**Create a cd pipeline in Jenkins and deploy in cloud: ( 8-MARK)**

**What is a CD Pipeline?**

A Continuous Deployment (CD) pipeline automates the steps from code commit to automatic deployment on a live server. Jenkins can build, test, and deploy your code whenever you push it to Git.

**PREREQUISITES**

* Jenkins installed and running (locally or on a VM).
* A GitHub repository with your project.
* A basic web app (Java, Node.js, or Python).
* Cloud hosting account (Render / AWS EC2 / Heroku / Netlify).

**🚀 CD Pipeline Overview**

**[GitHub Repo] → [Jenkins] → [Build & Test] → [Deploy to Cloud]**

**Step 1: Start Jenkins**

* Open Jenkins at: http://localhost:8080
* Login using admin credentials

**Step 2: Install Required Plugins**

**Go to:  
Manage Jenkins → Plugins → Available  
Search and install:**

* Git plugin
* Pipeline
* SSH Agent (for cloud deployment)
* GitHub Integration (optional)

**Step 3: Create a New Jenkins Job**

* Go to Jenkins Dashboard → New Item
* Name: My-CD-Pipeline
* Select Pipeline
* Click OK

**Step 4: Configure Git Source**

* Go to Pipeline Job → Configure
* Under Pipeline, scroll to the Pipeline Script section
* Choose Pipeline script (not from SCM if you want to write inline)

**Sample Jenkinsfile (for Node.js App Deployment on Render or Heroku):**

**Jenkinsfile script for a Node.js app:**

**pipeline {**

**agent any**

**stages {**

**stage('Clone') {**

**steps {**

**git 'https://github.com/yourusername/your-repo.git'**

**}**

**}**

**stage('Install & Build') {**

**steps {**

**sh 'npm install'**

**sh 'npm run build'**

**}**

**}**

**stage('Deploy') {**

**steps {**

**sh './deploy.sh' // Or add cloud deployment command here**

**}**

**}**

**}**

**}**

**Step 5: Connect to Cloud**

**Based on where you want to deploy:**

**1. Launch and Setup Your EC2 Instance**

* Go to [AWS EC2 Console](https://console.aws.amazon.com/ec2/).
* Launch a new Ubuntu or Amazon Linux instance.
* Download the .pem key file — this is your SSH key to access the instance.

**2. Install a Web Server or Setup Deployment Folder**

* SSH into EC2 from your local machine:

ssh -i "your-key.pem" ec2-user@your-ec2-ip

* Install NGINX or Node.js or any needed runtime.
* Create a folder like /var/www/myapp to deploy your app files.

**3. Add EC2 SSH Key in Jenkins**

* **Go to Jenkins → Manage Jenkins → Credentials → Global → Add Credentials**
* **Select:**
  + Kind: SSH Username with private key
  + Username: ec2-user (or ubuntu)
  + Private Key: Paste the .pem contents
  + ID: my-aws-key (you'll use this in pipeline)

**4. Deploy via Jenkins Pipeline Using SSH**

**In your Jenkinsfile, add:**

**stage('Deploy to EC2') {**

**steps {**

**sshagent(['my-aws-key']) {**

**sh '''**

**scp -r ./build ec2-user@your-ec2-ip:/var/www/myapp**

**ssh ec2-user@your-ec2-ip "sudo systemctl restart nginx"**

**'''**

**}**

**}**

**}**