



**Al-Khwarizmi Institute of Computer Science  
University of Engineering and Technology, Lahore**

**REQUEST FOR PROPOSALS  
Re-Tender**

**PROCUREMENT OF “AI CENTER”**

**(FOR Basis)**

**Estimated Price Rs. 4.63 Million**

**TENDER PRICE - Rs. 500/-**

**Late date of submission: January 9<sup>th</sup>, 2023 till 10:00 AM**

**FOR OFFICE USE ONLY**

**Serial No.** \_\_\_\_\_

**Sold to:- M/S** \_\_\_\_\_

**Date of Sale** \_\_\_\_\_ **Bank Challan No.** \_\_\_\_\_ **Date** \_\_\_\_\_



# Al-Khawarizmi Institute of Computer Science University of Engineering and Technology, Lahore

## TERMS AND CONDITIONS

### OVERVIEW

KICS, UET, Lahore intends to purchase the equipment and other required items. The supplier will be responsible for delivery, installation (if required), wherever required in KICS, UET, LAHORE.

#### 1. Proposal instructions (for BOQs in FOR)

- 1.1 Single stage / two envelope bidding procedure shall be applied in response to the RFP (Request for proposal). Each bid envelop shall comprise two envelopes containing, separately, financial proposal and technical proposal (if any) plus “legible documents”. The financials of bids found technically non responsive shall be returned unopened to the respective bidders.
- 1.2 Responding organizations shall deliver two sealed copies “one original and one photo copy” of the “FINANCIAL & TECHNICAL PROPOSAL” till January 9<sup>th</sup>, 2023 up till 10:00 am, each copy being physically separate, bound, sealed and labeled. Proposals will not be accepted after the due time & date. Proposal shall be delivered at the address given below before time.

DIRECTOR KICS,  
UNIVERSITY OF ENGINEERING AND TECHNOLOGY (UET),  
LAHORE. PHONE: (042)-99250247

- 1.3 Proposals received after the submission deadline will not be entertained under any circumstances and will be returned unopened to the submitting vendor. It is the sole responsibility of the participating vendor to ensure that the proposals are delivered before the deadline.

Any queries regarding this proposal should be directed to the designated contact person listed below:

#### **For Details:**

Mr. Muhammad A. Hassan  
Manager Procurement & Admin

Contact Number # 042-99029450  
Contact Number # 042 99250247



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- 1.4 Price should be mentioned on FOR basis.
- 1.5 The prices must be quoted item wise, in the same sequence given in the specification part of the tender document.
- 1.6 The original Request for Proposal documents duly signed and officially sealed by the bidder must be submitted in whole with the proposals. Any conditional, ambiguous, incomplete, supplementary or revised offer after the opening of Bidding shall not be entertained.
- 1.7 Any overwriting/crossing, etc. appearing in the offer may be properly signed by the person signing the Bidding. All pages of the Bidding must be properly signed. Offer with any overwriting and discrepancy shall not be accepted in any circumstances.
- 1.8 Warranty for all equipment's, as approved by the manufacturers/suppliers, should not be less than one year Labor and Service on site.
- 1.9 A call deposit equal to **2% (Rs.92,600) of the estimated bid price (mentioned in the tender)** should accompany the bidding document as **Earnest Money** drawn in favor of **Treasurer UET, Lahore**. The bidding document shall not be considered without Earnest Money. Bank guarantee will not be accepted. The earnest money will be released after signing the Agreement.
- 1.10 The Successful Bidder's bill will be deducted at a rate of 10% of the contract amount as **Performance Guarantee / Security Deposit**. The **Performance Guarantee / Security Deposit** will be returned after successful completion of Defect Liability/ Warranty Period, after repairing the defects in the equipment/ replacement found during the warranty period for FOR.
- 1.11 The Successful Bidder will deposit a blank stamp paper of value of 0.25% of the total offer/contract amount, purchased in the name of Director KICS (UET), Lahore.
- 1.12 Bidders are **allowed to submit Bids in partial.**
- 1.13 The quantity of an order may vary depending on the quoted prices and the allocated funds.



