Information Technology Laboratory at Uzbekistan Armed Forces Academy, Tashkent, Uzbekistan

(By Embassy of India, Tashkent, Uzbekistan)

May 2022

Tender Document

Supply, Installation and Commissioning of IT Hardware & Software for Setting up of an Information Technology Laboratory at Uzbekistan Armed Forces Academy, Tashkent, Uzbekistan

Tender No.: TAS/DW/109/ITLAB/2022

Last date for submission of bids: 15th June 2022 till 1730 hours

Opening of technical bids: 20th June 2022 at 1100 hours

The tender document is available for downloading at
www.eoi.gov.in/tashkent

TABLE OF CONTENTS

SECTION I: INSTRUCTIONS FOR ONLINE BID SUBMISSION

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal. More information useful for submitting online bids on the CPP Portal may be obtained at:

1. Registration

a. Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL:) by clicking on the link "**Online Bidder Enrolment**" on the CPP Portal, which is free of charge.

b. As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.

c. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.

d. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify/ nCode / eMudhra etc.), with their profile.

e. Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others, which may lead to misuse.

f. Bidder then logs in to the site through the secured login by entering their user ID / password and the password of the DSC / e-Token.

2. Searching for Tender Documents

a. There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.

b. Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.

c. The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

3. Preparation of Bids

a. Bidder should take into account any corrigendum published on the tender document before submitting their bids.

b. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.

c. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option, which helps in reducing size of the scanned document.

d. To avoid the time and effort required in uploading the same set of standard documents, which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" or ''Other Important Documents'' area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

4. Submission of Bids

a. Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.

b. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.

c. Bidder has to select the payment option as "offline" to pay the tender fee / Bid Security Declaration as applicable and enter details of the instrument.

d. Bidder should prepare the Bid Security Declaration as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.

e. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white colored (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BOQ file is found to be modified by the bidder, the bid will be rejected.

f. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

g. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

h. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

i. Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid number and the date & time of submission of the bid with all other relevant details.

j. The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

5. Assistance to Bidders

a. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.

b. Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk.

END OF SECTION I

SECTION II: INVITATION FOR BIDS (IFB)

Embassy of India, Tashkent invites Online Bids on single stage two-bid system for Supply, Installation and Commissioning of IT Hardware & Software for setting up of an Information Technology Laboratory at Uzbekistan Armed Forces Academy, in Tashkent, Uzbekistan. **Please note that physical bids shall not be accepted.**

1. Contact information

Head of Chancery
Embassy of India, 16, Kara-Bulak Street, Mirzo Ulugbek District
Tashkent, Uzbekistan – 100052
Telephone : 998-781400983/997/998

2. Critical Date Sheet

Tender documents may be downloaded from www.eoi.gov.in/tashkent and www.mea.gov.in (for reference only) and https://eprocure.gov.in/eprocure/app as per the critical date sheet below:

Published Date	06 May 2022 (1000 Hours)
Bid Document Download/ Sale Start Date	06 May 2022 (1000 Hours)
Online Clarification Start Date	10 May 2022 (1000 Hours)
Online Clarification End Date	20 May 2022 (1000 Hours)
Pre Bid meeting	01 June 2022 (1000 Hours)
Bid Submission Start Date	06 May 2022 (1000 Hours)
Bid Submission End Date	15 June 2022 (1730 Hours)
Technical Bid Opening Date	20 June 2022 (1100 Hours)

Note: This is according to IST (Indian Standard Time)

3. Two Bid System

The two bid system will be followed for this e-tender. In this system, the bidder shall submit his offer online in two parts viz. Technical Bid and Commercial Bid. The offers submitted by telegram/ fax/ e-mail/ by hand or any other mode except e-tender shall not be accepted. No correspondence will be entertained in this matter.

