Request for Proposal

Procurement of Software and Hardware for the Project "National Semiconductor Human Resource Development Program (NSHRDP) Phase-I"

A (01)/PSEB/2025-28

September 2025

Contents

1. Introduction to PSEB

Pakistan Software Export Board (PSEB) is an entity under the Ministry of IT & Telecom mandated to act as One Stop Shop on behalf of Government of Pakistan and ensuring of sustainable growth, development of the industry and enhancing of IT & ITeS exports. One of the objectives of PSEB is availability of skilled resource equipped with latest technologies for the IT Industry. In order to help increase the employability and to fill the supply gap for industry-ready skilled resource, PSEB under the guidance of Ministry of IT and consultation with IT Industry is initiating a series of HR development program, one of the said programs is equipping of the IT professionals and ICT & Non-ICT graduates with latest technologies by the ICT Industry Professionals which will help in enhancing the number and quality of HR workforce available to Pakistan IT & ITeS industry

2. Introduction to the Project

The National Semiconductor Human Resource Development Program (NSHRDP) – Phase-I, under the guidance of the Government of Pakistan, invites proposals from qualified and experienced vendors for the supply, installation, configuration, and technical support of a comprehensive suite of hardware and software infrastructure. The purpose of this procurement is to establish advanced semiconductor training labs across the selected academic and research institutions to equip undergraduate, graduate, and professional learners with practical skills in integrated circuit (IC) and system-on-chip (SoC) design workflows.

This procurement directly supports **Component I** and **Component II** of the NSHRDP framework, namely:

- **Component I: Semiconductor Education and Research Clusters (SERCs)**: Focused on formal academic training, this component aims to strengthen undergraduate (BS/BE) and postgraduate (MS/PhD) programs in electronics, electrical engineering, and computer engineering disciplines, through access to state-of-the-art Electronic Design Automation (EDA) tools and compute infrastructure.
- **Component II: Upskilling Training Programs (USTPs):** Targeting professionals and industry practitioners, this component seeks to deliver fast-track, modular training in digital and analog chip design, verification, layout, and embedded systems, aligned with real-world industrial demands.
- **Component III: Centralized Electronic Design Automation (EDA) Tools:** This component plays a critical enabling role by providing shared access to industry-standard EDA software, silicon IP repositories, and remote design environments through a centralized cloud-based infrastructure. This component ensures that both SERCs and USTPs have the necessary digital tools and support to deliver high-quality semiconductor education and training.

3. Objectives of Procurement

The scope of this procurement includes—but is not limited to—hardware such as high- performance computer servers, engineering workstations, laptops, network switches, centralized storage systems, and supporting infrastructure (UPS, cabling, etc.), as well as licensed software for front-end, back-end, and analog/mixed-signal semiconductor design.

By equipping universities with globally benchmarked design tools and lab facilities, NSHRDP aims to:

- Build a foundation for advanced VLSI education and research

- Increase the employability and international mobility of Pakistani engineers
- Enable partnerships with global chip design companies and MPW (multi-project wafer) programs
- Position Pakistan as a competitive contributor in the fabless semiconductor ecosystem
- Facilitate the annual Multi-Project Wafer (MPW) challenge to enable tape-out opportunities for students and faculty-designed ICs
- Provide access to a centralized repository of reusable silicon IPs to accelerate design workflows and promote IP reuse across institutions.

Through this RFP, NSHRDP seeks committed vendors with proven experience, OEM-authorized partnerships (for servers and EDA Tools, and network switches), authorized distributor (laptops, workstations) and the technical capacity to deliver turnkey EDA lab solutions.

4. Scope of Work

In order to ensure greater clarity, specialization, and competitive participation, the scope of work in this RFP is divided into two distinct lots:

- Lot 1 – Software Procurement
- Lot 2 – Hardware Procurement.

Vendors may submit proposals for either or both lots, depending on their area of expertise and capability. This division enables targeted evaluation of proposals based on the specific technical and operational requirements of each lot, and encourages the participation of qualified vendors who specialize in software solutions, hardware infrastructure, or both. Each lot will be assessed independently, and contracts may be awarded separately or jointly, based on merit, compliance, and value proposition.

4.1. Lot-1: Procurement of Software Tools

4.1.1. Software Requirements – Electronic Design Automation (EDA) Toolchain

The selected vendor shall provide, deploy, and support a comprehensive suite of Electronic Design Automation (EDA) software to enable the training of undergraduate and graduate-level students in semiconductor and integrated circuit (IC) design. The solution must encompass the full design flow from register-transfer level (RTL) specification to gate- level synthesis, physical implementation, verification, and system-on-chip (SoC) prototyping. The software licenses must be valid for academic/research and non- commercial training use and support concurrent users in lab and training environments and cluster settings till 2030.

4.1.2. Software Tools

This is to specifically note that the following is a tentative list of tools, drafted based on feedback from experts in the semiconductor sector. Bidders are also encouraged to propose additional options for industry-standard frontend and backend IC design and verification EDA tools.

Sr.#	Item	Specification	Vendor/ Manufacturer
1.		RTL Simulation	Cadence, Synopsys, Siemens or equivalent,

	Digital IC Design Flow Tools	Synthesis	Cadence, Synopsys, Siemens or equivalent,
		Design for Testability (DFT)	Cadence, Synopsys, Siemens or equivalent,
		Logic Equivalence Check	Cadence, Synopsys, Siemens or equivalent,
		Physical Design	Cadence, Synopsys, Siemens or equivalent,
		Automatic Test Pattern Generation (ATPG)	Cadence, Synopsys, Siemens or equivalent,
		Timing and Power Analysis	Cadence, Synopsys, Siemens or equivalent,
		RC Extraction and Signoff	Cadence, Synopsys, Siemens or equivalent,
		Signoff Design Rule Check and LVS Layout vs. Schematic (DRC/LVS)	Cadence, Synopsys, Siemens or equivalent,
2.	**Analog & Mixed Signal IC Design Flow**	Schematic Design	Cadence, Siemens, Synopsis, Altium, OrCAD CircuitMaker or equivalent
		Layout Design &Floor Planning	Cadence, Siemens, Sysnopsis, Altium, Room sketcher or equivalent
		Physical/Electrical Verification	Cadence, Siemens, Ikonix USA or equivalent
		Parasitics Extraction	Cadence, Siemens or equivalent
		Pre & Post Layout Simulation/ Verification	Siemens, Cadence, Ansys, or equivalent
		Design Rule Check and LVS Layout vs. Schematic (DRC/LVS)	Cadence, Synopsys, Siemens or equivalent
3.	**IC Design Verification Flow**	Linting	Cadence, Synopsys, or equivalent
		UVM-based Verification	Cadence, Synopsys, or equivalent

		Formal Verification	Cadence, Synopsys, or equivalent
		Regression Analysis	Cadence, Synopsys, or equivalent
4.	**RFIC/MMIC Design**	Keysight ADS	Cadence, Keysight, Anysys, FormFactor Inc., MathWorks or equivalent
		Cadence AWR	
		Keysight SystemVue	
		Anysys HFSS	
		Keysight EMPro	
		Cascade Microtech	
		Klayout	
		IVCAD	
5.	**PCB Design**	Schematic Capture	Cadence, Synopsys, Siemens or equivalent
		Circuit Simulation	Cadence, Synopsys, Siemens or equivalent
		PCB Layout	Cadence, Synopsys, Siemens or equivalent
		In-Design Analysis for SI/PI, impedance, coupling, DFM.	Cadence, Synopsys, Siemens or equivalent
		Documentation - automatically generated and kept in sync.	Cadence, Synopsys, Siemens or equivalent

4.1.3. Centralized Licensing and Local Cloud Server Model

All software tools must include support for:

- **Floating/Network Licenses:** License models should allow concurrent access by lab users across institutional domains.
- **License Server Integration:** Tools should support license server configuration (e.g., FlexNet), with administrator tools for monitoring and allocation.
- **Usage Tracking & Compliance:** Built-in analytics for license usage, user access reports, and compliance monitoring.
- **Local Cloud Sever Model:** The EDA tools will be hosted through a local cloud server model where universities/ institutes are partners in the program will get specific number of accounts for usage through remote mechanism.

4.1.4. Licensing Expectations

- Licenses must be valid for academic and non-commercial training use.

- Vendors should offer annual, license options with transparent renewal terms till 2030.

The selection of appropriate model will be the sole discretion of the procuring agency. All tools must be fully documented and accompanied by tutorials, lab exercises, and instructor support materials.

4.1.5. Installation and Configuration of Software

Complete Installation and Configuration Services, Customization and configuration of EDA libraries, design kits (PDKs), and technology nodes will be the responsibility of the project awardee.

4.1.6. Solution Options and Implementation Scope

For the three components under NSHRDP Phase-I, bidders may propose solutions under either of the following models:

1. **Server-Based Solution** – Procurement of dedicated hardware infrastructure along with the licensed software tools specified in the RFP.
2. **Cloud-Based Solution** – Provision of all required software/tools through a single vendor-managed cloud environment, offering a turnkey, ready-to-use setup. This model must include pre-installed software, user/student login management, automated report generation, 24/7 access, secure data backup, and scalability options.

In the first year, the scope of this RFP covers deployment across three universities, providing licenses with access to tools for a duration ranging from 1 to 6 years under the specified academic bundles and design flow. Please quote cost of one training bundle mentioning number of licenses in the bundle and the list of tools included in the bundle. The procuring agency reserves the right to procure number of bundles, number of licenses and the other tools as per its requirements and availability of budget.

4.2. Lot-2: Hardware Infrastructure Requirements

The selected vendor shall supply, install, and configure a high-availability, performance-optimized hardware infrastructure to support the delivery of semiconductor education and training. This infrastructure will be the technological foundation for hosting Electronic Design Automation (EDA) tools, simulating complex IC designs, and enabling hands-on learning in a multi-user academic setting.

The hardware must be purpose-built for compute-intensive EDA workloads, digital simulation, analog circuit verification, and SoC integration—aligned with the demands of modern chip design labs and high-throughput verification environments.

The proposed solution must include all servers, workstations, network devices, storage systems, and power backup infrastructure required to operationalize training under the National Semiconductor Human Resource Development Program (NSHRDP) at university and institutional clusters.

4.2.1. High-Performance Computer (HPC) Servers

The server infrastructure will form the **computational backbone** of the EDA lab, hosting shared tools, license servers, file repositories, user environments, and cloud-ready simulation platforms.

Option: 1

Minimum Specifications:

Sr. #	Items	Specification	Quantity
1.	**Processor**	2 × Intel Xeon Gold/Platinum CPUs or higher (minimum 32 physical cores, 64 threads or more)	**01**
2.	**Memory (RAM)**:	Minimum 512 GB DDR4 ECC RAM, scalable up to 1TB to support concurrent multi-user environments	
3.	**Storage Configuration**:	Primary Storage: 1TB NVMe SSD for OS and toolchain Secondary Storage: 10TB SAS/SATA HDD in RAID-10 configuration for EDA project data	
4.	**Networking**:	10Gbps dual-port NIC with VLAN tagging and Jumbo Frame support	
5.	**Operating System**	Red Hat Enterprise Linux 8.4 or higher (RHEL)	
6.	**Virtualization Support**:	Support for KVM, Docker, or containerized EDA workflows	

Option: 2

Minimum Specifications:

S/N	Item	Detail
1.	Chasis	With up to 8 Hard Drives
3.	CPU	Cache: 36MB, RAM: 256GB Dual Rank
4.	Storage	1.92TB x 4, 2.5" SAS SSD
5.	Raid Controller	PERC H755
6.	DVD+/RW Rom,	
7.	SATA NIC	Broadcom 5720 Quad Port
8.	GBE BASE-T	
9.	rNDC, iDRAC9 Enterprise	
10.	Dual, Hot-Plug,	
11.	Redundant Power Supply (1+1),	1400W
12.	Ready Rails	Sliding Rails without Cable Management Arm.

