)

- A.

  Session, application, presentation

- B.Session, presentation, application
- C.

  <!--[endif]-->Session, application, presentation, physical

√ D.Application, presentation, session

11. The lower layers of the OSI model are, in correct order(1.0分)

A.physical, system, network, logical
B.physical, logical, network, system
C.physical, transport, network, data link
√ D.physical, data link, network, transport

12. Which of the following protocol layers is not explicitly part of the Internet Protocol Stack?(1.0分)

A. application layer
√ B.session layer
C.data link layer
D.transport layer

13.

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

(1.0分)

A.frame
√ B.datagram
C.segment
D.message

14. Transport-layer packets are called:(1.0分)

A.message
√ B.segment
C.datagram
D.frame

15.

The units of data exchanged by a link-layer protocol are called ( ).

(1.0分)

√ A.Frames
B.Segments
C.Datagrams
D.bit streams

16.

There are two fundamental approaches to building a network core, ( ) and packet switching.

(1.0分)

A.electrical current switching
√ B.circuit switching
C.data switching
D.message switching

17.

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

(1.0分)

√ A.datagram
B.circuit-switched
C.television
D.telephone

18. ( ) means that the switch must receive the entire packet before it can begin to transmit the first bit of the packet onto the outbound link.

(1.0分)

√ A.Store-and-forward transmission
B.FDM
C.End-to-end connection
D.TDM

19.

In ( ) networks, the resources needed along a path to provide for communication between the end system are reserved for the duration of the communication session.

(1.0分)

- A.packet-switched
- B.data-switched
- ✓ C.circuit-switched
- D.message-switched

20.

In ( ) networks, the resources are not reserved; a session's messages use the resources on demand, and as a consequence, may have to wait for access to communication link.

(1.0分)

- ✓ A.packet-switched
- B.data-switched
- C.circuit-switched
- D.message-switched

21. Which of the following option belongs to the circuit-switched networks?(1.0分)

- A.FDM
- B.TDM
- C.VC networks
- ✓ D.both A and B

22.

In a circuit-switched network, if each link has *n* circuits, for each link used by the end-to-end connection, the connection gets ( ) of the link's bandwidth for the duration of the connection.

(1.0分)

- ✓ A.a fraction 1/*n*
- B.all
- C.1/2
- D.n times

23. For ( ), the transmission rate of a circuit is equal to the frame rate multiplied by the number of bits in a slot.(1.0分)

- A.CDMA
- B.packet-switched network
- ✓ C.TDM
- D.FDM

24.

The network that forwards packets according to host destination addresses is called ( ) network.

(1.0分)

- A.circuit-switched
- B.packet-switched
- C.virtual-circuit
- ✓ D.datagram

25. The time required to propagate from the beginning of the link to the next router is ( ).(1.0分)

- A.queuing delay
- B.processing delay
- ✓ C.propagation delay
- D.transmission delay

26.

Processing delay does not include the time to ( ).

(1.0分)

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

27. In the following four descriptions, which one is correct? (1.0分)

A.The traffic intensity must be greater than 1.
B.The fraction of lost packets increases as the traffic intensity decreases.
✓ C.If the traffic intensity is close to zero, the average queuing delay will be close to zero.
D.If the traffic intensity is close to one, the average queuing delay will be close to one.

28.

Suppose, *a* is the average rate at which packets arrive at the queue, *R* is the transmission rate, and all packets consist of *L* bits, then the traffic intensity is ( )

(1.0分)

A.LR / a
✓ B.La / R
C.Ra / L
D.LR / a

29. Suppose there is exactly one packet switch between a sending host and a receiving host. The transmission rates between the sending host and the switch and between the switch and the receiving host are R_1 and R_2, respectively. Assuming that the switch uses store-and-forward packet switching, what is the total end-to-end delay to send a packet of length L? (Ignore queuing delay, propagation delay, and processing delay.) (1.0分)

✓ A.$L/R_1 + L/R_2$
B.L/R_1
C.L/R_2
D.none of the above

30. We are sending a 30 Mbit MP3 file from a source host to a destination host. Suppose there is only one link between source and destination and the link has a transmission rate of 10 Mbps. Assume that the propagation speed is $2 * 10^8$ meters/sec, and the distance between source and destination is 10,000 km. Also suppose that message switching is used, with the message consisting of the entire MP3 file. How many bits will the source have transmitted when the first bit arrives at the destination?(1.0分)

