Name:	Group:	Mark :

NETWORKS 2 EXAM -1H30-

Exercise 1: MCQ (10 points, -0.5 points for each incorrect answer):

1. What is the role of an IP address in a network?

a) It identifies a network interface uniquely b) It identifies the manufacturer of a device

c) It encrypts data packets d) It controls data flow

2. What is the default mask of the address 172.168.14.3?

a) /8 b) /16 c) /24 d) /32

3. Which of the following ranges corresponds to a Class C IP address?

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, borrowing bits from the host part will:

a) Increase the number of subnets b) Increase the number of hosts per subnet

c) Keep the subnet mask unchanged d) Eliminate broadcast addresses

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 statement correctly describes TCP?

a) It is connectionless and fast b) It does not guarantee packet delivery

c) It provides reliable, ordered data transfer d) It operates at the Application Layer

7. What is the main purpose of port numbers?

a) Identify a host on the Internet b) Identify network interfaces

c) Identify applications or services d) Identify routing paths

8. Which port number is commonly used by DNS?

a) 21 b) 53 c) 80 d) 110

9. Which of the following protocols operates at the Application Layer?

a) IP b) TCP c) HTTPs d) Ethernet

10. What is the main function of DHCP (Dynamic Host Configuration Protocol)?

a) Encrypts data exchanged between hosts b) Automatically assigns IP addresses to devices

c) Resolves domain names into IP addresses d) Transfers files between computers

Exercise 2 (7.5 points)

1. Network Topology

2. IP Addressing Fundamentals

Parameter	Value
IP address	192.168.1.0
Address class	C
Default subnet mask	255.255.255.0
Broadcast address	192.168.1.255
Total number of valid hosts	254

3. Subnetting – Two Equal Subnets

- **192.168.1.0/25 → LAN1 (first half)**
- **192.168.1.128/25 → LAN2 (second half)**

Subnet	Network Address	Subnet Mask	Usable Host	Broadcast Address
LAN1	192.168.1.0	255.255.255.128	192.168.1.1 – 192.168.1.126	192.168.1.127
LAN2	192.168.1.128	255.255.255.128	192.168.1.129 192.168.1.254	192.168.1.255

4. IP Addressing Plan

a) Router

Device	Interface	IP Address	Subnet Mask
R1	G0/0 (LAN1)	192.168.1.1	255.255.255.128
R1	G0/1 (LAN2)	192.168.1.129	255.255.255.128

b) Servers

Server	LAN	IP Address	Subnet Mask	Default Gatew
Web Ser	LAN1	192.168.1.2	255.255.255.128	192.168.1.1
DNS Ser	LAN1	192.168.1.3	255.255.255.128	192.168.1.1
DHCP S	LAN2	192.168.1.130	255.255.255.128	192.168.1.129

c) PCs

PC / LAN	IP Address	Subnet Mask	Default Gateway
PC1 / LAN1	192.168.1.4	255.255.255.128	192.168.1.1
PC2 / LAN1	192.168.1.5	255.255.255.128	192.168.1.1
PC3 / LAN2	192.168.1.131	255.255.255.128	192.168.1.129
PC4 / LAN2	192.168.1.132	255.255.255.128	192.168.1.129
PC5 / LAN2	192.168.1.133	255.255.255.128	192.168.1.129
PC6 / LAN2	192.168.1.134	255.255.255.128	192.168.1.129

Exercise 3 (2.5 points)

Question	Answer
Default Gateway	A default gateway is the router interface IP in a subnet used to forward packets to other networks. It is required so that devices can communicate outside their own subnet.
Purpose of Subnet Mask	The subnet mask separates the network portion and the host portion of an IP address. It allows dividing a large network into smaller subnets.
Private/Public IP addresses	Private IPs are used within internal networks and are not routable on the Internet (e.g., 192.168.1.0/24, 10.0.0.0/8). Public IPs are globally unique and routable on the Interne
Network Address	The network address identifies the subnet and is used to represent all hosts in that subnet.

	Example: 192.168.1.0 for LAN1.
Broadcast Address	The broadcast address is used to send data to all hosts in a subnet. Example: 192.168.1.127 for LAN1.