Part 1: "Technical Bid" shall be uploaded in the form of following documents:

a. Copy of Tender Fee (Non-Refundable) in the form of **Demand Draft** for **INR 2000/-** drawn on any **Nationalized/ Scheduled Bank**, in favour of **'**Embassy of India, Tashkent **'** payable at New Delhi. The original instrument in respect of Tender Fee must be submitted to Embassy of India, Tashkent on the address mentioned above on or before last date/time of bid submission as mentioned in critical date sheet. The Demand Draft submitted towards tender fee shall be non-refundable. Copy of **Bid Security Declaration.** The original **Bid Security Declaration** must be submitted to Embassy of India, Tashkent on the address mentioned above on or before last date/time of bid submission as mentioned in critical date sheet. **In case of non-submission of original Bid Security Declaration and tender fee, the bid shall be rejected. The Demand Draft submitted towards tender fee is non-refundable.**

b. Duly filled Technical Bid with proper seal and signature of authorised person on each page of the bid submitted. The person signing the bid should be the duly authorised representative of the Firm/ Company whose signature should be verified and certificate of authority should be scanned and submitted as per format given at ***Annexure I***. The power or authorisation or any other document consisting of adequate proof of the ability of the signatory to bind the firm/ company should be scanned and annexed to the bid.

c. Copy of Supply Orders/ Contracts/ Agreements for similar work, executed by the bidders in last Five years ending March 31, 2022. The bidder should submit the completion certificate duly issued by the end user. The bidder should have completed at least **ONE** similar work not less than **INR 30 Million** OR **TWO** similar works not less than **INR 15 Million** each OR **THREE** similar works not less than **INR 10 Million** each. The similar work means supply, installation, integration and on-site support of all/ most of the items mentioned in this tender document in a single project on turnkey basis in India/ abroad. **The bidders are required to submit supporting document for the past experience i.e. copy of the purchase order and work completion report etc. duly notarised along with contact details of the end user. These documents would be subject to further verification by the client, if required. Submission of any false information or violation of the Bid Security Declaration would lead to suspension of the bidder for a period of 3 years.**

d. Copy of GST and PAN/ Registration certificate etc., as applicable shall be uploaded.

e. Copy of a certificate by the auditor/ CA/ CS indicating the turnover of the firm shall be uploaded. The bidder should have total average turnover of minimum **INR 45 Million** in last **3 (three) financial years** ending **31st March 2022**.

f. Copy of all documents related with Firm Registration/ Partnership Deed/ Articles of Memorandum of Association or Proprietorship Deed, Certificate of Incorporation shall be uploaded.

g. Bid Form as per format given at ***Annexure II*** must be uploaded by the bidder along with Technical Bid.

h. Technical Compliance Document in the form of **Tech_Comp_Doc.pdf with** detailed technical specification, make, model and cross reference compliance with the data sheets or OEM compliance should be uploaded in the technical bid, failing which will lead to the rejection of the bid.

i. Declaration as per the format given at **Annexure III** must be uploaded by the bidder along with Technical Bid for undertaking that the IT infrastructure that shall be supplied for Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan will not be refurbished / duplicate or acquired illegally in India / Third Country.

j. The installation and warranty services are required in Tashkent, Uzbekistan. The bidder should upload the signed and scanned copy of the detail plan for providing warranty services at sites. The bidders should have its own Branch Office/ Service Centre in Tashkent, Uzbekistan or arrangement to provide service through local dealer/ service provider. In either case, a signed and scanned undertaking to this effect should be uploaded along with the technical bid as per format given at ***Annexure IV***. The details viz. name, address, contact person, telephone / fax, email etc. should be provided along with an undertaking from this local dealer/ service provider within 30 (thirty) days of the receipt of Supply Order from Embassy of India, Tashkent.

k. Signed and scanned copy of the Checklist as per format given at ***Annexure VII*** must be uploaded along with Technical Bid.

l. Signed and scanned copy of other related documents, mentioned in the tender document but not listed here

Part 2: "Commercial Bid" shall be uploaded in the form of following documents:

a) Price schedule should be submitted online only in the form of **BOQ_XXXX.xls.**

b) The prices should be mentioned in figures as well as in words wherever mentioned in the **BOQ_XXXX.xls**. The bidder should carefully cross check the prices entered in figures with corresponding figures converted in words.

4. Pre-Bid Meeting

The pre-bid meeting shall be held as per schedule mentioned in critical date sheet at:

Embassy of India, 16, Kara-Bulak Street, Mirzo Ulugbek District
Tashkent, Uzbekistan – 100052
Telephone : 998-781400983/997/998

Maximum 2 (Two) participants per bidder will be allowed to participate in the Pre-bid Meeting.