A.1 bit
B.30,000,000 bits
✓ C.500,000 bits
D.none of the above

31. Access networks can be loosely classified into three categories: residential access, company access and ( ) access.(1.0分)

A.cabled
✓ B.wireless
C.campus
D.city area

32. The following technologies may be used for residential access, except(1.0分)

A.HFC
B.DSL
C.Dial-up modem
✓ D.FDDI

33. Which kind of media is not a guided media? (1.0分)

A.twisted-pair copper wire
B.a coaxial cable
C.fiber optics
✓ D.digital satellite channel

34. In the OSI reference model, what is the first layer from the bottom up to provide end-to-end services?(1.0分)

A.Data Link
✓ B.Transport
C.Session
D.Application

35. Considering the bursty data transferring, a circuit switching network outperforms a packet switching network.(2.0分)

A.True

✓ B.False

36. There is no network congestion in a circuit switching network(2.0分)

✓ A.True

B.False

37.

Consider an application that transmits data at a steady rate, and once this application starts, it will stay on for a relatively long period of time. According to the characteristic, a packet-switched network would be more appropriate for this application than a circuit-switched network.

(2.0分)

第一次作业（003） (总分: 100)

A.True

✓ B.False

38. Suppose a router has *n* input ports each with identical line speeds, *n* output ports each with identical line speeds, and the line speed of an output port is at least *n* times as that of an input port. Further suppose that the switching fabric speed is at least *n* times as fast as an input line speed. Then queuing can occur in an output port.(2.0分)

A.True

✓ B.False

39. How many layers are there in the Internet protocol stack? What are they? What are the principal responsibilities of each of these layers?(4.0分)

五个层次，分别是应用层、传输层、网络层、链路层、物理层。

应用层：网络应用程序及它们的应用层协议存留的地方。

运输层：在应用程序端点之间传送应用层的报文。

网络层：负责把称为数据报的网络层分组从一台主机转移到另一台主机。

链路层：负责将整个帧从一个网络元素移动到邻近的网络元素。

物理层：将该帧中的一个个bit从一个结点到下一个结点。

得分:4.0

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参考答案

收起

40. If the unit exchanged at the data link level is called a frame and the unit exchanged at the network level is called a packet, do frames encapsulate packets or do packets encapsulate frames? Explain your answer.(4.0分)

帧封装包，到包到达链路层时，将整个包当成是帧的数据区，即在整个包前面加上一个首部作为帧，所以是将整个包放入了帧中，即帧封装包。

得分:4.0

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参考答案

收起

41. When two applications communicate over the Internet, which one is the server? (4.0分)

等待与其它应用程序联系的应用程序称为服务器。

得分:4.0

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参考答案

收起

42. Explain in detail how ADSL works(4.0分)

非对称数字用户线路：上行速率和下行速率不对称，在电话线上产生三个信息通道，一个是高速的下行通道，供用户下载数据，一个是中速上行通道，最后一个是普通双向电话通道，三个通道可同时工作。ADSL采用高级的数字信号处理技术技术和新的算法压缩数据，使大量的信息得以在网上高速传输。非对称数字用户线路（ADSL，Asymmetric Digital Subscriber Line）业务是宽带接入技术中的一种，它利用现有的电话用户线，通过采用先进的复用技术和调制技术，使得高速的数字信息和电话语音信息在一对电话线的不同频段上同时传输，为用户提供宽带接入（从网络到用户的下行速率可达8Mbps、从用户到网络的上行速率可达1Mbps）的同时，维持用户原有的电话业务及质量不变。为了在电话线上分隔有效带宽，产生多路信道，ADSL调制解调器一般采用两种方法实现，频分多路复用(FDM)或回波消除(Echo Cancellation)技术。FDM在现有带宽中分配一段频带作为数据下行通道，同时分配另一段频带作为数据上行通道。下行通道通过时分多路复用(TDM)技术再分为多个高速信道和低速信道。同样，上行通道也由多路低速信道组成。而回波消除技术则使上行频带与下行频带叠加， 通过本地回波抵消来区分两频带。