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- 1.14 The decision of the committee will be a binding on all concerned and can be appealed in the grievance committee.
- 1.15 KICS, UET, Lahore reserves the right to modify the conditions / specifications of the Bidding Document with written intimation to all the participants those who have purchased the Bidding Documents.
- 1.16 Delivery period will be (60) days from the date of issuance of purchase order/supply order.
- 1.17 Delivery, Installation and Training (where mentioned) be completed according to the agreed upon schedule of works.
- 1.18 In case the Bidders fails to execute the contract strictly in accordance with the terms and conditions laid down in the contract, the Security Deposit shall be forfeited and the equipment will be purchased at his own risk and expenses.
- 1.19 The equipment will be inspected at KICS, UET, LAHORE, and may get rejected if not found in accordance to the stated specifications.
- 1.20 KICS, UET, Lahore reserves the right to claim compensation for the losses caused by delay in the delivery of equipment i.e., 1% of contract amount on weekly basis.
- 1.21 It is the sole responsibility of the vendor to comply with local, national and international laws.
- 1.22 Successful bidders may be asked to bring their supplies for demonstration and specification test in the KICS, UET, LAHORE, at their own expenses and risk.
- 1.23 Where reference is made to any specific national or international standards, equal or higher quality will also be acceptable. In case, your offer conforms to standards other than quoted in the Bidding inquiry you are required to submit the followings along with your bid.
  - One copy of those standards in English
  - Evidence that the standards used is recognized and authoritative to ensure equal or higher quality.



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In case the bidder does not submit the required evidence and a copy of each of the standards, its Bid may not be considered.

- 1.24 In case any supplies/material is found not in conformity with the specifications provided in the Bidding, either on account of inferior quality, defective workmanship, faulty design, faulty packing or is short supplied, or wrongly supplied, the supplier will replace the same free of charges or pay the full cost of replacement.
- 1.25 The all proposals submitted will become the property of the University.
- 1.26 Possessing/Providing Dealership Certificate.

## **2. Evaluation Criteria**

All bids shall be evaluated on technical and financial responsiveness.

Technical evaluation process may include, but not limited to the consideration of the following with respect to the functional requirements given ahead:

- 2.1. Technical specifications of proposed equipment's
- 2.2. Best warranty of the equipment

Financial Evaluation process may include, but not limited to the consideration of the following:

- 2.3 Quoted price
- 2.4 CDR (5% of estimated price mentioned in the tender)

## **3 Required Information**

Bidders are required to include the following documents/information in their technical proposals (all documents should be duly signed and stamped)

- i. The Name and Address
- ii. Profile of company (Including Financial Profile)
- iii. List of Previous/Current customer of related equipment's, with contact person and telephone/fax#
- iv. Detailed product information/brochures
- v. Detailed product warranty/guarantee information



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- vi. Attested copy of National Tax Registration Certificate
- vii. Attested copy of Sales Tax Registration Certificate
- viii. Detailed backup support plan
- ix. Bank letter of financial standing
- x. An Affidavit on Rs.100/- Stamp paper that currently they are not black listed or debarred by any Government/Semi Government department to participate in bidding and to supply equipment. Failure to submit such affidavit may lead to disqualification.
- xi. Any additional information the bidder may like to furnish e.g. repair/maintenance workshop owned by supplier and other concerned facility
- xii. Dealership Certificate.

In addition to the above, the proposal must include the following in the order given below:

- i. Detailed equipment specifications, proposed quantities duly filled on the Performa attached with this document
- ii. Detailed project implementation schedule which includes the delivery of equipment
- iii. Terms and Conditions
- iv. Equipment prices (FOR) duly entered.
- v. Validity period of the quoted price, i.e. 60 days
- vi. Educational discounts if available/applied to the quoted price

#### **4 Terms and Conditions (FOR Basis)**

- 4.1 All prices should be in PAK rupees exclusive of Taxes. GST and /or other Tax amount where applicable should be mentioned in separate column(s) and the total given in a separate column.



