座位号_____ 专业_____ 学院_____ 学号_____ 姓名_____

（密封线内不答题）

诚信应考,考试作弊将带来严重后果！

华南理工大学期末考试

《Computer Networks》试卷 A

注意事项：1. 考前请将密封线内填写清楚；

2. 所有答案请直接答在试卷上；

3. 考试形式：闭卷；

4. 本试卷共 五 大题，满分 100 分， 考试时间 120 分钟。

题 号	一	二	三	四	五	总分
得 分						
评卷人						

I、 **Blank Filling(15 Points，1 Point/Blank)**

1. The commonest transmission media used in Local Area Network (LAN) is _____.
2. In OSI reference model, the lowest layer is _____layer.
3. Please list three traditional applications:_____, _____, _____.（2 Points）
4. The binary value of the decimal IP address 205.255.170.205 is_____._____._____._____（2 Points）
5. IPv6 address has _____ binary bits.
6. In TCP segment header, window size is decided by_____.
7. If you want to buy a network interface card (NIC), please list three factors to affect you_____,_____, _____.（3 Points）
8. In IPv4 address 193.168.125.0/30, meaning of 30 is: _____ _____.
9. The basic unit of bandwidth is_____, The basic unit of throughput is_____.（1 Point）
10. In protocol 3 of data link layer(DLL),in order to provide reliable transmission, PAR technology is adopted, PAR is abbreviation(缩写) of _____.
11. In a LAN which uses OSPF (Open Shortest Path First), suppose the bandwidth of a line is 100M, and then cost (metric) of the line is _____.

II、 Decide true or false(10 Points，1 Point/subject, True √，False×)

No.	1	2	3	4	5	6	7	8	9	10
Answer										

1. Throughput usually refers to actually measured bandwidth at a specific time of day.
2. PAP authentication in PPP is more secure than CHAP authentication.
3. BGP is a link-state routing protocol, so it has no routing-loop problem.
4. EUI-64 address can be produced via corresponding MAC address.
5. The field number of basic header of IPv6 packet is much more than that of IPv4 packet header.
6. Data can be transmitted more than 185 meters using Category 5 UTP.
7. Light through fiber has no attenuation(衰减), so data can be transmitted far away.
8. Split-horizon is used to avoid routing loop in distance vector protocol.
9. TCP is more reliable than UDP, but is more complex.
10. The function of Hop-limit in IPv6 packet header is same as that of TTL in IPv4 packet header.

III、 Make a choice(25 Points，1 Point/subject)

No.	1	2	3	4	5	6	7	8	9	10
Answer										
No.	11	12	13	14	15	16	17	18	19	20
Answer										
No.	21	22	23	24	25					
Answer										

1. What is the function of the session layer? _____

A. concerned with data structures and the negotiation of data transfer syntax
B. provides reliable transit of data across the physical layer
C. provides connectivity and path selection between two end systems
D. manages data exchange between presentation layer entities

2. Which statement best describes bridges and the way they make forwarding decisions? _____

A. they operate at OSI Layer 2 and use IP addresses to make decisions
B. they operate at OSI Layer 3 and use IP addresses to make decisions
C. they operate at OSI Layer 2 and use MAC addresses to make decisions
D. they operate at OSI Layer 3 and use MAC addresses to make decisions

3. What is the Organizational Unique Identifier (OUI)? _____

A. all hex digits of a MAC address
B. the first 6 hex digits of a MAC address
C. the last 6 hex digits of a MAC address
D. the prefix to all network device model numbers

4. Which of the following is the approximate number of hosts supported in a Class B unsubnetted network? _____

A. 254
B. 2024
C. 65 thousand
D. 16 million

5. Which address represents a multicast address? _____

A. 224.2.5.2
B. 172.31.128.255/18
C. 192.168.24.59/30
D. 5.255.255.255

6. Which of the following services did not use TCP? _____

A. HTTP
B. SMTP
C. SNMP
D. FTP

7. What does a Layer 2 switch do if it receives a frame with a destination MAC address that is not found in its MAC address table?_____

A. The frame is dropped.
B. The frame is addressed with a broadcast MAC address and sent out all ports.
C. The frame is sent out all ports except the receiving port.
D. An ARP request is sent out all ports except the receiving port.