Deployment Expectations:

- Servers must support multi-user workloads including digital simulation, parasitic extraction, analog simulation, RTL synthesis, and verification flows.
- All firmware and BIOS should be pre-updated, and the vendor must provide full documentation and installation scripts or Ansible playbooks for rapid provisioning.

4.2.2. Engineering Workstations (Student Terminals)

Each student workstation shall be a powerful, locally hosted development node with GPU acceleration, capable of handling the entire IC design cycle—from HDL entry to analog layout—with minimum latency and real-time feedback.

Sr. #	Items	Specification	Quantity
1.	**Processor**	Intel Core i9 (12th Gen or newer) or AMD Ryzen Thread ripper (32-core or above)	**105**
2.	**Memory (RAM)**	32GB DDR4 RAM, ECC preferred	
3.	**Storage Configuration**	1TB NVMe SSD, with read/write speeds exceeding 3000 MB/s	
4.	**Networking**:	10GbE dual-port NIC with VLAN tagging and Jumbo Frame support	
5.	**Operating System**	Pre-installed Linux Red Hat Enterprise OS with basic development packages (GCC, Python, Git)	
6.	**Graphics**	NVIDIA RTX A2000 or higher, CUDA-enabled, with at least 6GB VRAM for acceleration of analog waveform processing and graphical layout rendering	
7.	**Monitor**	27” FHD (1920x1080) display mount compatibility	

4.2.3. Centralized Storage System (NAS)

To ensure data integrity, centralized access, and long-term retention of design assets, a robust and redundant storage solution is required.

Sr. #	Items	Specification	Quantity
1.	**Data Protection**:	Support for snapshotting, scheduled incremental backups, and off-site mirroring	**01**
2.	**Performance**:	Minimum 500MB/s sustained throughput for sequential read/write (with SSD caching if necessary)	

3.	**Storage Configuration**:	Minimum 40TB usable capacity (after RAID configuration) RAID-6 or ZFS-based volume pools for redundancy and performance	
4.	**Interface Support**:	NFS v4.1, SMB v3.0, iSCSI (optional	
5.	**Access Control**:	LDAP and AD integration, user/group-based permissions, secure SSH/HTTPS admin panel	
6.	**Virtualization Support**:	Support for KVM, Docker, or containerized EDA workflows	

Deployment Expectations:

- The NAS will act as a central project repository, accessible from both servers and workstations. It must allow for version control, access auditing, and multi-campus replication if extended in future phases.

4.2.4. Networking Infrastructure

The lab must include a high-bandwidth, low-latency network architecture capable of supporting intensive file transfers, license verification, and distributed simulation workloads.

Sr. #	**Items**	**Specification**	**Quantity**
1.	**Core Switch**:	10GbE Layer 2/3 managed switch, with a minimum of 4 SFP+ ports (single-mode), full duplex, VLAN, QoS, and SNMPv3 support	**03**
2.	**Access Switches**:	48-port Gigabit edge switches with PoE (optional), DHCP relay support, link aggregation (LACP)	
3.	**Cabling**	CAT6A structured cabling, patch panels, and labeled patch cords for all nodes	
4.	**Network Redundancy**:	Support for dual-link redundancy, spanning tree protocol (STP), and hot-swappable transceivers	

Deployment Expectations:

- The entire lab environment must be logically segmented via VLANs for licensing, simulation, and administrative traffic. Network configuration should allow remote management, real-time monitoring, and secure VPN access for instructor use.

4.2.5. Power Backup (Uninterruptible Power Supply)

To protect equipment and avoid data loss during outages, a reliable UPS system must be deployed:

Sr. #	**Items**	**Specification**	**Quantity**
1.	Minimum Backup Duration	15KV UPS to support up to 60 minutes full load backup for the entire lab (servers, switches, and workstations)	**03**

2.	Topology	Online or Line-Interactive UPS with Pure Sine Wave Output	
3.	Features:	SNMP/USB monitoring support, replaceable batteries, surge protection	

Deployment:

Rack-mount or tower configurations depending on lab layout, with monitoring software installed on the main server

Installation and Support

Vendors must provide:

- Full installation and configuration of all hardware components.
- Documentation of cabling layouts, IP addressing, and user access provisioning.
- Initial load testing and burn-in diagnostics for hardware validation.
- A minimum 1-year warranty with on-site support, hardware replacement commitment, and response SLA of 48 hours.

4.2.6. Items required

Sr. #	Items	Quantity
1.	FPGA kits for Lab	**60**
2.	Laser Printer for Lab	**03**
3.	Multimedia Projects for Lab	**03**
4.	Laptops	**12**
5.	Heavy Duty Color Printers	**01**
6.	Heavy Duty Printer	**01**
7.	Heavy Duty Scanner	**01**
8.	Photocopier	**01**
9.	LED (75”)	**01**
10.	Wifi Routers	**03**

**Detail specifications are mentioned at Bill of Quantity (BOQ) Lot – 2 Hardware section*

Expected Outcomes

This hardware infrastructure will enable:

- Efficient operation of multiple EDA workflows in parallel.
- Real-time collaboration and design validation among students and instructors.

- Scalability for future expansion into chip tape-out, multi-node simulation, or cloud-based EDA integration.

4.2.7. Technical Support and Services

As part of the end-to-end implementation of the Semiconductor Design Training Infrastructure, the selected vendor is required to deliver comprehensive technical support and professional services to ensure successful deployment, operational readiness, and knowledge transfer to institutional staff. These services are critical for enabling sustainable, long-term utilization of the Electronic Design Automation (EDA) toolchain and associated hardware systems across educational and research clusters.

The vendor will be responsible for installation, configuration, environment provisioning, instructor enablement, and technical support, both onsite and remote, in line with the project’s capacity-building objectives.

4.2.8. Installation and Configuration Services

The vendor must provide complete deployment of the hardware and software ecosystem, which includes:

- **End-to-End Software Installation**: All procured EDA software suites (front-end, back-end, analog/mixed-signal, verification, SoC-level) must be installed and validated on:
    - Computer servers
    - Student workstations
    - Centralized license servers
- **Environment Configuration**: Customization and configuration of:
    - Simulation and synthesis environments
    - EDA libraries, design kits (PDKs), and technology nodes
    - Lab environment templates for multi-user scheduling and access control
    - Project directory structures, user quotas, and toolchain integration (e.g., PATH, TCL scripts, environment variables)
- **OS-Level Optimization**: Includes Linux configuration for high-performance computing:
    - Kernel tuning (e.g., shared memory parameters)
    - Cron job automation for backups and logs
    - Secure SSH access for instructors and admins

4.2.9. License Server Deployment

The vendor must install, configure, and validate a centralized license management system, including:

- **License Server Deployment**:
    - Installation and activation of floating/network license servers

    - Integration with all end-user nodes and computer systems
    - Environment variable setup for client-side license paths
- **Usage Monitoring & Administration Tools**:
    - GUI/dashboard for license tracking, usage audits, and compliance monitoring
    - Scripts for automated license usage reports and alerts for administrators
- **Redundancy Configuration (Optional)**:

    High-availability license server clustering or backup configuration

5. Project Teams' Training and Capacity Building

The vendor will be responsible for **hands-on technical training** to institutional staff to ensure autonomous lab operation and user support after deployment.

Training Requirements:

- **Duration**: Minimum of **03 full working days** of **on-site training** at each lab deployment site
- **Target Audience**:
    - Lab instructors and coordinators
    - IT system administrators and support staff
- **Training Content**:
    - Introduction to EDA workflows and toolchain navigation
    - Hands-on sessions for simulation, layout, STA, synthesis, and verification flows
    - Tool-specific licensing and troubleshooting
    - File management, backup protocols, and remote support readiness
    - Software update and patching workflows
- **Training Materials**: The vendor must provide:
    - Video tutorials (if available)
    - Quick-reference sheets for common tasks
    - Post-training assessment or feedback survey

5.1. Onsite Support Services (Post-Deployment)

The vendor shall provide on-site technical support for a period of **one (1) year for workstations, laptops, and 03 years for servers** from the date of final acceptance. The support and updates services for EDA Tools and other software's will be as per licensing terms and conditions. This includes:

- **Support Scope**:
    - Software failures, simulation errors, licensing issues
    - System integration problems

    - Operating system reconfiguration if required by tool updates
    - Hardware troubleshooting assistance
- **Response Time & SLA**:
    - Critical issues: Onsite response within **24–48 hours** of issue reporting
    - Non-critical requests: Response within 72 hours
    - Monthly status reports and ticket summaries to be submitted to the client’s technical lead

5.2. Remote Helpdesk Support

A remote support facility must be operational for the entire project support window (minimum 12 months), offering:

- **Access Channels**:
    - Dedicated support email and ticketing portal
    - Helpdesk hotline (optional)
    - Live session support via Zoom/Teams (for simulation/debugging walkthroughs)
- **Support Hours**:
    - 24/7 Technical support
    - A comprehensive SLA to make 24/7 technical support optimally possible.
- **Common Use Cases**:
    - License checkout failures
    - Simulation configuration issues
    - Design rule violations and tool integration errors
    - Remote patching or updates for EDA tools

5.3. Documentation and Handover

Upon completion of deployment, the vendor shall submit:

- **Technical Deployment Report**:
    - Inventory of installed software and hardware
    - Configuration snapshots and architectural diagrams
    - Network topology and license server maps
- **User Documentation**:
    - Admin manuals for server maintenance
    - Lab usage SOPs
    - Troubleshooting FAQs
    - Contact list for support escalation

6. Evaluation Criteria

All submitted proposals will undergo a **Single Stage Two Envelope process**—technical and financial—carried out by a designated Evaluation Committee comprised of technical experts, project management personnel, and procurement professionals.

Only those proposals that meet the eligibility criteria outlined in Section 6 and are deemed technically responsive (achieving the minimum qualifying score of 70% in the technical evaluation) will proceed to the financial evaluation stage.

The following weighted evaluation criteria will be used to assess and rank the proposals:

6.1.1. Technical Compliance (100%)

100% compliance to the specification to the software and hardware tools/equipment will be mandatory.

Key evaluation factors include:

- Completeness of the hardware and software offering
- Alignment with required EDA tool categories (front-end, back-end, mixed-signal, verification, SoC)
- Compliance with server and workstation specifications
- Network, storage, and backup system compatibility
- Inclusion of centralized license server and EDA toolchain pre-configuration

6.1.2. Delivery Time & Support Plan

This assesses the bidder's ability to meet or exceed the required 60-day delivery and commissioning timeline, and the robustness of their post-sales support structure.

Key components:

- Detailed Gantt chart or implementation timeline
- Support team structure, location, and availability
- SLA commitments (onsite and remote support)
- Proactive monitoring, ticketing, and escalation procedures
- Local or regional service presence

Scoring Note:

- Higher scores for early delivery commitments with documented team availability.
- Lower scores for generic, non-local, or weakly defined support plans.