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- 4.2 All prices should be valid for at least 60 days. Withdrawal or any modification of the original offer within the validity period shall entitle KICS, UET, LAHORE to forfeit the earnest money in favor of the KICS, UET, LAHORE and/or putting a ban on the future inquires or taking any other suitable action against the bidder.
- 4.3 Delivery of the items will be free of charge at the KICS, UET, LAHORE during the office hours with a copy of delivery challan.
- 4.4 Items being ordered should be brand new and according to order specification from the current production and covered under normal warranty/guarantee etc. as mentioned in the proposal. Brochures of the product details must be attached.

Name of Vendor.....

Authorized person.....

Authorized Signature.....

Stamp.....

Office address.....

Tel No.....

Fax No.....

(The filled in Bidding Document should be forwarded to KICS, UET, Lahore with covering letter).



## Al-Khawarizmi Institute of Computer Science University of Engineering and Technology, Lahore

### Technical Specifications (Equivalent Or Higher) FOR BASIS

Sr.	Description	Estimated Amount in Million (PKRs)
1	VOIP Router and Recorder	0.2
2	High Quality Large Display screens	0.35
3	Tablets for Testing	0.3
4	Sound Producing Equipment High Quality	0.15
5	Pen Tablets	0.5
6	Night Vision Cameras	0.2
7	Development Board	0.2
8	IMU sensors	0.05
9	Digital Sound Mixer and Voice Changer	0.2
10	Game Development software pro	0.2
11	Tracking Equipment (Indoor/Outdoor)	0.08
12	Smart Sensors	1
13	Smart Switches	1.2
<b>Estimated Total Equipment Cost Rs Million</b>		<b>4.63 M</b>



## Technical Specification (Equivalent or Higher)

Sr. No	Description	Amount in Million (PKRs)	Quantity	Technical Specification	Description
1	VOIP Router and Recorder	0.2	3	VOIP Router: 1. Dual Gigabit Ethernet WAN ports for failover and load-balancing 2. Two USB 2.0 ports for connection to Two 3G/4G LTE USB modems, FTP server and network printer 3. Fifty VPN tunnels with comprehensive secure protocols 4. Advanced VPN load-balancing and site-to-site backup functions 5. Integrated IEEE 802.11ac wireless Access Point; dual band; up to 1300Mbps throughput 6. Supports Central Management system for multi-site deployment 7. VoIP (2 x FXS and 1 x FXO Line Port) 8. Object-based Firewall and CSM (Content Security Management) for network security 9. Multiple VLANs provide secure and efficient workgroup management 10. Five Gigabit LAN ports with multiple subnets 11. Embedded Central VPN Management for 8 remote Vigor routers 12. Embedded Central AP Management for Vigor wireless Access Points	For call recording and monitoring and for the voice analysis
2	High Quality Large Display Screens	0.35	10	32" LED TV 1080p	For display of video data and live streams.
3	Tablets for Testing	0.3	1,1	1. Android Tab or equivalent <ul style="list-style-type: none"> <li>● Android 7.0</li> <li>● Processor</li> <li>● Processor Speed, Type</li> <li>● Quad Core(2.15 GHz + 1.6 GHz Quad), Qualcomm APQ8096</li> <li>● Wi-Fi yes</li> <li>● Weight: 0.95 lbs</li> <li>● Product Dimensions (inches)</li> </ul>	For testing of different applications

