Name: Fatima **Roll No. 22i-1074** **Section: A** **CNET Project**

🔹 1. Summary of Assigned IPs

- **Public IP**: `204.236.240.246`
- **Private IP for NAT**: `192.168.1.14`

🔹 2. VLSM Subnetting Plan

For each network, use **VLSM (Variable Length Subnet Masking)** based on the **minimum number of hosts**. Formula used:

Required Subnet Size = 2^n - 2 ≥ Number of Hosts

Network	Required Hosts	Subnet Mask	CIDR
A	21,799	255.255.192.0	/18
B	37,799	255.254.0.0	/15
C	44,086	255.254.0.0	/15
D	55,007	255.254.0.0	/15
E	57,485	255.254.0.0	/15
F	96,224	255.252.0.0	/14
G	48,535	255.254.0.0	/15
H	9,532	255.255.224.0	/19
I	119,167	255.248.0.0	/13
J	50,618	255.254.0.0	/15
K	30,635	255.254.0.0	/15

- **Point-to-Point Links Between Routers**: Use `/30` (4 IPs) per link.

🔹 3. Device & Interface Labeling

Device	Interface	Connected Network	IP Address (Example)
RouterA	G0/0	Network A	Depends on subnetting
RouterB	G0/1	Network B	Depends on subnetting
Router20	G0/2	Network J	NAT config here
Router8	G0/3	Network E	NAT config here
DHCP Router	G0/4	Central DHCP Link	DHCP assigned
ACL Router	G0/5	Web Server	ACL enforcement here

Label interfaces based on network and purpose, e.g., `R20-G0/0-J-Net`, `R8-G0/0-E-Net`.

🔹 4. Routing Configuration

- **Block 1**: Use **EIGRP**
- **Block 2**: Use **OSPF Area 1**
- **Block 3**: Use **OSPF Area 2**
- **Block 4**: Use **RIP**

Where routers connect across blocks (e.g., EIGRP to OSPF), apply **redistribution** between the routing protocols:

```
router ospf 1
 redistribute eigrp 100 subnets

router eigrp 100
 redistribute ospf 1 metric 10000 100 255 1 1500
```

🔹 5. DHCP Configuration

All end devices (PCs, phones, etc.) receive IPs via **DHCP** from a server in the **last block**:

```
ip dhcp pool NET_A
 network 10.0.0.0 255.255.192.0
 default-router 10.0.0.1
 dns-server 8.8.8.8

interface G0/4
 ip helper-address [DHCP Server IP]
```

🔹 6. NAT Configuration (Router20 & Router8)

Use **PAT (Port Address Translation)** on Router20 and Router8 with private IP `192.168.1.14`.

```
interface G0/0
 ip address 192.168.1.14 255.255.255.0
 ip nat inside

interface S0/0
 ip address 204.236.240.246 255.255.255.252
 ip nat outside

access-list 1 permit 192.168.1.0 0.0.0.255

ip nat inside source list 1 interface S0/0 overload
```

Repeat similarly for Router8 with the same private pool.

🔹 7. ACL Configuration

Applied to the router interface connected to the **Web Server**:

✖ Block One PC in Network A:

```
access-list 100 deny ip host [PC_IP] any
```

✖ Block Smart Phone in Network E & J:

```
access-list 100 deny ip host [SmartPhone_E_IP] any
access-list 100 deny ip host [SmartPhone_J_IP] any
```

✖ Block All Hosts in Network D:

```
access-list 100 deny ip 10.X.X.0 0.0.255.255 any
```

Finally, allow all other traffic:

```
access-list 100 permit ip any any
interface G0/5
 ip access-group 100 in
```

🔹 8. Mail Server Configuration

- Place a **Mail Server** in the **first block**
- Ensure SMTP/IMAP is enabled (Ports 25, 143)
- Configure email clients on all PCs with:

Incoming Mail Server: mail.network.local
Outgoing Mail Server: smtp.network.local
Username: device@network.local