Note: The queries/ suggestions should be submitted only on CPP Portal by the last date/ time mentioned in the Critical Data Sheet. The answer to the queries will be provided only on CPP

Portal after the Pre Bid Meeting. The queries received after due date/ time or through e-Mail/ letter will not be considered.

5. Submission of bids and opening of the Technical bids:

Last date for submission of bids will be as per schedule mentioned in critical date sheet above**.**

Online Technical bids will be opened as per schedule mentioned in critical date sheet above at:

Embassy of India,
Tashkent, Uzbekistan

The bids should be submitted online only at CPP Portal. The bidders' authorized representative (maximum two) may choose to attend the bid opening/s, if desired so. Bids will be opened online as per date/time as mentioned in the Tender Critical Date Sheet.

The technical bids will be evaluated to shortlist the eligible bidders. The technical bids of only the short listed bidders shall be considered for further processing i.e. technical evaluation.

Bidders whose technical bid is found to be acceptable and meeting the eligibility requirements as specified in this tender will be informed about the date and time of the opening of the commercial bid.

6. Opening of Commercial Bids

The online commercial bids of the bidders who are short listed after Technical Evaluation only will be opened in the presence of the bidders or their authorized representative (maximum two), who choose to attend, at the **time place and date** to be informed later.

The authorized representative of bidders, present at the time of opening of the bids shall be required to sign an attendance sheet as a proof of having attended the online commercial bid opening.

The bidder's name, bid prices, discounts and such other details considered as appropriate by Embassy of India, Tashkent, will be announced at the time of the opening of the bids.

Note: Technically accepted online competitive bids ONLY will be considered for the opening of online Commercial Bids.

END OF SECTION II

SECTION III: INSTRUCTIONS TO BIDDERS (ITB)

1. Scope of Work / Project Timelines

The bidder is required to supply, install, commission and provide on-site support of IT Hardware & Software for setting up of Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan. The delivery and installation at site must be completed within 90 days from the date of placement of supply order by Embassy of India, Tashkent. The shipment from India/ third country is required to be done by sea/ air/ road. The delivery at site must be completed within 90 days including the custom clearance & local transportation to the site by the bidder. It is mandatory for the bidders who respond to this bid to meet these expectations as time is the essence of this contract and is tightly linked to Embassy of India, Tashkent plans of completing the project within the available time frame.

2. Locations for the Supply, Installation & Warranty Services

The items as detailed in this document are required to be supplied and installed at Tashkent in Uzbekistan at Armed Forces Academy. The detail of consignee & firm address of the site(s) for supply, installation & commissioning and on-site warranty support will be communicated in the Supply Order.

3. Special Condition

3.1 Tender items has to be procured in India & sent to said site (Tashkent, Uzbekistan) with inter-National on site warranty for 1 (one) year.

3.2 Tender items has to be installed, commissioned & tested at said site (Tashkent, Uzbekistan) & Submit "successful installation & working" report.

3.3 Vendor has to establish the local area Network with CAT-6 Cable, 24 port patch panel with I/O, I/O fish plates & labor for lying cables with materials. Please specify cost for this work & Specify extra cost if any.

3.4 For onsite 01 year warranty, vendor need to tie up facility with local market who can take care until the end of period specified for all items.

4. Order Placements and Release of Payment

The supply order and payment shall be released by:

Head of Chancery
Embassy of India, 16, Kara-Bulak Street, Mirzo Ulugbek District
Tashkent, Uzbekistan – 100052
Telephone : 998-781400983/997/998

5. Email: hoc.tashkent@mea.gov.in ; Website: https:// eoi.gov.in/tashkent

6. Eligible Bidders

6.1 Bidder must be a **registered company/firm** in India in the business of IT hardware, software, and audio-visual equipment and computer peripherals in India / abroad and registered with the government under appropriate act of law. The bidder should be in the similar business for at least last 5 (five) years prior to the date of issue of this tender.

6.2 The bidder should have completed at least **ONE** similar work not less than **INR 7.5 Crore** OR **TWO** similar works not less than **INR 5 Crore** each OR **THREE** similar works not less than **INR 3.5 Crore** each **in last five years ending March 31st 2022.** The similar work means supply, installation, integration and on-site support of all/ most of the items mentioned in this tender document in a single project on turnkey basis in India/ abroad.