				<ul style="list-style-type: none"> <li>● 9.34" x 6.65" x 0.24"</li> <li>● Camera resolution (Front): 5MP FF</li> <li>● Camera resolution (Rear): 13MP AF with Flash</li> <li>● Digital Optical Zoom X8 (Digital)</li> <li>● F1.9 (Rear) / F2.2 (Front)</li> <li>● Battery Type and Size:Li-Ion 6000mAh</li> <li>● ENERGY STAR® Certified: Yes</li> <li>●</li> <li>● Internal Memory: 4GB(RAM) + 32 GB</li> <li>● External Memory/microSD™ Capacity: microSD up to 400GB</li> <li>● USB Type-C (3.1)</li> <li>● Bluetooth v4.2</li> <li>● Bluetooth Profiles:A2DP,AVRCP,DI,HFP,HID,HOGP,HSP,MAP,OPP,PAN,PBAP</li> <li>● Earjack:3.5mm Stereo</li> <li>● Wi-Fi Direct:Yes</li> <li>● Display: Main Display Resolution 2048 x 1536 (QXGA)</li> <li>● Main Display Size: 9.7"</li> <li>● Main Display Technology: Super AMOLED</li> <li>● S Pen Support: Yes (Included)</li> <li>● Audio Streaming, Music Player</li> <li>● Audio Playing Format: MP3,M4A,3GA,AAC,OGG,OGA,WAV,WMA,AMR,AWB,FLAC,MID,MIDI,XMF,MXMF,IMY,RTTTL,RTX,OTA</li> <li>● Speaker: Quad Speakers (DSL Type 1709 3.0t)</li> <li>● Video Streaming, Video Player</li> <li>● Video Playing Format: MP4, M4V, 3GP, 3G2, WMV, ASF,AVI,FLV,MKV,WEBM</li> <li>● Sensor Type: Accelerometer,Fingerprint Sensor,Gyro Sensor,Geomagnetic Sensor,Hall Sensor,RGB Light Sensor</li> <li>● Power Adapter</li> </ul> <p>2. Tablet (Apple 8<sup>th</sup> gen or equivalent)</p> <ul style="list-style-type: none"> <li>● Technology GSM / CDMA / HSPA / EVDO / LTE</li> <li>● Dimensions 240 x 169.5 x 7.5 mm (9.45 x 6.67 x 0.30 in)</li> <li>● Weight 469 g (Wi-Fi) / 478 g (LTE) (1.05 lb)</li> </ul>	
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				<ul style="list-style-type: none"> <li>● Front glass, aluminum body</li> <li>● Nano-SIM/ Electronic SIM card (Apple e-SIM)</li> <li>● - Stylus support</li> <li>● LED-backlit IPS LCD, capacitive touchscreen, 16M colors</li> <li>● Size 9.7 inches, 291.4 cm<sup>2</sup> (~71.6% screen-to-body ratio)</li> <li>● Resolution 1536 x 2048 pixels, 4:3 ratio (~264 ppi density)</li> <li>● Multitouch: Yes</li> <li>● Protection: Scratch-resistant glass, oleophobic coating</li> <li>● OS: iOS 11.3</li> <li>● Chipset: Apple A10 Fusion</li> <li>● CPU:Quad-core 2.34 GHz (2x Hurricane + 2x Zephyr)</li> <li>● GPU:PowerVR Series7XT Plus (six-core graphics)</li> <li>● Internal 32 2 GB RAM</li> <li>● CAMERA Primary 8 MP (f/2.4, 31mm, 1.12 μm), autofocus Geo-tagging, touch focus, face/smile detection, HDR (photo/panorama)</li> <li>● Video 1080p@30fps, 720p@120fps, HDR, stereo sound rec. Secondary 1.2 MP (f/2.2, 31mm), 720p@30fps, face detection, HDR, FaceTime over Wi-Fi or Cellular</li> <li>● Loudspeaker Yes, with stereo speakers 3.5mm jack - Active noise cancellation with dedicated mic</li> <li>● WLAN Wi-Fi 802.11 a/b/g/n/ac, dual-band, hotspot Bluetooth 4.2, A2DP, EDR, LE</li> <li>● GPS Yes, with A-GPS, GLONASS (Wi Fi + Cellular model only)</li> <li>● USB 2.0, proprietary reversible connector</li> <li>● Sensors Fingerprint (front-mounted), accelerometer, gyro, compass, barometer</li> <li>● iMessage, Email, Push Email, IM, Browser</li> <li>● HTML5 (Safari)- Siri natural language commands and dictation - iCloud cloud service - MP3/WAV/AAX+/AIFF/Apple Lossless player - MP4/H.264 player - Audio/video/photo editor - Document editor</li> <li>● Non-removable Li-Ion battery (32.4 Wh)</li> <li>● Talk time Up to 10 h (multimedia)</li> </ul>	