6.1.3. Relevant Experience of the Bidder

To ensure capability and reliability in delivering specialized infrastructure and academic enablement for semiconductor training, the bidder must demonstrate substantive prior experience in projects of comparable scope and complexity. Specifically:

1. The bidder must have successfully implemented at least three (03) similar projects within the last five (05) years involving (applicable as the requirement of the respective Lot):
    - Deployment, configuration, and lifecycle support of Electronic Design Automation

    (EDA) tools used in front-end, back-end, and SoC design workflows.

   - Procurement and commissioning of high-performance compute infrastructure, including servers, engineering workstations, and integrated storage systems aligned with semiconductor training and design.
   - Experience in managing centralized EDA tool environments, silicon IP repositories, or facilitating MPW (Multi-Project Wafer) tape-out programs will be considered an added advantage.

2. Projects must have been executed in academic institutions, R&D environments, or national skills development initiatives, with scope including both technical enablement and knowledge transfer/training components.
3. The bidder must submit verifiable documentation in support of their experience, including but not limited to:
   - Project summaries outlining scope, beneficiaries, technical components, and duration.
   - Client reference letters or completion certificates.
   - Evidence of partnership with OEMs or IP vendors (if applicable).
4. Preference will be given to vendors demonstrating experience in:
   - Projects funded or monitored by government, multilateral, or educational oversight bodies.
   - End-to-end delivery (design to deployment) of EDA and hardware environments aligned with academic or commercial tape-out workflows.

6.1.4. Training Plan and Capacity Building

This criterion evaluates how well the bidder plans to build the technical capacity of lab instructors and IT staff through structured training.

Evaluation includes:

- Duration and scope of training (minimum 3 days required)
- Use of certified trainers or vendor-led sessions
- Quality of materials provided (manuals, tutorials, SOPs)
- Post-training support options (Q&A, helpdesk, refresher sessions)

Scoring Note:

- Full points for structured, tool-specific, hands-on training led by experts.
- Reduced scores for limited or generic training commitments.

6.2. Mandatory Eligibility Criteria Checklist

Before the Bidders submit their Proposals, within the stipulated time mentioned in this Request for Proposal document, Bidders are required to make sure that following mandatory requirements of this RFP document are fulfilled. These requirements must be furnished at the time of submission of Proposal. Non-submission of any one of the following applicable requirements shall result in disqualification:

Sr#	**Mandatory Eligibility Criteria Checklist** (If compliant, please check , otherwise put a Cross in the Mark Column)	**Mark (Yes/No)**
1.	Proof of Certificate of Incorporation or Registration or equivalent	
2.	Proof of NTN Certificate	
3.	Proof of GST Certificate (If compliant, please check, otherwise put a Cross in the Mark Column) GST Statement (paid during last 5 year),	
4.	The firm should have its or its associates' offices in all three major cities of Pakistan (i.e. Lahore, Karachi & Islamabad)	
5.	Participating firm must provide Manufacturer's Authorization Letter (for servers and EDA Tools, and network switches), and authorized distributor (laptops, workstations) from Principal in the name of tender undersigned (wherever is applicable)	
6.	Provide Bank Statement / Audited Financial Statement of Minimum Rs. 100 Million Turnover during any of the last 03 years.	
7.	Original affidavit (not older than one month) on Stamp Paper(s) of worth Rs.100 or more that Bidder is not insolvent, bankrupt and is not blacklisted or debarred by PPRA, Government, Semi-Government, Private, Autonomous body or any other international organization.	
8.	Original affidavit (not older than one month) on Stamp Paper(s) of worth Rs.100 or more that the Bidder is an active tax payer and has submitted its tax return for the preceding fiscal year. **Tax payer list serial number (downloadable from FBR's website) is also to be mentioned.**	
9.	Bidder must quote all items mentioned in a lot that bidder has applied for, otherwise the bid shall be rejected.	
10.	**"TECHNICAL PROPOSAL –** ***Procurement of Software and Hardware for Training in Semiconductor Design National Semiconductor Human Resource Development Program (NSHRDP)*** Technical Proposal must be submitted on E-Pads (https://eprocure.gov.pk/). Bidders are to make sure that Financial Proposal is **not** part of the Technical Proposal in any form.	
11.	**"FINANCIAL PROPOSAL -** ***Procurement of Software and Hardware for Training in Semiconductor Design National Semiconductor Human Resource Development Program (NSHRDP)"*** Financial Proposal must be submitted on E-Pads (https://eprocure.gov.pk/). The Financial Proposal should not be part of Technical Proposal in any form.	

Note: Bidders are required to submit *filled, signed & stamped copy of the above checklist* along with the Proposal.

6.3. _Other mandatory Instructions to bidders

Undertaking on letter head that all items will be delivered within agreed timelines after the issuance of purchase order/Contracts Sign. Failing to provide items within agreed timelines, a penalty will be levied as follows:

Sr.#	Major Area	Parameter	Requirements	Penalty
1	Delivery of the equipment as per PO	Equipment delivery, installation and commissioning	Agreed timeframe (in Weeks)	Delay up to 4weeks after scheduled date @1.0% and beyond 4weeks penalty will be 2% of PO value. Week means full week (7 days). If delay is more than 8 weeks from the scheduled date, authority reserves right to cancel the order.
2	Technical support and replacement of faulty equipment/parts during warranty period	Time taken by the Bidder to fix the problem	Within 12 hours of reporting	As per Escalation Chart under SLA to be signed between PSEB and bidding firm.

6.4. Technical Evaluation Criteria

During the technical evaluation no amendments in the Proposals shall be permitted. Bidders who obtain at least 70% marks in general and 100% marks in Conformity Matrix to Tender Specification in technical evaluation criteria will qualify and Financial Proposals would be opened only for technically qualified Bidders.

Financial Proposals of those Bidders obtaining less than 70% marks in in Technical Evaluation shall remain un-opened and will be returned to the Bidders. An evaluation committee appointed by the Company will evaluate Technical Proposals based on their compliance with the RFP and by applying the evaluation criteria and the point system, specified below:

Sr#	Description	Max. Score	Marks Allocation	
1.	Firm/Bidder Profile (Registered age, and Financial position) – **(Form B2)**	10	01 mark per year (Max. 10 Marks)	10
		10	Annual turnover +50 mil	10
			Annual turnover 30-49 mil	07
			Annual turnover 10-29 mil	05
2.	Relevant Experience of the Firm/Bidder - **(Form B3)** PO & Completion certificate shall be attached as evidence.	30	Successfully completed project of similar nature and size (1 Project= 3.0 Marks) Mini. 03 projects are mandatory during last 03 years.	30

3.	Qualification and Competence of the proposed Team Members–Full Time/Part time/ On-call **(Form B4-I & B4-II)** Qualification, Total experience, and Professional Certifications /Memberships of technical team (Must mention verifiable certification number#)	20	Relevant work experience of team lead (One project=1.0 marks)	10
			Relevant experience of the team deployed on project (switching experts, trainers, installation experts, ………)	10
4.	Component wise work plan & Timelines	10	Submission of work plan with timelines	10
5.	Proposed Methodology	20	Equipment delivery, installation, testing and Commissioning	10
			Support & Maintenance Plan Quality of the proposed support and maintenance plan will be taken into account while awarding score	10
6.	Transfer of Knowledge	10	Submission of training plan for PSEB's designated staff	05
			Provisioning of technical / user manuals	05
7.	Technical Bid Completeness	10	Technical bid completeness in accordance with the RFP	10
8.	Presentation/Demonstration of the Proposed Solution	20	Onsite presentation of proposed solutions by participating bidders	20
	G. Total	**140**		

6.5. Final Ranking and Award Decision

After completion of both technical and financial evaluations, the proposal with the highest combined score (out of 100%) will be declared most advantageous bidder and recommended for award of contract, provided it meets all mandatory compliance and legal requirements.

In the event of a tie, preference will be given to the proposal with:

- Better support infrastructure

- Proven project success in public-sector academic environments
- More favorable licensing terms (longer validity, more concurrent users)

For Lot-1 Software Procurement

Financial bids of only technically qualified Firms / companies will be opened. Quoted prices shall include all applicable taxes.

Evaluation of financial bids / Score will be calculated as following:

- The weightage of financial proposal is 30% in the total score.
- The financial weightage will be calculated by the following formula:
  = (lowest bid/bid offered by this firm) *30 The score achieved by a bidder will be aggregated as follows:
- Total score obtained by a bidder = Technical weightage + Financial weightage

For Lot-2 Hardware Procurement

Financial bids of only technically qualified Firms / companies will be opened. Quoted prices shall include all applicable taxes.

Evaluation of financial bids / Score will be calculated as following:

- The weightage of financial proposal is 30% in the total score.
- The financial weightage will be calculated by the following formula:
  = (lowest bid/bid offered by this firm) *30 The score achieved by a bidder will be aggregated as follows:
- Total score obtained by a bidder = Technical weightage + Financial weightage

7. Instructions for Bidders

This document contains all the information pertinent to this solicitation and governs the preparation and submission of Proposals. The technical & financial forms to be filled by Bidder for this assignment are annexed with this RFP document. Proposals must be submitted by the deadline, completed on the formats provided by the Company, with supporting documents, according to the guidelines given in the section titled Instructions & Information for Bidders. Proposals will be evaluated by bid evaluation committees constituted by the Company. Selection of Bidders will be on Quality and Cost Based Selection methodology as provided in the Bidding Document.

Vendors are invited to submit proposals for one or both lots under this RFP, namely

- Lot 1: Software Procurement and
- Lot 2: Hardware Procurement.

Proposals must be clearly labeled to indicate the specific lot(s) being addressed. Each lot must be supported by a separate Technical Proposal and a separate Financial Proposal, submitted on E-Pad. Vendors submitting proposals for both lots must ensure that the documentation for each is complete and independently evaluated. The bidders can quote in one lot or more and the purchase order may be issued accordingly The Committee reserves the right to award contract for each lot independently, based on the evaluation criteria and value offered.

Based on the availability of allocated funds, PSEB reserves the right to determine the exact quantity and category of equipment to be procured under this RFP. The procurement process will be guided by strategic priorities, institutional readiness, and alignment with project objectives. PSEB may choose to procure select hardware or software items from the proposed list depending on budgetary constraints and technical evaluations. This ensures optimal resource utilization while maintaining the flexibility to address emerging needs during project execution.

8. Bidding Document

The Bidder is expected to examine all instructions, general conditions, forms, terms and specifications contained in the RFP document and its annexures. Failure to comply with instructions will be at the Bidder's risk and may affect the evaluation of the Proposal. Proposals that do not comprehensively address the scope of work/ToR and other requirements may be rejected. Inability to comply with applicable instructions, general conditions of contract, terms and specifications may lead to rejection of Proposal.

9. Preparation of Proposal

9.1. Language of the Proposal

Proposals prepared by the Bidders and all correspondence and documents relating to the Proposal exchanged between the Bidders and the Company shall be in writing and in English Language.

9.2. Proposal Currency

All prices shall be quoted in Pakistan Rupees (PKR) and all payments will be made in Pakistan Rupees (PKR.).

9.3. Period of Validity of Proposal

Proposals shall remain valid for 180 days from the date of advertisement as provided in the RFP document. In exceptional circumstances, Company may solicit the Bidder's consent to an extension of the period of validity without any material changes in the Bidding Document.