得分:4.0

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参考答案

收起

43. What is circuit switching, and what are its chief characteristics? (4.0分)

在端系统间通信会话期间，预留端系统间通信沿路径所需资源的方式称为电路交换。特点如下：

独占性、实时性好、可靠性高。

得分:4.0
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参考答案

收起

44. In a packet switching system, how does a sender transfer a large file? (4.0分)

在包交换系统中，将一个报文分成若干段称之为包，包的大小可变，每一中包交换技术会定义包的最大尺寸。所以一个大的文件，会被分成小的片段发送出去。

得分:4.0
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参考答案

收起

45. Draw one diagram for FDM and one diagram for TDM and explain how they work and how they are different(4.0分)

FDM：频分复用，连接期间为每条连接专用一个频段，链路的频谱由跨越链路所创建的所有连接共享。

TDM：时分复用，时间被划分为固定区间的帧，每帧又被划分为固定数量的时隙，当一条链路创建连接时，网络在每个帧中为该连接指定一个时隙。

对于FDM，每条电路连续地得到部分的带宽。对于TDM，每条电路在短时间间隔中周期性地得到所有带宽。

得分:4.0
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收起

46. Consider an application that transmits data at a steady rate (for example, the sender generates an N-bit unit of data every k time units, where k is small and fixed). Also, when such an application starts, it will stay on for a relatively long period of time. Would a packet-switched network or a circuit-switched network be more appropriate for this application? Why? (4.0分)

电路交换更适合，因为传输速率已知，并且为长会话，不会造成太大浪费。在最坏的情况下，所有应用程序都通过一条链路传输数据，因为还未达到链路最大带宽所以不会发生拥堵，所以网络不需要拥塞控制机制。

得分:4.0
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收起

47. Give four types of delay along with an explanation of each.(4.0分)

处理时延：检查分组首部和决定该分组导向何处所需的时间，还包括其他因素，例如：检查bit差错所需时间。

排队时延：在队列中，分组在链路上等待传输的时的排队时间。

传输时延：所有分组bit推向链路所需的时间。

传播时延：该链路起点到路由器B传播所需的时间。

得分:4.0
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收起

48.

Consider sending a packet of 3000bits over a path of 5 links. Each link transmits at 1000bps. Queuing delays, propagation delay and processing delay are negligible.

(1) Suppose the network is a packet-switched datagram network and a connectionless service is used. Now suppose each packet has 200 bits of header. How long does it take to send the file?

(2) Suppose that the network is a circuit-switched network. Further suppose that the transmission rate of the circuit between source and destination is 200bps. Assuming 0.02s setup time and 200 bits of header appended to the packet, how long does it take to send the packet?

(8.0分)

（1）（3000 + 200）/1000 * 5 = 16s

（2）（3000 + 200）/200 + 0.02 = 16.2s

得分:8.0
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参考答案

收起

49.

Suppose two hosts, A and B, are separated by 10,000kilometers and are connected by a direct link of R=1Mbps. Suppose the propagation speed over the link is $2.5*10^8$ meters/sec. Consider sending a file of 400,000 bits from Host A to Host B.

a) How long does it take to send the file, assuming it is sent continuously?

b) Suppose now the file is broken up into 10 packets with each packet containing 40,000bits. Suppose that each packet is acknowledged by the receiver and the transmission time of an acknowledgment packet is negligible. Finally, assume that the sender cannot send a packet until the preceding one is acknowledged. How long does it take to send the file?

(8.0分)

（a）400000/1000000 + 10000000/2.5*10^8 = 0.44s

（b）（40000/1000000 + 10000000/2.5*10^8）* 10 = 0.8s

得分:4.0

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参考答案

收起

50.

Consider the traceroute output below

1 cs-gw (128.119.240.254) 1.009 ms

2 128.119.3.154 (128.119.3.154) 0.931 ms

3 border4-rt-gi-1-3.gw.umass.edu (128.119.2.194) 1.032 ms

4 acr1-ge-2-1-0.Boston.cw.net (208.172.51.129) 10.006 ms

3 / 3

5 agr4-loopback.NewYork.cw.net (206.24.194.104) 12.272 ms

6 acr2-loopback.NewYork.cw.net (206.24.194.62) 13.225 ms

7 pos10-2.core2.NewYork1.Level3.net (209.244.160.133) 12.218 ms

8 gige9-1-52.hsipaccess1.NewYork1.Level3.net (64.159.17.39) 13.081 ms

9 p0-0.polyu.bbnplanet.net (4.25.109.122) 12.716 ms

10 cis.poly.edu (128.238.32.126) 14.080 ms

Here, we display only the first round-trip delay (rather than three delays) for each

router.

a) Explain why the delays sometimes decrease from one router to the next. (4 points)

b) Which link has the largest delay? (2 points)

(6.0分)

（a）排队时延随时间变化，所以分组n发送到路由器n的往返时延实际上能够比分组n+1发送到路由器n+1的往返时延更长。

（b）9号路由器到10号路由器的线路时延最大。

得分:4.0

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