The bidders are required to submit supporting document for the past experience i.e. copy of the purchase order and work completion report etc. duly notarised along with contact details of the end user. These documents would be subject to further verification by the client, if required.

6.3 The bidder should have Average annual turnover of minimum **INR 7.5 Crore** in last 3 (three) financial years ending **March 31st 2022**.

6.4 The bidder should be an authorized distributors/ resellers for the items viz. Server, Desktop, Laptop, Printer, Scanner, Projector, Interactive White Board, Video Conferencing, UPS and Networking Items mentioned in the Scope of Supply of the tender document in India/ abroad.

6.5 The bidders should have its **own branch office/ service centre in Uzbekistan** or arrangement to provide onsite support through local dealer/ service provider.

6.6 Bidder should be registered with Sales Tax/ Income Tax Department of Government of India and should possess a valid **GST/ PAN** Number/ Registration etc.

6.7 Bidders should not be under a declaration of ineligibility for **corrupt and fraudulent** practices.

Note: Embassy of India, Tashkent reserves the right to award/ reject the orders to any particular bidder without assigning any reason thereof.

7. Amendment of Tender Document

7.1 At any time prior to the deadline for submission of bids, Embassy of India, Tashkent may, for any reason, whether on its own initiative or in response to the clarification request by a prospective bidder, modify the bid document.

7.2 All prospective bidders who have purchased the bidding document will be notified of the amendment in writing, and such amendments/ modifications will be binding on them.

7.3 Embassy of India, Tashkent at its discretion may extend the deadline for the submission of bids if the bid document undergoes changes during the bidding period, in order to give prospective bidders time to take into the consideration the amendments while preparing their bids.

7.4 Bidders should keep viewing the above-mentioned websites for any corrigendum/ change. There wouldn't be any newspaper advertisement towards the same. If any bidder misses the information published on the website and their bid is rejected, no complaint would be entertained.

A. PREPARATION OF BIDS

Bids shall be submitted online only at CPP Portal: http://eprocure.gov.in/eprocure/app

Bidders are advised to follow the instructions provided in Section-I above for the e-submission of the bids online through the Central Public Procurement Portal for e-Procurement at http://eprocure.gov.in/eprocure/app

Bid documents may be scanned with **100 dpi** with black and white option, which helps in reducing size of the scanned document.

Bidder who has downloaded the tender from the Embassy of India, Tashkent website and Central Public Procurement Portal (CPPP), shall not tamper/modify the tender form including downloaded commercial bid template in any manner. In case if the same is found to be tampered/ modified in any manner, bid will be summarily rejected and the bidder would be liable for **suitable penal** action including suspension for a period of three years.

Bidder should avoid, as far as possible, corrections, overwriting, erasures or postscripts in the bid documents. In case however any corrections, alterations, changes, erasures, amendments and/or additions have to be made in the bids, they should be supported by dated signatures of the same authorized person signing the bid documents.

8. Bid Security Declaration

8.1 The bidder shall furnish a **Bid Security Declaration** to the effect that if the bid is withdrawn or modified during period of validity or if after being awarded the contract the bidder fails to sign the contract, or to submit a performance security before deadline specified in the request for bid document, the bidder will be suspended for a period of three years.

9. Period of validity of bids

9.1. Bids shall be valid for minimum **180 days** from the date of submission. Bid valid for a shorter period shall stand rejected.

9.2. Embassy of India, Tashkent may ask for the bidder's consent to extend the period of validity. Such request and the response shall be made in writing only. The bidder is free not to accept such request without forfeiting the **Bid Security Declaration**. A bidder agreeing to the request for extension will not be permitted to modify his bid.

B. SUBMISSION OF BIDS

The online bid shall be neat, plain and intelligible. Each page of the bid should be signed by the authorized person. They should not contain any terms and conditions, printed or otherwise, which are not applicable to the Bid. The conditional bid will be summarily rejected. Insertions, postscripts, additions and alterations shall not be recognized, unless confirmed by bidder's signature.

10. Deadline for Submission of Bids

10.1 Bids must be submitted online before the due date and time as specified in the critical date sheet.

10.2 Embassy of India, Tashkent may extend this deadline for submission of bids by amending the bid documents and the same shall be suitably notified on the websites only.