9.4. Supporting Documents

While preparing the Technical Proposal, the Bidder shall ensure that it provides the Company with documentary evidence. Bid evaluation committees will evaluate Proposals solely on the basis of documentary evidence submitted in accordance with evaluation criteria described in this Bidding Document.

9.5. Cost of Preparing Proposal

All costs of preparing Proposal and of negotiating with Company, including visits for discussion with Company, are not reimbursable.

9.6. Proposal Documents

The Proposal, in binder form, with serial number of each page should comprise the following:

Technical Proposal

Technical Proposal must consist of the following:

a) **Checklist** (Mandatory Documents required with the Proposal)
b) Technical Proposal Submission – Form B1
c) Firms/Bidders Profile – Form B2
d) Relevant Experience of the Firm/Bidder – Form B3
e) Qualification, Total Experience and professional Certification/Membership – Form B4-I
f) Composition of Proposed Project Management Team with Organogram – Form B4-II

Technical Proposal shall detail the capability and experience of delivering the services specified in the ToR. Bidder shall submit details of maximum ten of their most relevant/similar nature assignments for technical evaluation using the prescribed format. Assignments submitted beyond the given number will not be considered.

Team structure proposed by the Bidder for the project (including updated CVs of individuals involved in management and project implementation) in accordance with relevant *Forms.*

Financial Proposal

Financial Proposal must consist of the following:

a) Financial Proposal Submission Form– *Form C1*

b) Summary of costs *– Form C2*

9.7. Format and signing of Proposal

The Proposal shall contain no interlineations, erasures, or overwriting, except, as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by Bidder's authorized person. The Proposals shall be clear and elaborate. Different parts of Proposals shall be separated using color separators, flags or tags.

Note: *The Technical Proposal must not contain any pricing information whatsoever. Non-compliance will lead to rejection of the Proposal.*

9.8. Submission, Receipt, and Opening of Proposal

Technical and Financial Bids shall be in English language. Single Stage Two Envelop Procedure of Principal Method of Procurement (i.e. Open Competitive Bidding) will be used by adopting Quality and Cost Based Selection for the subject procurement.

9.8.1. Bids should be submitted electronically ONLY through EPADS. Manual submission of bids is NOT allowed.

9.8.2. For registration and training on EAPDS or in case of any technical difficulty in using EPADS, prospective bidders may contact PPRA Team, Director MIS Room No.109, 1s' Floor, FBC building Sector G-5/2, Islamabad. Contact Number 051-111-137-237.

9.8.3. The bids, prepared in accordance with the instructions in the bidding documents along with bid security instrument (Copy) & Proof of Eligibility documents as specified in bid documents in favor of the undersigned must be submitted through EPADS by 22nd September 2025 at 03:00PM. Bids will be opened on the same date at 03:30 PM.

9.8.4. Technical bid mentioned with "Procurement of Software and Hardware for Training in Semiconductor Design National Semiconductor Human Resource Development Program (NSHRDP)"containing technical specifications only (without prices).

9.8.5. Financial proposal shall be mentioned with " Procurement of Software and Hardware for Training in Semiconductor Design National Semiconductor Human Resource Development Program (NSHRDP)" containing the financial proposal.

9.8.6. The scanned copy of the earnest money in the shape of Bank Draft / Pay Order shall be in favor of "Pakistan Software Export Board" and shall be included in Technical Proposal.

9.8.7. The company can participate in one Lot or both Lots. The scanned copy of the earnest money in the shape of Bank Draft / Pay Order shall be in favor of "Pakistan Software Export Board" and shall be included in Technical Proposal.

9.8.7.1. For Lot-1 Software - earnest money of PKR 1,000,000/-

9.8.7.2. For Lot-2 Hardware - earnest money of PKR 2,000,000/-

Note: Original Bid Security instrument MUST BE submitted to the under signed before closing hours of the bids submission time.

10. Delivery Timeline

To ensure timely execution and alignment with the objectives of the National Semiconductor Human Resource Development Program (NSHRDP), the selected vendor is required to complete the entire delivery and deployment of the hardware and software infrastructure within a strict timeline.

10.1. Delivery and Installation Period

- All hardware (servers, workstations, storage systems, networking equipment, and power backup units) and software (EDA tool suites, license servers, etc.) must be delivered, installed, and fully commissioned within sixty (60) calendar days from the date of contract award.
- Delays beyond the stipulated timeline will result in liquidated damages or penalties as per contract terms, unless officially extended by the client due to documented force majeure circumstances.

10.2. Commissioning Requirements

- The commissioning process shall include:
    - Full hardware integration and connectivity testing
    - Software installation and verification on all specified nodes
    - Deployment of license servers and access provisioning
    - Functional testing of at least three EDA design flows (front-end, back-end, analog/mixed-signal)

    - Submission of deployment checklist and technical completion report

10.3. Acceptance Testing

- Final delivery will only be deemed complete upon successful:
    - On-site validation of system performance
    - Execution of sample workloads by designated faculty/staff
    - Sign-off from the NSHRDP Technical Lead and Lab Coordinator

11. Terms and Conditions

All bidders are required to review and comply with the following general and specific terms and conditions of the RFP. These terms shall form the basis of the contractual agreement with the selected vendor.

11.1. Right to Reject

- NSHRDP reserves the right to accept or reject any or all proposals, wholly or in part, without assigning any reason or incurring any liability to the bidders.

11.2. Payment Terms

- No **advance payments** shall be made under any circumstances, except 20% mobilization advance against the unconditional bank guarantee issued in the name of Pakistan Software Export Board.
- Payments shall be released in accordance with approved milestone deliverables linked to:
    - Delivery of equipment
    - Completion of installation and commissioning
    - Completion of training and support onboarding
    - Final acceptance by the designated evaluation committee

11.3. Licensing Compliance

- All proposed software must be:
    - Legally licensed for use in Pakistan
    - Free of trial versions, evaluation restrictions, or hidden usage lock-ins
    - Valid for the stated licensing term and intended academic/training use
- The vendor shall be held accountable for **any licensing violations**, and any such software will be rejected at no cost to NSHRDP.
- Vendors must ensure that licensing terms are valid through at least 2030, as per the academic and training requirements of the NSHRDP.

11.4. Warranty and Support Obligations

- Vendors must provide at least **one (1) year warranty** on all hardware components other than 03 years' warranty for Servers.
- Post-deployment support (both onsite and remote) must meet or exceed the agreed **Service Level Agreement (SLA)**:
    - **Critical issues**: response within 24–48 hours

    - **Non-critical issues**: response within 72 hours
- Breach of SLA terms (e.g., repeated support delays, unresolved system downtime) may result in financial penalties, withheld payments, or contract cancellation**.**

11.5. Performance Guarantee

The successful firm(s) will have to provide performance Guarantee/ Bond equal to **10 %** of the contract value in shape of Bank Guarantee/ Demand Draft/ pay Order in favor of M/S Pakistan Software Export Board.

11.6. Substandard, refurbished and none compliant item(s) will be rejected by the PSEB at any stage after or during the supply

12. Force Majeure

- If either party is temporarily rendered unable, wholly or in part by Force Majeure to perform its duties or accept performance by the other party under the Contract it is agreed that on such party, giving notice with full particulars in writing of such Force Majeure to the other party within 14 (fourteen) days after the occurrence of the cause relied on, then the duties, of such party as far as they are affected by such Force Majeure shall be suspended during the continuance of any inability so caused but for no longer period and such cause shall as far as possible be removed with all reasonable speed. Neither party shall be responsible for delay caused by Force Majeure.
- The terms "Force Majeure" as used herein shall mean Acts of God, strikes, lockouts or other industrial disturbance, act of public enemy, war, blockages, insurrections, riots, epidemics (including operational disruptions due to government imposed COVID-19 restrictions), landslides, earthquakes, fires, storms, lightning, flood, washouts, government imposed restrictions due to environmental hazards, civil disturbances, explosion, Governmental Export/Import Restrictions, Government actions/restrictions due to economic and financial hardships, change of priorities and any other causes similar to the kind herein enumerated or of equivalent effect, not within the control of either party and which by the exercise of due care and diligence either party is unable to overcome.
- The terms of this Contract shall be extended for such period of time as may be necessary to complete the work which might have been accomplished but for such suspension. If either party is permanently prevented wholly or in part by Force Majeure for period exceeding 4 (four) months from performing or accepting performance, the party concerned shall have the right to terminate this Contract immediately giving notice with full particulars for such Force Majeure in writing to the other party, and in such event, the other party shall be entitled to compensation for an amount to be fixed by negotiations and mutual agreement.
- If a Force Majeure situation arises, the Bidder shall promptly notify PSEB in writing of such conditions and the cause thereof. Unless otherwise directed by PSEB in writing, the bidder shall continue to perform its obligations under the Contract as far as is reasonably practicable and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

13. Submission Instructions

Bidders must submit their proposals on E-Pad in accordance with the instructions below. Failure to comply with these instructions may result in the rejection of the proposal.

14. Submission Address

All proposals must be uploaded on E-Pad to the following address:
https://eprocure.gov.pk/

For general queries, please contact:

Mr. Muhammad Arif
Manager Administration
Email: rarif@pseb.org.pk
Pakistan Software Export Board, 6th Floor New State life Building, Blue area, Islamabad

PART B-

TERMS OF REFERENCE

15. Terms of Reference

The Successful Bidder is expected to provide the following services: -

15.1. Principal Vendor’s 24x7x365 Online Technical Support

Principal vendor should provide “Online Technical Assistance” to PSEB 24 hours a day, 365 days per year that includes, when requested, the following technical assistance:

- 24/7 technical assistance
- Technical information service
- Software support
- Answering technical queries
- Fault diagnostic service and problem identification, including generic design faults.
- Vendor shall ensure that Principal Hardware/Software contact numbers are provided to PSEB before or immediately after the contract start date of the service.
- PSEB shall have access to download software updates or upgrades to licensed software purchased from Principal. These releases or upgrades shall be applied at the discretion of PSEB, when PSEB requires them.
- Support the annual MPW (Multi-Project Wafer) challenge by enabling tape- out-ready design submissions from partner institutions.
- Maintain and manage a centralized IP repository accessible to all participating institutions.
- Vendor shall quote the warranty of the required items on annual basis for a total period not more than three (3) years and on yearly basis for Router/Switch & Firewall. (Quote with 1, 2 and 3-year warranty)
- Warranty for other items exclusive of Router/Switch & Firewall will be 1 year. (Hardware & Software wherever applicable)

15.2. Details of Maintenance & Support Services

The bidder shall clearly indicate the points of presence in Pakistan for maintenance purpose. Maintenance/Part Replacement/Technical Support charges under the warranty period shall be included in the bid. The vendor will submit an SLA to carry out the activities such as equipment maintenance, faulty part replacement and technical support during the warranty period without any cost.

15.3. Payment Plan

All payments will be made on;

The delivery of hardware and its successful installation and commissioning.

