This document outlines the equipment, infrastructure, and resources required to establish a Research and Development (R&D) Laboratory in Artificial Intelligence (AI) in India.

1. High-Performance Compute Infrastructure

- GPU-powered servers/workstations (NVIDIA A100, H100, RTX 4090/6000)
- CPU servers for general workloads
- Small, medium, or large GPU clusters based on scale

2. Networking & Storage

- High-speed LAN (10GbE or higher)
- Redundant internet connectivity
- SSD storage for datasets
- NAS/SAN storage systems
- Backup solutions (on-prem or cloud)

3. Software & Tools

- AI Frameworks: TensorFlow, PyTorch, JAX, Scikit-learn
- Development Tools: Jupyter, VS Code, PyCharm
- Containerization: Docker, Kubernetes

- Version Control: Git, GitHub/GitLab
- Experiment Tracking: MLflow, Weights & Biases

4. Cloud & Hybrid Infrastructure

- AWS (EC2, SageMaker)
- Google Cloud (Vertex AI, TPU)
- Microsoft Azure (Azure ML)
- Hybrid on-prem + cloud scaling

5. Data Management & Security

- Firewalls, VPN, role-based access
- Encryption & secure storage
- Data annotation tools (CVAT, Labelbox)
- Compliance with Indian IT laws

6. Physical Infrastructure

- Air-conditioned lab space
- UPS and power backup
- Server racks and cooling
- Ergonomic workstations

- Meeting rooms with AV setup

7. Robotics & IoT (Optional)

- Robots and sensor kits
- Raspberry Pi, Arduino
- Edge AI devices (Jetson, Coral)

8. Benchmarking & Evaluation

- Standard AI datasets
- Model evaluation test systems

9. Miscellaneous

- Research subscriptions (IEEE, ACM)
- Cloud credits
- Whiteboards and office supplies

10. Team Structure

- AI Researchers
- ML Engineers
- Data Engineers

- System Administrators

Estimated Cost (INR):

- GPU Workstations: 5–25 lakh
- GPU Cluster: 50 lakh – 5+ Cr
- Networking: 2–10 lakh
- Storage: 5–50 lakh
- Facilities: 5–30 lakh