4	Sound Producing equipment High Quality	0.15	1	<p>General Features</p> <p>POWER OUTPUT 1000W</p> <p>BLUETOOTH Yes</p> <ul style="list-style-type: none"> <li>• 1080P UPSCALER Yes</li> <li>• SLEEP Yes</li> <li>• SCREEN SAVER Yes</li> <li>• AUTO POWER OFF (AUTO STAND-BY)Yes</li> <li>• Video / Audio / Photo Playback</li> <li>• DVD Yes</li> <li>• CD Yes</li> <li>• USB FILE SYSTEM (FAT32, NTFS) Yes(FAT12/16/32)</li> <li>• Audio Decoding</li> <li>• LPCM (2CH / 5.1CH / 7.1CH) LPCM (2ch)</li> <li>• DOLBY® DIGITAL Yes</li> <li>• DOLBY® PROLOGIC Yes</li> </ul>	For producing and analysis of voice, call and audio etc
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5	Pen Tablets	0.5	1,1,2	<p>Pen Tablet (Apple or equivalent)</p> <ul style="list-style-type: none"> <li>● 2.8GHz quad-core 7th-generation Intel Core i7 processor</li> <li>● Turbo Boost up to 3.8GHz</li> <li>● 16GB 2133MHz LPDDR3 memory</li> <li>● 256GB SSD storage1</li> <li>● Radeon Pro 555 with 2GB memory</li> <li>● Four Thunderbolt 3 ports</li> <li>● Touch Bar and Touch ID</li> <li>● Battery and Power: Up to 10 hours wireless web</li> <li>● Up to 10 hours iTunes movie playback</li> <li>● Up to 30 days of standby time</li> <li>● Built-in 76.0-watt-hour lithium-polymer battery</li> <li>● 87W USB-C Power Adapter</li> </ul> <p>Pen Tablet (Android or equivalent)</p> <ul style="list-style-type: none"> <li>● Up to 8th Generation Intel® Core™ i7-8550U Processor (1.80GHz 8MB)</li> <li>● 7th Generation Intel® Core™ i7-7500U Processor (2.70GHz 4MB)</li> <li>● Operating System Windows 10 Home</li> <li>● Display ? 15.6" FHD (1920 x 1080) IPS Anti-Glare Multitouch with integrated camera</li> <li>● Graphics</li> <li>● Intel® UHD Graphics 620</li> <li>● Intel® HD Graphics 620</li> <li>● Camera HD 720p</li> <li>● Memory ? Up to 16GB DDR4 2133 MHz</li> <li>● Storage ?</li> <li>● Up to 1TB 5400 RPM</li> <li>● Up to 512GB PCIe SSD</li> <li>● Battery FHD Models: Up to 10.5 hours</li> <li>● Active Pen No Active Pen</li> <li>● Audio</li> <li>● Harman speaker</li> <li>● Dolby® Audio Premium</li> <li>● Security Fingerprint reader with Windows Hello</li> <li>● Ports</li> </ul>	For Software development and testing purpose
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				<ul style="list-style-type: none"> <li>● 2 x USB 3.0 (1 x charger)</li> <li>● USB Type-C</li> <li>● Card reader</li> <li>● HDMI</li> <li>● Audio jack</li> <li>● WiFi ? 802.11 AC (2 x 2) WiFi + Bluetooth® 4.1</li> </ul> <ul style="list-style-type: none"> <li>● Weight Starting at 4.4 lbs (2 kg)</li> <li>● Colors Black</li> </ul> <p>Pen Tablet (Wacom Cintiq Pro or Equivalent)</p> <ul style="list-style-type: none"> <li>● Screen size: 13.3 in (33.8 cm) (diagonal)</li> <li>● Size: 360 x 235 x 13.9mm (14.2 x 9.3 x .55 in)</li> <li>● Color performance: 16.7 million colors; 87% Adobe RGB</li> <li>● Resolution: Full HD (1920 x 1080)</li> <li>● Pen pressure levels: 8192</li> <li>● Pen tilt</li> <li>● ExpressKeys™: 17 on optional ExpressKey Remote</li> <li>● Multi-touch: yes</li> <li>● Pen stand</li> <li>● Integrated pop-out legs for 20 degree angle</li> <li>● 3 position optional adjustable stand</li> <li>● Compact slim design</li> </ul>	
6	Night vision cameras	0.2	1	<ul style="list-style-type: none"> <li>● Starlight technology</li> <li>● 1080P @ 30 FPS; 1920 × 1080</li> <li>● Detect: up to 125 ft</li> <li>● Recognize: up to 75 ft</li> <li>● Identify: up to 50 ft</li> <li>● Alarm Input and Output</li> <li>● Audio Input and Output</li> <li>● Micro-SD Card Slot</li> <li>● Temperature rated from -40°F to 140 °F</li> <li>● Humidity rated between 10 and 95%</li> </ul>	For recording videos and making our own datasets
7	Development boards	0.2	5	Jetson Nano 1. 4GB Ram	Embedded System