15.4. Joint Venture (JV) / Consortium Requirements

In cases where a bidder participates as part of a Joint Venture (JV) or Consortium, the following provisions shall apply:

1. **Lead Bidder Appointment and Responsibility**
    - The JV/Consortium must formally nominate a Lead Bidder through a notarized JV/Consortium Agreement at the time of submission.
    - The Lead Bidder shall act as the sole authorized representative of the JV/Consortium for all communications, clarifications, negotiations, and contractual obligations with PSEB.
    - If the JV/Consortium wins the tender, the Lead Bidder will bear full legal and financial responsibility for the execution, delivery, and performance of the contract, regardless of internal arrangements between members.
    - PSEB will recognize only the Lead Bidder as the contracting party and will not engage with individual consortium members for contractual matters.
2. **Mandatory Documentation for Each JV/Consortium Member**
   Each member of the JV/Consortium must submit the following:
    - Valid National Tax Number (NTN) or equivalent tax registration certificate.
    - Certificate of Incorporation/Registration of the business entity.
    - Audited Financial Statements for the last three (3) fiscal years, demonstrating financial stability.
    - Evidence of Relevant Experience, including client references and proof of similar project delivery.
    - JV/Consortium Agreement, duly signed and notarized, clearly specifying:
        - Roles and responsibilities of each member.
        - Percentage of work and payment share.
        - Duration and scope of the partnership.
3. **Eligibility Compliance**
    - All members must individually meet the basic eligibility requirements outlined in the RFP.
    - The Lead Bidder must meet the minimum technical capacity and financial capacity criteria independently.
4. **Single Point of Contact & Liability**
    - The Lead Bidder will be the sole point of contact for PSEB throughout the tendering, contract execution, and project lifecycle.
    - The Lead Bidder will be jointly and severally liable for the obligations of all consortium members under the contract.
5. **Post-Award Responsibilities**
    - The Lead Bidder shall coordinate the performance of all consortium members to ensure seamless delivery as per project timelines.
    - All consortium members shall remain collectively accountable for contractual performance; however, PSEB will seek recourse solely from the Lead Bidder in case of non-performance, delays, or breaches.

PART C

FORMS TO BE SUBMITTED WITH THE PROPOSAL

16. Technical Proposal - Standard Forms

- B1 - Technical Proposal Submission
- B2 - Firms/Bidders Profile
- B3 - Relevant Experience of the Firm/Bidder,
- B4-I - Qualification, Total Experience and professional Certification/Membership
- B4-II- Composition of Proposed Project Management Team with Organogram

16.1. B1. Technical Proposal - Submission Form

To: Project Director
Pakistan Software Export Board
6th Floor New Statelife Building, Blue area, Islamabad
Islamabad, Pakistan
Tel: +92-51- 111 333 666
Fax: +92-51- 921-9075
Email: NSHRDP@pseb.org.pk
Islamabad, Pakistan

Sir,

We, the undersigned, offer to provide the services for execution of "**Procurement of Software and Hardware for Training in Semiconductor Design National Semiconductor Human Resource Development Program (NSHRDP)"** in accordance with your Request for Proposal dated (Date, Month, 2025). We are hereby submitting our Proposal, which includes this Technical Proposal and Financial Proposal on E-Pads (https://eprocure.gov.pk/) (https://eprocure.gov.pk/).

Our Technical Proposal shall be binding upon us subject to the modifications resulting from Contract negotiations, up to expiration of the validity period of the Proposal, which is 180 calendar days from the date of advertisement.

We understand you are not bound to accept any
Proposal you receive.

Yours sincerely,

Authorized Signature:

Name and Title of Signatory:

Name of Firm: Address:

16.2. B2. Firms/Bidders Profile

Sr. #	Criteria	Response
1	**Profile of the agency:** i. Registered age of Firm ii. Names of Managers/ Owners/ CEO/ Directors/ Partners	
2	i. Location of Firm office/sub office ii. Number of relevant employees including their Names & Designations, Contact Numbers & Branch contact numbers	
3	**Financial Position** i. Name of Banks ii. Certificate of Financial position iii. Copy of audited Annual Accounts (of last 3 years) iv. Tax Registration (NTN/STN/FTN)	

16.3. B3. Relevant Experience of the firm/Bidder

Experience of Providing Data Center equipment, installation, configuration and testing.

Title & Project Synopsis	Name and contact details of Focal Person of Bidder	Client Name, Organization, Focal Person Name & Phone Numbers	Project Worth	Project Duration

*Please attach relevant documents to corroborate your information.

B4-I. – Qualification, Total Experience and professional Certification/Membership Personnel Summary (Complete for each Team Member)

Name of Employee:

Position		
General Information	Name:	Date of Birth:
	Telephone:	
	Fax:	
	Years with Present Employer:	

Employment Record:

Summarize overall professional experience in reverse chronological order.

DD/MM/YY		**Company/Project/Position/Specific Tech experience**
From	**To**	

Relevant Experience:

Summarize relevant experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project:

DD/MM/YY		**Company/Project/Position/Specific Tech experience**
From	**To**	

Education:

Highest Level of Degree	Relevance of Degree to the Assignment
MPhil	
Masters	
Bachelors	

Certification:

Memberships:

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and my experience.

______Date: *[Signature of staff member and authorized representative of the firm] Day/Month/Year*

Full name of staff member:
______

Full name of authorized representative:
______

16.4. B4-II – Composition of Proposed Project Management Team with Organogram

Sr. #	Name/ Designation	Experience/ No. of years	Relevant Experience in Previous Assignments	Proposed Role in this Project

17. Compliance Sheet of Lot-1 Software

100% compliance to the specification is mandatory

Sr.#	Item	Specification	Vendor/ Manufacturer	Compliant Yes/ No
1.	**Digital IC Design Flow (Tools**	RTL Simulation	Cadence, Synopsys, Siemens or equivalent	
		Synthesis	Cadence, Synopsys, Siemens or equivalent	
		Design for Testability (DFT)	Cadence, Synopsys, Siemens or equivalent	
		Logic Equivalence Check	Cadence, Synopsys, Siemens or equivalent	
		Physical Design	Cadence, Synopsys, Siemens or equivalent	
		Automatic Test Pattern Generation (ATPG)	Cadence, Synopsys, Siemens or equivalent	
		Timing and Power Analysis	Cadence, Synopsys, Siemens or equivalent	
		RC Extraction and Signoff	Cadence, Synopsys, Siemens or equivalent	
		Signoff Design Rule Check and LVS Layout vs. Schematic (DRC/LVS)	Cadence, Synopsys, Siemens or equivalent	
2.	**Analog & Mixed Signal IC Design Flow**	Schematic Design	Cadence, Siemens, Synopsis, Altium, OrCAD CircuitMaker or equivalent	
		Layout Design &Floor Planning	Cadence, Siemens, Sysnopsis, Altium, Room sketcher or equivalent	

		Physical/Electrical Verification	Cadence, Siemens, Ikonix USA or equivalent	
		Parasitics Extraction	Cadence, Siemens or equivalent	
		Pre & Post Layout Simulation/ Verification	Siemens, Cadence, Ansys, or equivalent	
		Design Rule Check and LVS Layout vs. Schematic (DRC/LVS)	Cadence, Synopsys, or equivalent	
3.	**IC Design Verification Flow**	Linting	Cadence, Synopsys, or equivalent	
		UVM-based Verification	Cadence, Synopsys, or equivalent	
		Formal Verification	Cadence, Synopsys, or equivalent	
		Regression Analysis	Cadence, Synopsys, or equivalent	
4.	**RFIC/MMIC Design**	Keysight ADS	Cadence, Keysight, Anysys, FormFactor Inc., MathWorks or equivalent	
		Cadence		
		Keysight SystemVue		
		Anysys HFSS		
		Keysight EMPro		
		Cascade Microtech		
		KLayout		
		IVCAD		
5.		Schematic Capture	Cadence, Synopsys, Siemens or equivalent	

	PCB Design			
		Circuit Simulation	Cadence, Synopsys, Siemens or equivalent	
		PCB Layout	Cadence, Synopsys, Siemens or equivalent	
		In-Design Analysis for SI/PI, impedance, coupling, DFM.	Cadence, Synopsys, Siemens or equivalent	
		Documentation - automatically generated and kept in sync.	Cadence, Synopsys, Siemens or equivalent	

18. Compliance Sheet of Lot-2 Hardware

100% compliance to the specification is mandatory

Sr.#	Item and Specifications	Complaint Yes / No
1.	**High End Server for EDA tools** **Type: I** **Processor:** 2 × Intel Xeon Gold/Platinum CPUs or higher (minimum 32 physical cores, 64 threads or more) **Memory (RAM)**: Minimum 256 GB DDR4 ECC RAM, scalable up to 1TB to support concurrent multi-user environments **Storage Configuration**: Primary Storage: 1TB NVMe SSD for OS and toolchain Secondary Storage: 10TB SAS/SATA HDD in RAID-10 configuration for EDA project data **Networking**: 10GbE dual-port NIC with VLAN tagging and Jumbo Frame support **Operating System Compatibility**: Fully compatible with Red Hat Enterprise Linux (RHEL), CentOS, and Ubuntu LTS **Virtualization Support**: Support for KVM, Docker, or containerized EDA workflows **Type-II** **Chasis**: With up to 8 Hard Drives **CPU**: Cache: 36MB, RAM: 256GB Dual Rank **Storage:** 1.92TB x 4, 2.5” SAS SSD **Raid Controller**: PERC H755 **DVD+/RW Rom,** **SATA NIC:** Broadcom 5720 Quad Port **GBE BASE-T** **rNDC, iDRAC9 Enterprise**	

	Dual, Hot-Plug, **Redundant Power Supply (1+1):** 1400W **Ready Rails:** Sliding Rails without Cable Management Arm. **Note: The participated bidder must have to quote against both of the types.**	
2.	**High End server for Lab** **Processor:** Dual Intel Xeon Silver 4310 or AMD EPYC 7313, Minimum 24 physical cores (48 threads). **Memory (RAM)**: 256 GB DDR4 ECC RAM (expandable to 512 GB) **Storage Configuration**: 1 x 1 TB SSD for OS, 2 x 4 TB HDD (RAID 1 or 5), Software RAID acceptable **Networking**: 2 x 10 GbE **Operating System**: Redhat Linux Enterprise **Chassis:** 2U Rack-mountable preferred. **Use Cases:** Local hosting of applications, storage, backups, or training resources.	

