**Computer Network Lab**

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**Roll # SU92-BSSEM-F22-090**

**Section 4B**

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Task no 11:

What is “DHCP, VLAN & DNS”, explain with Example

**1. DHCP (Dynamic Host Configuration Protocol)**

**Definition**: DHCP automatically assigns IP addresses and other network settings (like subnet mask, gateway, DNS) to devices in a network.

**Purpose**: Simplifies IP management by eliminating the need to manually assign IPs to devices.

**Example**:

* **Without DHCP**: You manually configure IPs for each device, like 192.168.1.2, 192.168.1.3, etc.
* **With DHCP**: A router assigns IPs automatically when devices connect.
  + Device-1 gets 192.168.1.2.
  + Device-2 gets 192.168.1.3.

**2. VLAN (Virtual Local Area Network)**

**Definition**: VLAN is a logical segmentation of a physical network into smaller, isolated networks, even if they share the same hardware.

**Purpose**: Enhances security and reduces broadcast traffic within a network.

**Example**:

* **Scenario**: A company has two departments: HR and IT.
* **Without VLAN**: HR and IT devices are on the same network, so they can access each other's data.
* **With VLAN**:
  + HR VLAN: Devices get IPs like 192.168.10.x.
  + IT VLAN: Devices get IPs like 192.168.20.x.
  + Communication between VLANs requires routing, adding security.

**3. DNS (Domain Name System)**

**Definition**: DNS translates human-readable domain names (e.g., www.google.com) into IP addresses (e.g., 142.250.190.78) that computers can understand.

**Purpose**: Makes it easier for users to access websites without remembering numeric IPs.

**Example**:

* You type www.google.com in your browser.
* **Without DNS**: You need to know Google’s IP address, like 142.250.190.78.
* **With DNS**: The DNS server resolves www.google.com to 142.250.190.78 and connects you.