					Development
8	IMU Sensors	0.05	2	Inertial measurement Sensor <ul style="list-style-type: none"> <li>● Mode               <ul style="list-style-type: none"> <li>– Logging (data is saved in local memory) sensor</li> <li>– Streaming (data is sent live to your device) sensor</li> </ul> </li> <li>● Connectivity               <ul style="list-style-type: none"> <li>– Bluetooth LE 4.2 – 2.4Ghz</li> <li>– Up to 100ft of range – typical 10m</li> <li>– Stream sensor Data from 1 Hz to 100 Hz</li> <li>– Log sensor Data from 1 Hz to 400 Hz</li> </ul> </li> </ul>	Required for recording a range of biomedical signals in the lab wirelessly. Body sensor networks have many applications in human activity

				<ul style="list-style-type: none"> <li>● Core <ul style="list-style-type: none"> <li>– Nordic nRF52 32-bit ARM® Cortex™ M4F CPU</li> <li>– 512kB flash + 64kB RAM</li> <li>– RGB LED</li> <li>– Micro push-button</li> <li>– I2C + 4 GPIOs</li> </ul> </li> <li>● Logging / Memory <ul style="list-style-type: none"> <li>– Streaming AND Logging Sensor</li> <li>– 8MB NOR FLASH – Off board</li> <li>– 100K – 500K sensor data entries with timestamps</li> </ul> </li> <li>● Battery <ul style="list-style-type: none"> <li>– 200 – 220mAH CR2032 Coin cell battery – not rechargeable (included)</li> </ul> </li> <li>● Accelerometer <ul style="list-style-type: none"> <li>– Accelerometer (A): 16 bit</li> <li>– ±2g: 16384LSB/g</li> <li>– ±4g: 8192LSB/g</li> <li>– ±8g: 4096LSB/g</li> <li>– ±16g: 2048LSB/g</li> <li>– Noise density (typ.): 180 µg/√Hz</li> </ul> </li> <li>● Gyroscope <ul style="list-style-type: none"> <li>– Gyroscope (G): 16bit</li> <li>– ±125°/s: 262.4 LSB/°/s</li> <li>– ±250°/s: 131.2 LSB/°/s</li> <li>– ±500°/s: 65.6 LSB/°/s</li> <li>– ±1000°/s: 32.8 LSB/°/s</li> <li>– ±2000°/s: 16.4 LSB/°/s</li> <li>– Noise density (typ.): 0.008 °/s/√Hz</li> </ul> </li> <li>● Magnetometer <ul style="list-style-type: none"> <li>– Magnetometer(T): 16bit</li> <li>– ±1300µT (x,y-axis) range</li> <li>– ±2500µT (z-axis) range</li> <li>– Resolution: 0.3µT</li> </ul> </li> <li>● Pressure <ul style="list-style-type: none"> <li>– Barometer(Pa): 16bit</li> </ul> </li> </ul>	<p>recognitions, assistive technologies, and healthcare</p>