8. Which command will test the loop back function on the NIC? _____

A. Ping 127.0.0.1
A. Telnet 127.0.0.1
B. Ping 127.0.0.0
C. Telnet 127.0.0.0

9. Switches that receive the entire frame before sending it, use what type of frame forwarding? _____

A. Cut-through
B. Receive and send
C. Copy and send
D. Store-and-forward

10. When is ARP used? _____

A. The destination IP address is unknown.
B. The destination MAC address is unknown.
C. The source IP address is unknown.
D. The source MAC address is unknown.

11. What is the result of executing the “erase startup-config” command?_____

A. It deletes the active configuration file from RAM.

B. It deletes the backup configuration file in NVRAM.

C. It deletes the saved configuration file from ROM.

D. It deletes the saved configuration file from the C:\ drive.

12. What is used by distance-vector routing protocols? _____

A. topological database

B. Link-state advertisements

C. Periodic updates of entire routing table

D. Shortest path first algorithms

13. When MUST a default route be used? _____

A. The destination system is on a different network than the source.

B. The destination network is not directly connected to the router.

C. There is no entry in the routing table for the destination network.

D. The destination system is located on a stub network.

14. Which factor determine throughput? _____

A. Internetworking devices

B. Type of data being transferred

C. Topology

D. Number of users

E. all of above

15. The name of the transport layer PDU (Protocol Data Unit) is: _____

A. Segment

B. Data stream

C. Packet

D. Frame

16. Generally, PSTN (public switched telephone network) is made up of: _____

A. Local loop, toll connecting trunk, and intertoll trunk

B. Telephone and central office

C. Local loop, end office, and central office

D. Telephone, end office, and trunks

17._____forms the heart of the modern telephone system, all time intervals within the telephone system are multiples of_____ μ sec.

A. Codec/4000

B. PCM/4000

C. PCM/8000

D. PCM/125

18. Which is correct about RFCs (request for comments)? _____

A. Are internet standards

B. Are technical reports which is stored on-line and can be fetched by anyone

C. Are proposed standards

D. Just are standard drafts

19. The metric of RIP (routing information protocol) is_____

A. Hop

B. Bandwidth

C. Load

D. Delay

20. Which device would result in extension of collision domain? _____

A. Router

B. Hub

C. Bridge

D. Switch

21. Which IP address can be used to locally broadcast? _____

A. 127.255.255.255

B. 255.255.255.255

C. 164.0.0.0

D. 127.0.0.0

22. Which is the default subnet mask of D class ? _____

A. 255.0.0.0

B. 255.255.0.0

C. 255.255.255.0

D. None

23. Which is legal IP address? _____

A. 1.255.255.2

B. 127.2.3.5

C. 225.23.200.9

D. 192.240.150.255

24. Which is not a legal IP address if subnet mask is 255.255.240.0? _____

A. 143.49.37.2

B. 143. 49.16.2

C. 143. 49.8.12

D. 143. 49.49.15

25. The metric of OSPF is _____

A. Hop
B. Bandwidth
C. Load
D. Delay

IV、Answer the following question simply（30 Points，6 Points/subject）

1. List 5 kind of OSPF messages (packets), and explain when use these messages (packets).
Solution:

2.Try to explain the work principle of switch(交换机).
Solution:

3. A host **H** wants to access a web server **S**, please try to fill the following blanks of segment

header during three hand-shakes. Suppose H's ISNs (initial sequence number) and port is 200 and 3000 respectively, S's ISNs and port is 500 and 80 respectively.

