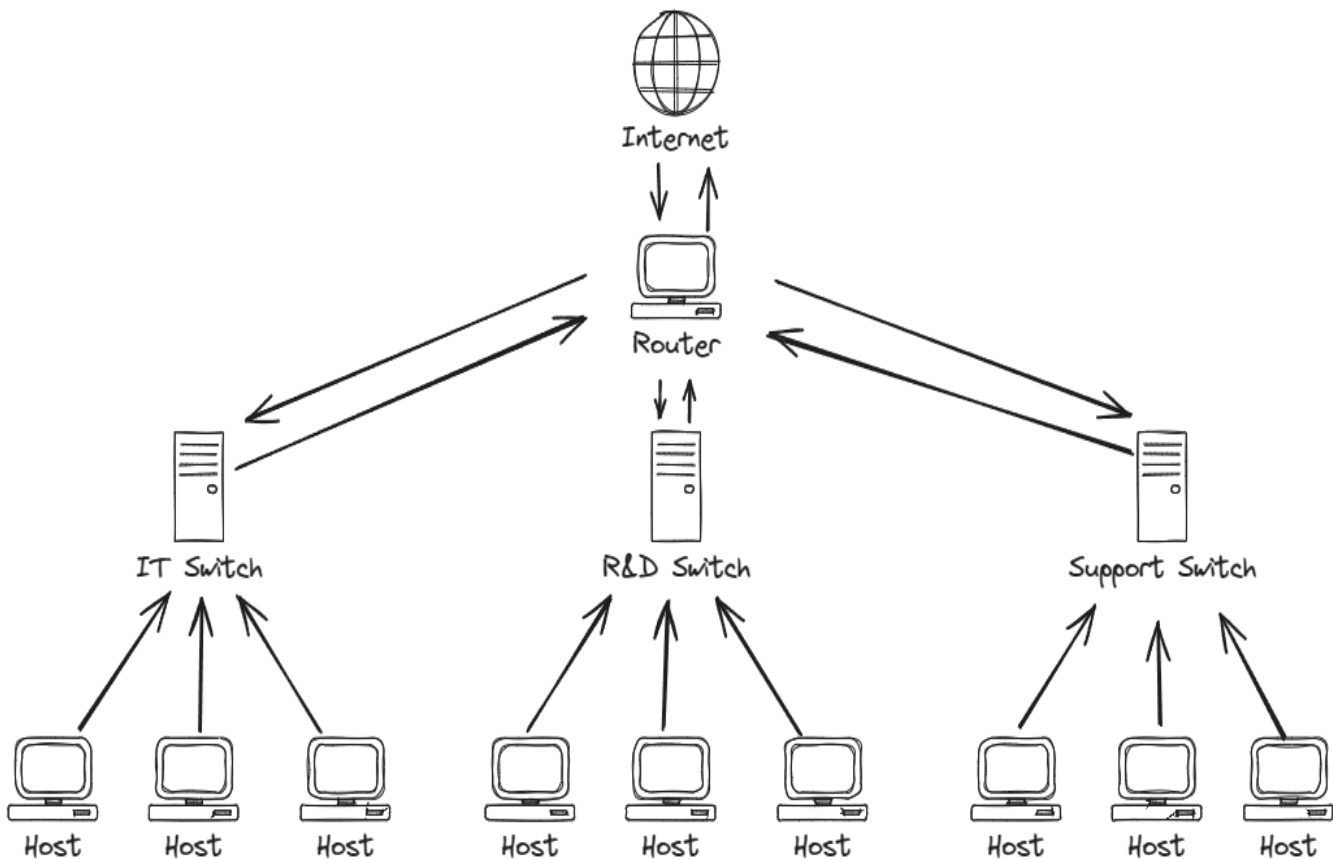


## Question -1

Real Time Group, a technology company, is expanding its network to support three departments: IT, R&D, and Support. Each department has its own switch connected to the company's router for internet access, as shown in the provided network diagram.

Based on this setup, answer the following:

1. How would you allocate subnets for IT (192.168.1.0/24), R&D, and Support to ensure efficient use of IP addresses and departmental isolation?
2. What configuration would allow the three departments to securely share a single Internet connection while maintaining network segmentation?



# Real Time College

מרכז להכשרות מקצועיות והשמה בתעשיית ההייטק

## 2. Compare between TCP and UDP

Give four differences between the two protocols

TCP	UDP

## **Question -3**

- a. Compare IPv4 and IPv6 in terms of address size and network efficiency.
- b. Distinguish between the purposes of MAC addresses, IP addresses, and network ports in networking.
- c. Briefly describe the role of CSMA in network data transmission.

## **Question -4**

1. Explain how NAT works in a network
2. What is the ARP protocol?
3. What is DNS?
4. What does the following commands do?
  - ping -c 10 127.0.0.1
5. What is the purpose of the arp -a command in a network?
6. Describe the function of the route command in managing network routes.
7. What information does the ipconfig (or ifconfig on UNIX/Linux) command provide about network interfaces?
8. Explain how the nslookup command is used in network troubleshooting.
9. Find the IP address of CNN and ynet.

## Question -5

Fill in according to the appropriate layer:

1. MAC
2. IP
3. UDP
4. TCP
5. HUB
6. SWICH
7. ROUTER
8. SKYPE

### LAYERS



## **Question - 6**

Given the network IP address 192.168.1.10/24, perform the following:

1. Identify the class of the IP address.
2. Calculate the network address.
3. Determine the broadcast address.
4. List the usable IP address range for hosts on this network.
5. Specify the subnet mask.

## **Question - 7**

Fragmentation Calculation

An IP packet of size 4,000 bytes (3980 bytes data), including a 20-byte IP header, needs to be transmitted over a network where the MTU is 1,000 bytes. (980 bytes data) + (ip header data)

Calculate the Number of Fragments: How many fragments will be created to transmit the entire packet?

Fragment Size: Indicate the size of each fragment, considering the IP header.

Fragment Offsets: Calculate the Fragment Offset for each fragment in units of 8 bytes.

Flags: State the value of the 'More Fragments' (MF) flag for each fragment.

Good Luck