January 15, 2025

NETWORKS 2 EXAM -ANSWERS
1H30

Multiple-Choice Questions (10 points, -0.5 points for each incorrect answer):

1. **What is an IP address?**
   a) A unique identifier assigned to a network device for communication.
   b) A physical address of a device on a network.
   c) A protocol for securing wireless connections.
   d) A type of hardware used to connect devices to a network.

2. **What is the default mask of the address 123.168.14.3?**
   a) /8   b) /16   c) /24   d) /32

3. **What is the valid range of IP addresses for a Class B network?**
   a) 0.0.0.0 to 127.255.255.255   b) 128.0.0.0 to 191.255.255.255
   c) 192.0.0.0 to 223.255.255.255   d) 224.0.0.0 to 239.255.255.255

4. **When subnetting a network, which of the following is true?**
   a) The number of subnets increases when borrowing bits from the host portion
   b) The subnet mask is unchanged
   c) The size of each subnet increases
   d) The subnetting process does not affect the IP address range

5. **What is the main function of the Transport Layer in the OSI model?**
   a)To manage physical hardware connections
   b) To provide reliable data transfer between two hosts
   c) To route data between different networks
   d) To encrypt data during transmission

6. **Which of the following is a characteristic of User Datagram Protocol (UDP)?**
   a) Reliable data delivery with error checking
   b) Connection-oriented with flow control
   c) Fast, but does not guarantee reliable delivery
   d) Uses a large amount of overhead for every data packet

7. **What is the purpose of port numbers in the Transport Layer?**
   a) To identify specific data packets
   b) To route data across different networks
   c) To identify specific processes or services on a host
   d) To ensure error-free communication

8. **Which protocol is used to realize connectionless inter-process communication?**
   ☐ TCP   ☐ UDP   ☐ FTP   ☐HTTP   ☐DHCP

9. **Which of the following protocols operates at the Application Layer?**
   a) IP
   b) TCP
   c) HTTP
   d) Ethernet

10. What does DNS (Domain Name System) do at the Application Layer?

a) Encrypts communication between devices

b) Resolves domain names into IP addresses

c) Establishes a secure connection between web servers

d) Provides email transmission services

Exercise 2 (5 points):

Your organization's network IP address is 192.30.31.0. You have subnetted your network with a subnet mask of 255.255.255.240. Complete the table below:

Class of the network address	C
Default mask	255.255.255.0
Number of subnets	16
Number of hosts per subnet	14
1st subnet	Subnet IP address: 192.30.31.0
	Broadcast address: 192.3003.1.15
	Range of valid addresses of hosts: 192.30.31.1- 192.30.31.14
2nd subnet	Subnet IP address: 192.30.31.16
	Broadcast address: 192.30.31.31
	Range of valid addresses of hosts: 192.30.31.17-192.30.31.30
3rd subnet	Subnet IP address: 192.30.31.32
	Broadcast address: 192.30.31.47
	Range of valid addresses of hosts: 192.30.31.33-192.30.31.46

Exercise 3 (5 points):

The diagram shows a communication between a client and an FTP server basing on the TCP Protocol. The client needs to download a pdf file.
According to the diagram,
1-   What means TCP?
2-   Deduct the client's request size.
3-   Deduct the size of the pdf file.
4-   Determine the values of A, B, C, D, E, F, G, H, I, J, K, L, M, N, O

111: A (50)

ACK B, 222: C (500)

ACK D

E : F (500)

ACK G, FIN H:I (J)

ACK K, FIN L:M (N)

ACK O