Solution:

Step 1: H send S SYN segment, its partial header is as following:

Source port=_____	Destination port=_____
Sequence number=_____	
Acknowledge number=_____	

Step 2: S send back its SYN, its partial header is as following:

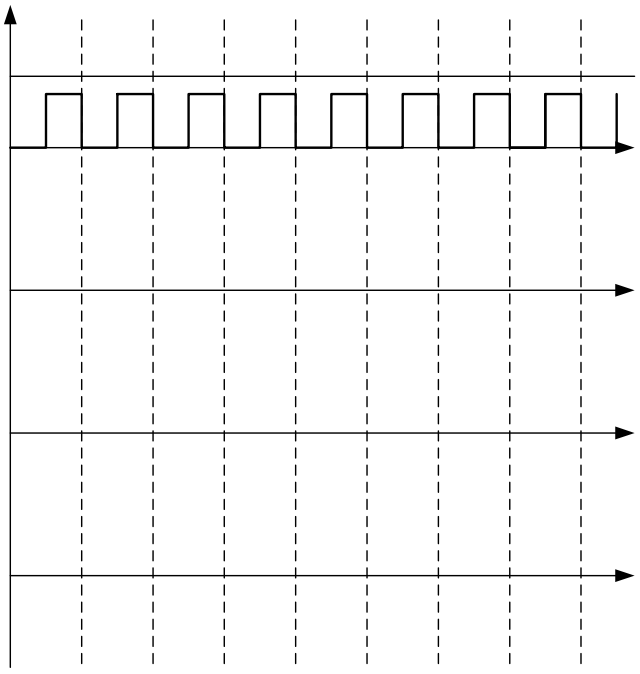
Source port=_____	Destination port=_____
Sequence number=_____	
Acknowledge number=_____	

Step 3: H send S final acknowledgement, its partial header is as following:

Source port=_____	Destination port=_____
Sequence number=_____	
Acknowledge number=_____	

4. Please draw binary encoding, Manchester encoding, and Differential Manchester encoding of binary digit 10110101.

Solution:



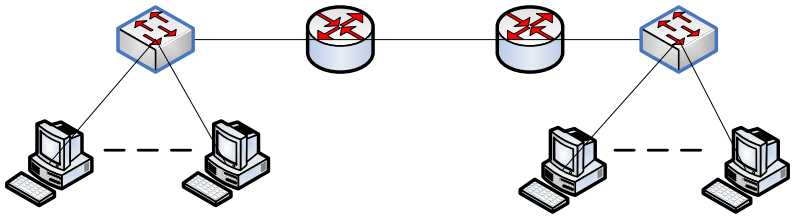
5. A communication system use Hamming code to correct one bit error, if a host receives a code as 00111000100. Question: is this code error? Why? Write the correct code if the code is error. (Suppose the original code has 7 bits, and odd-parity is used)

Solution:

1 0 1 1

V、 Analysis（20 Points）

A company has two departments, one is development Dep. Which has 30 PCs, and another is market dep. Which has 20 PCs. Now, the company has a C class address 212.112.32.0, and its network topology is as following, please try to solve the following 4 problems.



1. Please make a reasonable subnetting plan, and fill the blank. (7 Points)

Solution:

No. of subnet	Subnet mask	Address range	Broadcast addr.	Network addr.	Is usable?
No.1					
No.2					
No.3					
No.4					
No.5					
……					

E0 S0 S1 R1 Develop Dep. A1 A30

2. Please assign address for all devices in figure using your subnetting plan. (5 Points)

Solution：

R1-E0：

R1-S0：

A1：

……

A30：

R2-E0：

R2-S0：

B1：

……

B20：

3. If both R1 and R2 use RIP (Routing Information Protocol) as routing protocol, please fill the blank about routing table of R1 after steadily run. (4 Points)

Solution

Destination network adder.	Interface	Gateway adder.(next hop)	Metric(cost)

4. When interface E0 of R1 is just down, please re-fill the blank about routing table of R1 (4 Points)

Destination network addr.	Interface	Gateway addr.(next hop)	Metric(cost)