COMM.NET.200 COMPUTER NETWORKING 1

(20.12.2022)

Calculators are NOT allowed

Name:

Student number:

RULES & TIPS:

1) For test questions circle the correct answer(s). There is at least one correct answer for each test question.
2) For other questions give your answers in the provided spaces. If you run out of space for your answer, continue on the back of the page.
3) After each question you can find in brackets its rate. You can get a maximum of 75 points from this exam.
4) Read the questions VERY CAREFULLY before answering them.
5) Last but not least - GOOD LUCK!

1. A process on one host carries out a conversation with a peer process on other host by exchanging: [2]

a) PDUs b) SDUs c) ASCII characters d) MTU and SAPs

2. What do MAN and WAN stand for? [2]

a) Media Access Network and Wireless Access Network b) Medium Area Network and Work Area Network

c) Medium Area Network and Wide Access Network d) Metropolitan Area Network and Wide Area Network

3. What is Layer 7 of the OSI model? [2]

a) Session layer b) Application layer c) LLC layer d) Data Link layer

4. Which of the statements about Circuit Switching (CS) and Packet Switching (PS) are true? [2]

a) PS originates from data networks, whereas CS from analog telephone networks

b) CS implies that a dedicated communication path is established between the source and destination for the whole duration of a communication session

c) In PS networks, packets may arrive at the destination out-of-order

d) In CS networks, the available bandwidth is utilized more efficiently

5. Shortly characterize the 3 basic types of ARQ, explain the basic principles. [3]

   1) Stop-and-Wait

   2) Go-back-N

   3) Selective-Repeat

6. Link layer protocols perform the following functions: [2]

a) Routing b) Framing c) Error control d) Addressing

7. What is encapsulation and how does it work? Show it using the TCP/IP model. [3]

8. Which of the following statement best describes the physical bus topology? [2]

a) All of its nodes connected directly to one physical link

b) All of its nodes connected directly to a central point

c) All of its nodes connect to exactly 2 other nodes

d) All of its nodes connected to each other

9. Which of the following are examples of contention-based MAC techniques? [2]

a) CSMA b) ALOHA c) Centralized polling d) Token Ring

10. Which of these statements about terminators are true? [2]

a) They terminate the transmission when a sender has no more data to send

b) They are resistors attached to both ends of the bus cable

c) They prevent signal reflections

d) They send a jamming signal when a collision is detected

11. Which of the following are the layers of the IEEE 802 model? [2]

a) Presentation layer b) Session layer c) LLC layer d) Application layer

12. Which of the following describes a switch? [2]

a) It examines and filters frames that pass through it b) It has an address table

c) It works at the transport layer of the OSI model d) It is a passive device

13. Lab related question: [8]

You have a C-class network 190.100.100.0 and your mission is to organize 4 equal subnets within your network. Define the value of the subnet mask and list the IP address of each of those 4 subnets. Next, for (any) **one** of those subnetworks fill in the table below, use the other side of the paper for computations (all the addresses should be in the dotted decimal format, but keep in mind that the address computations are easier in binary format, use the other side of your paper for computing):

Max no. of workstations	
IP address	
Subnet mask	
Broadcast address	
Address of the router (gateway)	
Range of the addresses for the workstations	

Mask:

Subnet 1:

Subnet 2:

Subnet 3:

Subnet 4:

14. Which of the following statements about IP are true? [2]

a) It is a connectionless protocol b) It is an unreliable best-effort packet delivery protocol

c) It corresponds to the transport layer of the OSI model d) It uses hardware addressing

15. Which of these addresses belong to the private address space? [2]

a) 192.168.0.5 b) 130.230.1.66 c) 10.10.10.10 d) 127.0.0.1

16. You need to send 3000 bytes of data over a network that has an MTU equal to 1000 bytes. The transport layer header is 20 bytes, and the network layer header another 20 bytes. The MAC layer header has a size of 128 bits (not included it in the MTU size limit). Consider IP fragmentation: how many fragments will be sent over that network? What are the sizes (in bytes) of the fragments and which headers will be included in each of those fragments? Mind the difference between bit and byte units. [8]

17. Which of the following statements about ICMP are false? [2]

a) It is used by end systems (hosts) only

b) It is used by intermediate systems (routers) only

c) It is used by both end systems and intermediate systems

d) ICMP is the data link layer protocol

18. The traceroute program uses the following fields and flags in the IP header: [2]

a) ToS b) MF c) TTL d) MAC destination address

19. What does the receive window field in a TCP segment indicate? [2]

a) The number used to ensure correct sequencing of the arriving data

b) The sequence number of the next data byte that the receiver expects to get

c) The number of 32-bit words in the header

d) The number of bytes that the receiver is ready to accept

20. Compare the connectionless and connection-oriented modes of operation. What are the advantages and disadvantages of both modes? [3]

21. Which of these statements about flow control are true? [2]

a) It is used to detect and correct errors

b) It refers to the regulating of the rate of data flow from one device to another

c) It prevents the sender from overloading the receiver

d) It uses cryptography and authentication

22. Which of the following flow control schemes use out-of-band signaling? [2]

a) RTS/CTS hardware flow control b) XON/XOFF software flow control

c) PAUSE frame d) TCP flow control

23. Which of the following ranges is the “well known” port range? [2]

a) 0 – 255 b) 0 – 1023 c) 1024 – 49151 d) 49152 – 65535

24. List and (very) briefly explain the distance vector and link state routing protocols you know. [3]

25. Explain the purpose and the basic operation of the slow start algorithm. [3]

26. Which of the following are the application layer protocols? [2]

a) Internet Explorer b) FTP c) DNS d) TCP

27. Which of the following statements about HTTP are true? [2]

a) It is a stateful protocol

b) It is implemented in 2 programs: a client-side program and a server-side program

c) It uses in-band signaling

d) It is a peer-to-peer protocol

28. Explain the differences between the client/server and peer-to-peer models. [4]