3.	**Multimedia Projects for Lab** **Model:** ViewSonic or equivalent **Display Type:** DLP **Resolution:** 3840 x 2160 (4K UHD) **Brightness:** 2400 LED Lumens **Light Source:** RGBB LED (lamp-free) **Lamp Life (Normal):** 30,000 hours **Contrast Ratio:** 3,000,000:1 **Throw Ratio:** 0.8 (short throw) **Projection Distance:** 0.5m – 3.2m (approx) **Screen Size:** 30" – 200" diagonal **Lens:** Fixed lens, manual focus **Keystone Correction:** Vertical ±40° **Aspect Ratio:** 16:9 (native), 4:3 compatible **Speakers:** Dual 8W Harman Kardon speakers **Smart Features:** Built-in Aptoide smart platform, Amazon Alexa, Google Assistant	
	Inputs: 2 x HDMI 2.0, USB-C, 2 x USB-A, MicroSD, Ethernet (LAN) **Outputs:** 3.5mm Audio Out, Optical Audio Out **Wireless Connectivity:** Wi-Fi (dual-band), Bluetooth **Weight:** 4.1 kg **Dimensions:** 261 x 271 x 166 mm (W x D x H) **Power Consumption:** 140W (typical) **Noise Level:** 26 dB (eco mode)	

4.	**Laser Printer for Lab** **Functions:** Print **First page out:** As fast as 6.1 sec **Resolution:** Up to 1200 x 1200 dpi **Monthly duty cycle:** Up to 80,000 pages **Monthly Page Volume:** 750 to 4,000 **Print Technology:** Laser **Display:** LED 2-line backlit LCD graphic display **Processor speed:** 1200 MHz **Automatic Paper Sensor:** Yes **Connectivity:** USB, Ethernet, WIFI **System Requirement:** MacOS, Microsoft Windows 11, 10, 8.1, 8, 7 **Memory:** 256 MB **Paper handling input:** 100-sheet multipurpose Tray 1, 250-sheet input Tray 2 **Paper handling output:** 150 sheet output bin **Media sizes support:** Letter, legal, executive, Oficio (8.5 x 13 in), 4 x 6 in, 5 x 8 in, envelopes (No 10, Monarch) **Print speed:** Upto 40 ppm **Warranty:** 1 year	
5.	**High End PCs for Lab** **Processor:** Intel Core i9 (12th Gen or newer) or AMD Ryzen Threadripper (32-core or above) **Memory (RAM)**: 32GB DDR4 RAM, ECC preferred	

	Storage Configuration: 1TB NVMe SSD, with read/write speeds exceeding 3000 MB/s **Networking**: 10GbE dual-port NIC with VLAN tagging and Jumbo Frame support **Operating System**: Pre-installed Redhat Linux with basic development packages (GCC, Python, Git) **Graphics**: NVIDIA RTX A2000 or higher, CUDA-enabled, with at least 6GB VRAM for acceleration of analog waveform processing and graphical layout rendering. **Monitor:** 27” FHD (1920x1080), with VESA mount compatibility	
6.	**FPGA kits for Lab** **FPGA Device:** High-end FPGA (Artix-7 Xilinx Artix-7, Basys 3 (Artix-7), Digilent Nexys A7, Digilent ZedBoard, Cora Z7 / Arty Z7, Nexys A7-100T, and similar) **Logic Elements:** 100,000+ **Embedded Memory:** Up to 8 MB Block RAM **DSP Slices:** 240+ DSP slices **I/O Pins:** 150+ **Clock Sources:** 100 MHz on-board oscillator, external clock input **Configuration Interface:** JTAG, USB-JTAG, QSPI **On-board Memory:** DDR3 (512MB to 1GB), QSPI Flash (128MB) **Programming Interface:** USB, JTAG, Serial debug **Supported Voltage Levels:** 1.2V, 1.8V, 2.5V, 3.3V **Expansion Connectors:** PMOD, FMC (low pin count), Arduino Shield header **Power Supply:** 5V DC or USB-C input **USB Interface:** USB 2.0 Device/Host, micro USB **On-board LEDs:** 16 User LEDs + Power, Status **Switches/Buttons:** 4 Push-buttons, 4 Slide Switches, Reset **Communication Interfaces:** UART, SPI, I2C, Ethernet (10/100/1000), CAN (optional) **Supported Standards:** RoHS, CE, FCC Class A	

	Development Software Support: Vivado Design Suite, Xilinx SDK, Petalinux (for SoC) **PCB Dimensions:** 110mm x 100mm (approx) **Operating Temperature Range:** 0°C to +70°C (Commercial Grade)	
7.	**High End UPS for Lab** **Minimum Backup Duration:** 15KV UPS to support up to 60 minutes full load backup for the entire lab (servers, switches, and workstations) **Topology:** Online or Line-Interactive UPS with Pure Sine Wave Output **Features:** SNMP/USB monitoring support, replaceable batteries, surge protection	
8.	**Networking Equipment for Lab** **Core Switch**: 10GbE Layer 2/3 managed switch, with a minimum of 04 SFP+ ports, full duplex, VLAN, QoS, and SNMPv3 support. **Access Switches**: 48-port Gigabit edge switches with PoE (optional), DHCP relay support, link aggregation (LACP) **Cabling:** CAT6A structured cabling, patch panels, and labeled patch cords for all nodes **Network Redundancy**: Support for dual-link redundancy, spanning tree protocol (STP), and hot-swappable transceivers	
9.	**Laptops** **Brand:** Lenovo or equivalent **Generation:** 13th Generation or higher **Processor Type:** Intel vPro with 13th Gen Intel Core i7 **Installed RAM:** 32 GB DDR5 or higher **Hard drive size:** 2 TB SSD NVMe or higher **Graphics:** NVIDIA® GeForce® MX550 4GB GDDR6 **Display:** 16″ WQXGA 4K (3840 x 2400) OLED with Dolby Vision®, 500 nits, antiglare / antireflective, 100% DCI-P3, Eyesafe® certified low blue light, certified Display HDR 400 or higher **Fingerprint Reader:** Yes **Keyboard:** Spill-resistant, TrackPoint & TrackPad 115mm / 4.53″, Numeric pad, Backlit with white LED lighting.	

	Ports/Slots: 2 x USB-C Thunderbolt™ 4, 2 x USB-A 3.2 Gen 1, HDMI (8K), Headphone / mic combo, Ethernet (RJ45) **Camera:** Camera privacy shutter or equivalent **Operating System:** MS Windows 11 Pro (Licensed) **Carry Case:** Yes **Warranty:** 1 Year	
10.	**Heavy Duty Colour Printers** **Functions:** Print **First page out black:** 5.7 sec **First page out color:** 5.7 sec **Resolution black:** Up to 1200 x 1200 dpi **Resolution color:** Up to 1200 x 1200 dpi **Monthly duty cycle:** Upto 120,000 pages **Print Technology:** Laser **Display:** LED **Processor speed:** 1.2 GHz **Automatic Paper Sensor:** Yes **Connectivity:** USB, Ethernet, WiFi **System Requirement:** MacOS, Microsoft Windows 11, 10, 8.1, 8, 7 - Linux **Memory:** 1 GB **Paper handling input:** 100-sheet multi-purpose tray, 550-sheet input tray 2, 3 **Paper handling output:** 500-sheet output bin **Media sizes support:** letter, legal, A4, A5, A6, envelopes (C5, DL) **Print speed black:** Upto 60 ppm **Print speed color:** Upto 60 ppm **Warranty:** 1 year	
11.	**Heavy Duty Printer (B&W)** **Functions:** Print	

	First page out: As fast as 6.1 sec **Resolution:** Up to 1200 x 1200 dpi **Monthly duty cycle:** Up to 80,000 pages **Monthly Page Volume:** 750 to 4,000 **Print Technology:** Laser **Display:** LED 2-line backlit LCD graphic display **Processor speed:** 1200 MHz **Automatic Paper Sensor:** Yes **Connectivity:** USB, Ethernet, WIFI **System Requirement:** MacOS, Microsoft Windows 11, 10, 8.1, 8, 7 **Memory:** 256 MB **Paper handling input:** 100-sheet multipurpose Tray 1, 250-sheet input Tray 2 **Paper handling output:** 150 sheet output bin **Media sizes support:** Letter, legal, executive, Oficio (8.5 x 13 in), 4 x 6 in, 5 x 8 in, envelopes (No 10, Monarch) **Print speed:** Upto 40 ppm **Warranty:** 1 year	
12.	**Heavy Duty Scanner** **Type:** Flatbed, ADF **Resolution, optical:** Hardware: 600 x 600 dpi; Optical: Up to 600 dpi **Scan Speed:** ADF: Up to 40 ppm / 80 ipm **Duplex ADF scanning:** Yes **ADF capacity:** Standard, 50 sheets **Scan size (flatbed), maximum:** ADF: 8.5 x 122 in Maximum; 2x2 in Minimum **Media types:** Paper (banner, inkjet, photo, plain), envelopes, labels, cards (greeting, index) **Output resolution dpi settings:** 75; 150; 200; 240; 300; 400; 500; 600; 1200 ppi **Memory:** Standard: 512 MB **Processor speed:** ARM-1176 666 MHz **Duty cycle (daily):** Recommended daily duty cycle: 4000 pages	

	OS Compatibility: Windows 11, 10, 8/8.1, 7, Mac OS X v10.9 (Mavericks), OS X v10.10 (Yosemite) **Connectivity, standard:** Ethernet 10/100 Base-T, USB 3.0, WiFi 802.11 b/g/n, WiFi Direct **Warranty:** 1 Year Local	
13.	**Photocopier** **Functions:** Print, Copy, Scan **Print Speed:** 45 ppm **Technology:** Laser Technology **Print Color:** Black mono **Print Resolution:** Print: 1200 x 1200, Copy: 600 x 600 **Paper size:** A3, A4, Letter, Legal **Duplex Printing:** Automatic Duplex Printing **DSDF:** Dual Scan Document Feeder with 290 Sheets Capacity minimum. **(RADF Not Acceptable**) **Interface Connection:** NETWORK Standard: 1000 Base-T/100Base-TX/10Base-T, **WIFI KIT MUST** **Monthly Duty Cycle:** 200,000 pages or higher **Processor speed:** 1.5 GHz Quad Core **Memory:** 5 GB RAM **System Storage:** 256 GB SSD **Display:** Min 10” LCD full functional touch screen display **Paper handling Input:** Standard: 500 x 2 Trays, By pass: 150 Sheets **Multiple Copies:** Up to 9,999 copies	
14.	**LED (75”)** **Brand:** TCL or Equivalent **Type:** Smart QLED TV **Screen Size:** 75 Inches **Resolution:** 4K Ultra HD (3840 x 2160) **Panel Type:** QLED (Quantum Dot) **Refresh Rate:** 144Hz Motion Clarity Pro	

	Smart TV Platform: Google TV **Processor:** AiPQ Pro Processor **Audio System:** ONKYO 2.1 Hi-Fi with Dolby Atmos or Equivalent **Connectivity:** Wi-Fi, HDMI x4, USB ports, Ethernet LAN **Energy Efficiency:** Optimized for low power consumption	
15.	**Wifi routers** **Model:** Mercusys or equivalent **Wi-Fi Standard:** Wi-Fi 6 (802.11ax) **Wi-Fi Speed:** AX3000 (2402 Mbps @5GHz + 574 Mbps @2.4GHz) **Bands:** Dual-band (2.4GHz & 5GHz) **MU-MIMO:** Yes, 2×2 MU-MIMO **OFDMA:** Yes **Beamforming:** Yes **Security:** WPA3, WPA2-PSK **Antenna Type:** High-gain fixed antennas **Number of Antennas:** 4 external antennas **LAN Ports:** 3 × Gigabit LAN **WAN Port:** 1 × Gigabit WAN **Total Gigabit Ports:** 4 **IPv6 Support:** Yes **Wireless Modes:** Router Mode, Access Point Mode **Mesh Support:** Yes (OneMesh compatible) **Operating Frequency:** 2.4GHz & 5GHz **Dimensions (W×D×H):** 208 × 171 × 41 mm **Power Supply:** 12V DC / 1.5A	

Part-B

Financial Proposal

19. Financial Proposal - Standard Forms

C1.	Financial Proposal submission form
C2.	Summary of costs

Note:- It is pertinent to mention that Financial Proposal and costing any item of this RFP shall not be the part of Technical Proposal, otherwise the bid will stand cancelled

C1- Financial Proposal Submission Form

To: Project Director

Pakistan Software Export Board

6th Floor New Statelife Building, Blue area, Islamabad

Islamabad, Pakistan

Tel: +92-51- 111 333 666

Fax: +92-51- 921-9075

Email: NSHRDP@pseb.org.pk

Sir,

We, the undersigned, offer to provide services for execution of "**Procurement of Software and Hardware for Training in Semiconductor Design National Semiconductor Human Resource Development Program (NSHRDP)"** project in accordance with your Request for Proposal dated. (Day , Month) 2025 and our Proposal (Technical and Financial Proposals). Our attached Financial Proposal is for the sum of [Amount in words and figures]. This amount is inclusive of all the local taxes, duties, fees, levies and other charges applicable on our company, our sub-contractors and collaborations under the Pakistani law.