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				<ul style="list-style-type: none"> <li>- 300...1100 hPa</li> <li>- Resolution: 0.01 hPa (&lt; 10 cm if calibrated)</li> <li>● Sensor Fusion <ul style="list-style-type: none"> <li>- Advanced 9-axis sensor fusion algorithms</li> <li>- Fast in-use background calibration of all sensors and calibration monitor</li> <li>- Enhanced magnetic distortion detection and suppression</li> <li>- Real-time motion tracking due to built-in group delay compensation</li> <li>- Gyroscope drift cancellation</li> </ul> </li> <li>● - Supports various power modes for switching on/off sensors and algorithm modules</li> </ul>	
9	<b>Digital sound mixer and Voice changer</b>	0.2	1	1) Roland VT-4 Sound Transformer	working with sound and speech signals for crime investigation
10	<b>Game Development softwares pro</b>	0.2	1	<ul style="list-style-type: none"> <li>● Unity Professional Bundle</li> <li>● Corona Professional Bundle</li> <li>● Apple Developer Account</li> </ul>	For generating gaming and virtual environments
11	<b>Tracking equipment (Indoor/Outdoor)</b>	0.08	1	<b>Pozyx Ready to Localize or equivalent</b> <ul style="list-style-type: none"> <li>● Accurate 2D and 3D indoor and outdoor positioning</li> <li>● Accurate motion sensing (using 9-axis sensor fusion)</li> <li>● Accurate ranging with the anchors</li> <li>● Arduino and Raspberry pi compatible</li> <li>● Simple installation</li> <li>● Wireless communication between all devices</li> <li>● Position Accuracy 10 cm</li> <li>● Update Rate: 140 Hz.</li> </ul>	For tracking humans
12	<b>Smart Sensors</b>	1	1, 4	<ol style="list-style-type: none"> <li>1. LIDAR TF02 (ToF) Laser Rangefinder or equivalent Detection Range: 0.3-10m, Power: 5VDC, &lt;200ma, Interface: UART/CAN, Measuring Speed: Default 100Hz (maximum: 500Hz)</li> <li>2. Human Activity Sensing device</li> </ol> <b>Engine Specs:</b> <ul style="list-style-type: none"> <li>● 3584NVIDIA CUDA® Cores or equivalent</li> <li>● 1582Boost Clock (MHz)</li> </ul>	Motion, temperature, acoustic sensors etc