Our Financial Proposal shall be binding upon us subject to the modifications resulting from Contract negotiations, up to expiration of the validity period of the Proposal, which is 180 calendar days from the date of advertisement.

We understand you are not bound to accept any Proposal you receive. We remain,

Yours sincerely,

Authorized Signature:

Name and Title of Signatory:

Name of Firm:

Address:

C2. – Summary of Costs

Particulars	Pak Rupees
Total	
All applicable Taxes	
Grand Total of Financial Proposal	

20. Bill of Quantity (BOQ) Lot – 1 Software

(Please mention vendor/manufacturer's name is the respective column)

Sr.#	**Item**	**Specification**	**Vendor/ Manufacturer**	**Unit Cost**	**GST**	**Total Cost**
1.	**Digital IC Design Flow (Tools**	RTL Simulation	Cadence, Synopsys, Siemens or equivalent			
		Synthesis	Cadence, Synopsys, Siemens or equivalent			
		Design for Testability (DFT)	Cadence, Synopsys, Siemens or equivalent			
		Logic Equivalence Check	Cadence, Synopsys, Siemens or equivalent			
		Physical Design	Cadence, Synopsys, Siemens or equivalent			
		Automatic Test Pattern Generation (ATPG)	Cadence, Synopsys, Siemens or equivalent			
		Timing and Power Analysis	Cadence, Synopsys, Siemens or equivalent			
		RC Extraction and Signoff	Cadence, Synopsys, Siemens or equivalent			
		Signoff Design Rule Check and LVS Layout vs. Schematic (DRC/LVS)	Cadence, Synopsys, Siemens or equivalent			
2.		Schematic Design	Cadence, Siemens, Synopsis, Altium, OrCAD			

	Analog & Mixed Signal IC Design Flow		CircuitMaker or equivalent			
		Layout Design &Floor Planning	Cadence, Siemens, Sysnopsis, Altium, Room sketcher or equivalent			
		Physical/Electrical Verification	Cadence, Siemens, Ikonix USA or equivalent			
		Parasitics Extraction	Cadence, Siemens or equivalent			
		Pre & Post Layout Simulation/ Verification	Siemens, Cadence, Ansys, or equivalent			
		Design Rule Check and LVS Layout vs. Schematic (DRC/LVS)	Cadence, Synopsys, Siemens or equivalent			
3.	**IC Design Verification Flow**	Linting	Cadence, Synopsys, Siemens or equivalent			
		UVM-based Verification	Cadence, Synopsys, Siemens or equivalent			
		Formal Verification	Cadence, Synopsys, Siemens or equivalent			
		Regression Analysis	Cadence, Synopsys, Siemens or equivalent			
4.		Keysight ADS	Cadence, Keysight, Anysys, FormFactor Inc.,			
		Cadence				
		Keysight SystemVue				
		Anysys HFSS				

	RFIC/MMIC Design	Keysight EMPro	MathWorks or equivalent			
		Cascade Microtech				
		KLayout				
		IVCAD				
5.	**PCB Design**	Schematic Capture	Cadence, Synopsys, or equivalent			
		Circuit Simulation	Cadence, Synopsys, or equivalent			
		PCB Layout	Cadence, Synopsys, or equivalent			
		In-Design Analysis for SI/PI, impedance, coupling, DFM.	Cadence, Synopsys, or equivalent			
		Documentation - automatically generated and kept in sync.	Cadence, Synopsys, or equivalent			

21. Bill of Quantity (BOQ) Lot – 2 Hardware

Sr.#	Item and Specifications	Qty	Unit Cost	GST	Total Cost
1.	**High End Server for EDA tools** **Option: I** **Processor:** 2 × Intel Xeon Gold/Platinum CPUs or higher (minimum 32 physical cores, 64 threads or more) **Memory (RAM)**: Minimum 256 GB DDR4 ECC RAM, scalable up to 1TB to support concurrent multi-user environments **Storage Configuration**: Primary Storage: 1TB NVMe SSD for OS and toolchain Secondary Storage: 10TB SAS/SATA HDD in RAID-10 configuration for EDA project data **Networking**: 10GbE dual-port NIC with VLAN tagging and Jumbo Frame support **Operating System**: RedHat Enterprise Linux (RHEL) **Virtualization Support**: Support for KVM, Docker, or containerized EDA workflows **Option-II** **Chasis**: With up to 8 Hard Drives **CPU**: Cache: 36MB, RAM: 256GB Dual Rank **Storage:** 1.92TB x 4, 2.5” SAS SSD **Raid Controller**: PERC H755 **DVD+/RW Rom,** **SATA NIC:** Broadcom 5720 Quad Port **GBE BASE-T** **rNDC, iDRAC9 Enterprise** **Dual, Hot-Plug,** **Redundant Power Supply (1+1):** 1400W **Ready Rails:** Sliding Rails without Cable Management Arm.	**01**			
2.	**High End server for Lab** **Processor:** Dual Intel Xeon Silver 4310 or AMD EPYC 7313, Minimum 24 physical cores (48 threads).				

	Memory (RAM): 256 GB DDR4 ECC RAM (expandable to 512 GB) **Storage Configuration**: 1 x 1 TB SSD for OS, 2 x 4 TB HDD (RAID 1 or 5), Software RAID acceptable **Networking**: 2 x 10 GbE **Operating System**: RedHat Enterprise Linux **Chassis:** 2U Rack-mountable preferred. **Use Cases:** Local hosting of applications, storage, backups, or training resources.	**03**			
3.	**Multimedia Projects for Lab** **Model:** ViewSonic or equivalent **Display Type:** DLP **Resolution:** 3840 x 2160 (4K UHD) **Brightness:** 2400 LED Lumens **Light Source:** RGBB LED (lamp-free) **Lamp Life (Normal):** 30,000 hours **Contrast Ratio:** 3,000,000:1 **Throw Ratio:** 0.8 (short throw) **Projection Distance:** 0.5m – 3.2m (approx) **Screen Size:** 30" – 200" diagonal **Lens:** Fixed lens, manual focus **Keystone Correction:** Vertical ±40° **Aspect Ratio:** 16:9 (native), 4:3 compatible **Speakers:** Dual 8W Harman Kardon speakers **Smart Features:** Built-in Aptoide smart platform, Amazon Alexa, Google Assistant **Inputs:** 2 x HDMI 2.0, USB-C, 2 x USB-A, MicroSD, Ethernet (LAN) **Outputs:** 3.5mm Audio Out, Optical Audio Out **Wireless Connectivity:** Wi-Fi (dual-band), Bluetooth **Weight:** 4.1 kg **Dimensions:** 261 x 271 x 166 mm (W x D x H) **Power Consumption:** 140W (typical) **Noise Level:** 26 dB (eco mode)	**03**			
4.	**Laser Printer for Lab** **Functions:** Print **First page out:** As fast as 6.1 sec **Resolution:** Up to 1200 x 1200 dpi **Monthly duty cycle:** Up to 80,000 pages				

	Monthly Page Volume: 750 to 4,000 **Print Technology:** Laser **Display:** LED 2-line backlit LCD graphic display **Processor speed:** 1200 MHz **Automatic Paper Sensor:** Yes **Connectivity:** USB, Ethernet, WIFI **System Requirement:** MacOS, Microsoft Windows 11, 10, 8.1, 8, 7 **Memory:** 256 MB **Paper handling input:** 100-sheet multipurpose Tray 1, 250-sheet input Tray 2 **Paper handling output:** 150 sheet output bin **Media sizes support:** Letter, legal, executive, Oficio (8.5 x 13 in), 4 x 6 in, 5 x 8 in, envelopes (No 10, Monarch) **Print speed:** Upto 40 ppm **Warranty:** 1 year	**03**			
5.	**High End PCs for Lab** **Processor:** Intel Core i9 (12th Gen or newer) or AMD Ryzen Threadripper (32-core or above) **Memory (RAM)**: 32GB DDR4 RAM, ECC preferred **Storage Configuration**: 1TB NVMe SSD, with read/write speeds exceeding 3000 MB/s **Networking**: 10GbE dual-port NIC with VLAN tagging and Jumbo Frame support **Operating System**: Pre- installed Redhat Linux with basic development packages (GCC, Python, Git) **Graphics**: NVIDIA RTX A2000 or higher, CUDA-enabled, with at least 6GB VRAM for acceleration of analog waveform processing and graphical layout rendering. **Monitor:** 27" FHD (1920x1080), with VESA mount compatibility	**105**			
6.	**FPGA kits for Lab** **FPGA Device:** High-end FPGA (Artix-7 Xilinx Artix-7, Basys 3 (Artix-7), Digilent Nexys A7, Digilent ZedBoard, Cora Z7 / Arty Z7, Nexys A7-100T, and similar)				

	Logic Elements: 100,000+ **Embedded Memory:** Up to 8 MB Block RAM **DSP Slices:** 240+ DSP slices **I/O Pins:** 150+ **Clock Sources:** 100 MHz on-board oscillator, external clock input **Configuration Interface:** JTAG, USB-JTAG, QSPI **On-board Memory:** DDR3 (512MB to 1GB), QSPI Flash (128MB) **Programming Interface:** USB, JTAG, Serial debug **Supported Voltage Levels:** 1.2V, 1.8V, 2.5V, 3.3V **Expansion Connectors:** PMOD, FMC (low pin count), Arduino Shield header **Power Supply:** 5V DC or USB-C input **USB Interface:** USB 2.0 Device/Host, micro USB **On-board LEDs:** 16 User LEDs + Power, Status **Switches/Buttons:** 4 Push-buttons, 4 Slide Switches, Reset **Communication Interfaces:** UART, SPI, I2C, Ethernet (10/100/1000), CAN (optional) **Supported Standards:** RoHS, CE, FCC Class A **Development Software Support:** Vivado Design Suite, Xilinx SDK, Petalinux (for SoC) **PCB Dimensions:** 110mm x 100mm (approx) **Operating Temperature Range:** 0°C to +70°C (Commercial Grade)	**60**			
7.	**High End UPS for Lab** **Minimum Backup Duration:** 15KV UPS to support up to 60 minutes full load backup for the entire lab (servers, switches, and workstations) **Topology:** Online or Line-Interactive UPS with Pure Sine Wave Output **Features:** SNMP/USB monitoring support, replaceable batteries, surge protection	**03**			
8.	**Networking Equipment (Router, Switches, LAN, Racks etc) for Lab**				

	Core Switch: 10GbE Layer 2/3 managed switch, with a minimum of 24 SFP+ ports, full duplex, VLAN, QoS, and SNMPv3 support. **Access Switches**: 48-port Gigabit edge switches with PoE (optional), DHCP relay support, link aggregation (LACP) **Cabling:** CAT6A structured cabling, patch panels, and labeled patch cords for all nodes **Network Redundancy**: Support for dual-link redundancy, spanning tree protocol (STP), and hot-swappable transceivers	**03**			
9.	**Laptops** **Brand:** Lenovo or equivalent **Generation:** 13th Generation or higher **Processor Type:** Intel vPro with 13th Gen Intel Core i7 **Installed RAM:** 32 GB DDR5 or higher **Hard drive size:** 2 TB SSD NVMe or higher **Graphics:** NVIDIA® GeForce® MX550 4GB GDDR6 **Display:** 16″ WQXGA 4K (3840 x 2400) OLED with Dolby Vision®, 500 nits, antiglare / antireflective, 100% DCI-P3, Eyesafe® certified low blue light, certified DisplayHDR 400 or higher **Fingerprint Reader:** Yes **Keyboard:** Spill-resistant, TrackPoint & TrackPad 115mm / 4.53″, Numeric pad, Backlit with white LED lighting. **Ports/Slots:** 2 x USB-C Thunderbolt™ 4, 2 x USB-A 3.2 Gen 1, HDMI (8K), Headphone / mic combo, Ethernet (RJ45) **Camera:** Camera privacy shutter or equivalent **Operating System:** MS Windows 11 Pro (Licensed) **Carry Case:** Yes **Warranty:** 1 Year	**12**			
10.	**Heavy Duty Colour Printers** **Functions:** Print **First page out black:** 5.7 sec **First page out color:** 5.7 sec **Resolution black:** Up to 1200 x 1200 dpi				

	Resolution color: Up to 1200 x 1200 dpi **Monthly duty cycle:** Upto 120,000 pages **Print Technology:** Laser **Display:** LED **Processor speed:** 1.2 GHz **Automatic Paper Sensor:** Yes **Connectivity:** USB, Ethernet, WiFi **System Requirement:** MacOS, Microsoft Windows 11, 10, 8.1, 8, 7 - Linux **Memory:** 1 GB **Paper handling input:** 100-sheet multi-purpose tray, 550-sheet input tray 2, 3 **Paper handling output:** 500-sheet output bin **Media sizes support:** letter, legal, A4, A5, A6, envelopes (C5, DL) **Print speed black:** Upto 60 ppm **Print speed color:** Upto 60 ppm **Warranty:** 1 year	**01**			
11.	**Heavy Duty Printer** **Functions:** Print **First page out:** As fast as 6.1 sec **Resolution:** Up to 1200 x 1200 dpi **Monthly duty cycle:** Up to 80,000 pages **Monthly Page Volume:** 750 to 4,000 **Print Technology:** Laser **Display:** LED 2-line backlit LCD graphic display **Processor speed:** 1200 MHz **Automatic Paper Sensor:** Yes **Connectivity:** USB, Ethernet, WIFI **System Requirement:** MacOS, Microsoft Windows 11, 10, 8.1, 8, 7 **Memory:** 256 MB **Paper handling input:** 100-sheet multipurpose Tray 1, 250-sheet input Tray 2 **Paper handling output:** 150 sheet output bin **Media sizes support:** Letter, legal, executive, Oficio (8.5 x 13 in), 4 x 6 in, 5 x 8 in, envelopes (No 10, Monarch) **Print speed:** Upto 40 ppm **Warranty:** 1 year	**05**			
12.	**Heavy Duty Scanner** **Type:** Flatbed, ADF **Resolution, optical:** Hardware: 600 x 600 dpi; Optical: Up to 600 dpi **Scan Speed:** ADF: Up to 40 ppm / 80 ipm				

	Duplex ADF scanning: Yes **ADF capacity:** Standard, 50 sheets **Scan size (flatbed), maximum:** ADF: 8.5 x 122 in Maximum; 2x2 in Minimum **Media types:** Paper (banner, inkjet, photo, plain), envelopes, labels, cards (greeting, index) **Output resolution dpi settings:** 75; 150; 200; 240; 300; 400; 500; 600; 1200 ppi **Memory:** Standard: 512 MB **Processor speed:** ARM-1176 666 MHz **Duty cycle (daily):** Recommended daily duty cycle: 4000 pages **OS Compatibility:** Windows 11, 10, 8/8.1, 7, Mac OS X v10.9 (Mavericks), OS X v10.10 (Yosemite) **Connectivity, standard:** Ethernet 10/100 Base-T, USB 3.0, WiFi 802.11 b/g/n, WiFi Direct **Warranty:** 1 Year Local	**01**			
13.	**Photocopier** **Functions:** Print, Copy, Scan **Print Speed:** 45 ppm **Technology:** Laser Technology **Print Color:** Black mono **Print Resolution:** Print: 1200 x 1200, Copy: 600 x 600 **Paper size:** A3, A4, Letter, Legal **Duplex Printing:** Automatic Duplex Printing **DSDF:** Dual Scan Document Feeder with 290 Sheets Capacity minimum. **(RADF Not Acceptable**) **Interface Connection:** NETWORK Standard: 1000 Base-T/100Base-TX/10Base-T, **WIFI KIT MUST** **Monthly Duty Cycle:** 200,000 pages or higher **Processor speed:** 1.5 GHz Quad Core **Memory:** 5 GB RAM **System Storage:** 256 GB SSD **Display:** Min 10” LCD full functional touch screen display **Paper handling Input:** Standard: 500 x 2 Trays, By pass: 150 Sheets **Multiple Copies:** Up to 9,999 copies	**01**			

14.	**LED (75")** **Brand:** TCL or Equivalent **Type:** Smart QLED TV **Screen Size:** 75 Inches **Resolution:** 4K Ultra HD (3840 x 2160) **Panel Type:** QLED (Quantum Dot) **Refresh Rate:** 144Hz Motion Clarity Pro **Smart TV Platform:** Google TV **Processor:** AiPQ Pro Processor **Audio System:** ONKYO 2.1 Hi-Fi with Dolby Atmos or Equivalent **Connectivity:** Wi-Fi, HDMI x4, USB ports, Ethernet LAN **Energy Efficiency:** Optimized for low power consumption	**01**			
15.	**Wifi routers** **Model:** Mercusys or equivalent **Wi-Fi Standard:** Wi-Fi 6 (802.11ax) **Wi-Fi Speed:** AX3000 (2402 Mbps @5GHz + 574 Mbps @2.4GHz) **Bands:** Dual-band (2.4GHz & 5GHz) **MU-MIMO:** Yes, 2×2 MU-MIMO **OFDMA:** Yes **Beamforming:** Yes **Security:** WPA3, WPA2-PSK **Antenna Type:** High-gain fixed antennas **Number of Antennas:** 4 external antennas **LAN Ports:** 3 × Gigabit LAN **WAN Port:** 1 × Gigabit WAN **Total Gigabit Ports:** 4 **IPv6 Support:** Yes **Wireless Modes:** Router Mode, Access Point Mode **Mesh Support:** Yes (OneMesh compatible) **Operating Frequency:** 2.4GHz & 5GHz **Dimensions (W×D×H):** 208 × 171 × 41 mm **Power Supply:** 12V DC / 1.5A	**03**			

Based on the availability of allocated funds, PSEB reserves the right to determine the exact quantity and category of equipment to be procured under this RFP. The procurement process will be guided by strategic priorities, institutional readiness, and alignment with project objectives. PSEB may choose to procure select hardware or software items from the proposed list depending on budgetary constraints and technical evaluations. This ensures optimal resource utilization while maintaining the flexibility to address emerging needs during project execution.

22. Annexures

Annexure-I - Integrity PACT

(To be submitted on Legal Stamp Paper for successful bidder only)

Affidavit

Tender Number: _________________

Date:____________________

Tender Value: ___________________

Tender Title: ___________________

[name of Firm] hereby declares that it has not obtained or induced the procurement of any contact, right, interest, privilege or other obligation or benefit from Government of Pakistan or any administrative subdivision or agency thereof or any other entity owned or controlled by it (GoP) through any corrupt business practice.

Without limiting the generality of the foregoing, [name of firm] represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside its affiliate , agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of contact, right, interest, privilege or other obligation or benefit in whatsoever form from Purchaser, except that which has been expressly declared pursuant hereto.

[The Firm/Contractor] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with the Purchaser and has not taken any action or will not take any action to circumvent the above declaration, representation or' warranty / support.

[The Firm/Contractor] accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty / support. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other right and remedies available to the Purchaser under any law, contract or other instrument, be voidable at the option of the Purchaser.

Notwithstanding any rights and remedies exercised by the Purchaser in this regard, [the Firm/Contractor] agrees to indemnify the Purchaser for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to the Purchaser in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder's fee or kickback given by [the Firm/Contractor] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from the Purchaser

____

Authorized Signature & Stamp

Subscribed and sworn to me this_________. Day of _______20_____

Verified by the Notary Public

Annexure-II –Undertaking for Bidders

(To be Provided on Judicial Stamp Paper)

It is hereby solemnly confirmed that the undertaking is submitted in respect of PSEB's tender titled "IT Industry Academia Bridge Program".

a. Declaration

It is to certify that I have read, clearly understood, and agreed upon to all the terms and conditions mentioned in the tender documents. Further, I certify that all of the information provided e.g. (certificates, etc.) in our bid is true and accurate and genuine. If at any stage the information provided is found to be false than I/We and my firm shall be held accountable, and our bid shall be rejected.

b. Statement for Non–Blacklisting

I, ____________________s/o Mr.________________, Designation of M/s ________________holding CNIC #__________________hereby confirms that our firm/company is not blacklisted by any Ministry / Division / Department of the Government / Semi government / Autonomous body of Federal or Provincial Government in Pakistan.

Annexure-III - Format for Performance Security Bond

PERFORMANCE BOND GUARANTEE Date________

To: Pakistan Software Export Board (PSEB)
6th Floor, New State Life Building Blue Area
Islamabad.

SIR,

1. Bank Guarantee Number:
2. Contract/Purchase Order No:
3. Name of Guarantor:
4. Address of Guarantor:
5. Amount of Guarantee in relevant currency:
6. Amount in words:
7. Date of Expiry of Guarantee:

Whereas your good self-have entered into Contract/Purchase Order No. with (vendor name with address) of hereinafter referred to as our customer and that one of the conditions of the Contract/Purchase Order is the submission of unconditional Bank Guarantee by our customer to your good self for a sum of (Amount in figure and words). In compliance with this stipulation of contract/Purchase Order, we hereby agree and undertake as under: -

a. To pay you unconditionally on demand and/or without any reference to our customer an amount not exceeding the sum of Rs/or relevant currency (amount in figure) as would be mentioned in your written Demand Notice.
b. To keep this Guarantee in force till (expiry date).
c. That we shall inform your office regarding termination of the validity of this Bank Guaranty one clear month before the actual expiry date of Guarantee.
d. That with the consent of our customer you may amend/alter any term/clause of contract/Purchase Order or add/delete any term/clause to/from this contract/Purchase Order without making any reference to us. We do not reserve any right to receive any such amendment/alteration or addition/deletion provided such like actions do not increase our monetary liability under this Bank Guaranty which shall be limited only to Rs/or relevant currency (Amount in figure and words).
e. That the Bank Guarantee herein before given shall not be affected by any change in the constitution of the Bank or Customer/Seller or Vendor. That this is unconditional Bank Guarantee, which shall be en-cashed on sight on presentation without any reference to our customer/seller or vendor. Bank Guarantee will not be released unless No Objection Certificate (NOC) is provided by Headquarter PSEB Procurement Department.

Authorized Signature/Stamp
Date______________________