			<p><b>Memory Specs:</b></p> <ul style="list-style-type: none"><li>● 11 GbpsMemory Speed</li><li>● 11 GB GDDR5XStandard Memory Config</li><li>● 352-bitMemory Interface Width</li><li>● 484Memory Bandwidth (GB/sec)</li></ul> <p><b>Technology Support:</b></p> <ul style="list-style-type: none"><li>● YesSimultaneous Multi-Projection</li><li>● YesVR Ready</li><li>● YesNVIDIA Ansel</li><li>● Yes - SLI HB Bridge SupportedNVIDIA SLI® Ready1</li></ul>	
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				<ul style="list-style-type: none"> <li>● YesNVIDIA G-SYNC™-Ready</li> <li>● YesNVIDIA GameStream™-Ready</li> <li>● 3.0NVIDIA GPU Boost™</li> <li>● 12 API with feature level 12_1Microsoft DirectX</li> <li>● YesVulkan API</li> <li>● 4.5OpenGL</li> <li>● PCIe 3.0Bus Support</li> <li>● Windows 7-101, Linux, FreeBSDx86OS Certification</li> </ul> <p><b>Display Support:</b></p> <ul style="list-style-type: none"> <li>● 7680x4320@60HzMaximum Digital Resolution2</li> <li>● DP 1.43, HDMI 2.0bStandard Display Connectors</li> <li>● YesMulti Monitor</li> <li>● 2.2HDCP</li> </ul> <p><b>Graphic Card Dimensions:</b></p> <ul style="list-style-type: none"> <li>● 4.376"Height</li> <li>● 10.5"Length</li> <li>● 2-SlotWidth</li> </ul> <p><b>Thermal and Power Specs:</b></p> <ul style="list-style-type: none"> <li>● 91Maximum GPU Temperature (in C)</li> <li>● 250 WGraphics Card Power (W)</li> <li>● 600 WRecommended System Power (W)4</li> <li>● One 6-pin, One 8-pin Supplementary Power Connectors</li> </ul>	
13	Smart Switches	1.2	1) 2 2)2 3)6	1. Amazon Echo Plus or equivalent <ul style="list-style-type: none"> <li>● 9.2" x 3.3" x 3.3" dimensions</li> <li>● 33.6 Oz weight</li> <li>● Control smart home devices</li> <li>● Streaming wifi music</li> <li>● Play videos</li> <li>● Dual speakers with romm0-filling sound</li> <li>● Line-out with 3.5mm cable or Bluetooth</li> <li>● 2.5" woofer and 0.8" tweeter</li> </ul> 2. Amazon Echo Spot or equivalent <ul style="list-style-type: none"> <li>● 1.3" x 3.3" x 3.3" dimensions</li> <li>● 5.7 Oz weight</li> </ul>	Switches for recording automatic breach data and behavior analysis

			<ul style="list-style-type: none"> <li>4)10</li> <li>5)10</li> <li>6)10</li> <li>7)15</li> <li>8)15</li> </ul>	<ul style="list-style-type: none"> <li>• Control smart home devices</li> <li>• Streaming wifi music</li> <li>• Play videos</li> <li>• Dual speakers with romm0-filling sound</li> <li>• Line-out with 3.5mm cable or Bluetooth</li> <li>•</li> </ul> <p>3. Home Automation Hub</p> <ul style="list-style-type: none"> <li>• Supports ZigBee, WiFi, Z-Wave, Bluetooth</li> <li>• Backup Power source available</li> <li>• Ethernet capable</li> <li>• 512 MB memory</li> <li>• 600 Simultaneous Pairable devices</li> <li>• Amazon Alexa compatible</li> <li>• Google Assistant compatible</li> <li>• Timing scheduling capable</li> </ul> <p>4. 600W smart switch board (4 channels)</p> <p>5. 1000W smart switch board (4 channels)</p> <p>6. 3000W smart switch</p> <p>7. 1000W smart dimmer (2 channels)</p> <p>8. 1200W smart plug</p> <p>Smart switches specifications:</p> <ul style="list-style-type: none"> <li>• Amazon Alexa compatible</li> <li>• Google Assistant compatible</li> <li>• Timing scheduling capable</li> <li>• Supports Mobile Application based control</li> <li>• Wifi capable</li> <li>• Supports high-power loads</li> </ul>	
<b>ESTIMATED TOTAL EQUIPEMNT COST PKR</b>					<b>4.63</b>
					<b>million</b>