11. Late Bids

The online bid submission would not be possible after the deadline for submission of bids.

C. BID OPENING AND EVALUATION OF BIDS

12. Opening of Bids

12.1 The technical bids will be evaluated to shortlist the eligible bidders. The technical bids of only the eligible bidders shall be considered for further processing (technical evaluation).

12.2 Bidder whose technical bid is found to be acceptable and meeting the eligibility requirements as specified in this tender will be informed about the date and time of the opening of the commercial bid.

12.3 Embassy of India, Tashkent will open commercial bids of only the technically short listed bids at the time and date to be informed later.

D. AWARD OF CONTRACT

13. Evaluation of Proposals & Award Criteria

13.1 The bidder must quote for all the items mentioned under Section V – Schedule of Requirement. The lowest price criteria shall be applied on the total composite amount (inclusive of all) of all items taken together.

13.2 Preliminary scrutiny of the proposal will be made to determine whether they are complete, required processing fee (Tender Fee) and **Bid Security Declaration** have been furnished, whether the uploaded documents have been properly signed and whether the bids are generally in order. Proposals not conforming to such preliminary requirements will be prima facie rejected.

13.3 Bids complying with all the eligibility requirements mentioned under Section III Clause 4 of this tender document and fulfilling the specifications and schedule of requirements mentioned in Tech_Comp_Doc.pdf and Section V shall be treated as substantially responsive bids. Responsiveness of the bids shall be determined on the basis of the contents of the bid itself and shall not be determined by extrinsic evidences.

13.4 Embassy of India, Tashkent, if required, may ask bidders for presentation on the solution offered. Failure on part of bidder to arrange the presentation on the date & place fixed shall result in the rejection of technical bids and financial bids of these bidders shall not be opened. Also, if it is found after presentation that the solution offered is not meeting the specifications prescribed by, such bidders shall be treated as substantially non-responsive. Embassy of India, Tashkent's decision shall be final in this regard. The place for presentation shall be conveyed to the bidders at an appropriate date.

13.5 Commercial bids of only those bidders will be opened who are found to be substantially responsive and the work shall be awarded to the commercially lowest bidder.

13.6 Bidder should quote their rates by uploading in prescribed Performa in BOQ_XXXX.xls only. Commercial bids/ prices/ rates other than the format provided or elsewhere in the Bid Document shall be rejected by Embassy of India, Tashkent.

13.7 The rates quoted in figures would be automatically converted in words in BOQ_XXXX.xls. The bidder should carefully cross check the prices entered in figures with corresponding figures converted in words. In case of discrepancy between words and figures, the rates quoted in words shall be treated as final. The correct amount will be calculated by multiplying unit price with quantity and in case of any discrepancy, the corrected amount shall be considered and total of all corrected amount shall be bidder's total quoted amount.

13.8 In the copies of supply order/ contract/ agreement/ experience certificate submitted by the bidder, if the currency is other than Indian Rupees, the value of work in Indian Rupees shall be determined by using the exchange rate declared by Reserve Bank of India as on the last date of submission of technical/ commercial bids and the eligibility of the bidder shall be determined accordingly.

13.9 If more than one bidder happens to quote the same lowest price, Embassy of India, Tashkent, reserves the right to split the order and award the contract to more than one bidder. The splitting in such case will be done on the basis of item wise lowest price quoted by the bidders.

14. Purchaser's Right to amend Scope of Work

14.1 If, for any unforeseen reasons, Embassy of India, Tashkent, is required to change the Scope of Supply, this change shall be acceptable to the bidder without change in the unit price quoted.

14.2 Embassy of India, Tashkent, reserves the right to reject one/ all the bids or cancel the tender without assigning any reasons there for.

14.3 Embassy of India, Tashkent, reserves the right to accord relaxation uniformly to all the bidders in case the bid submitted by all the bidders is found to have minor deviation.

15. Corrupt or Fraudulent Practices

15.1 It is expected that the bidders who wish to bid for this project have highest standards of ethics.

15.2 Embassy of India, Tashkent, will reject bid if it determines that the bidder recommended for award has engaged in corrupt or fraudulent practices while competing for this contract;

15.3 Embassy of India, Tashkent, may declare a vendor ineligible, either indefinitely or for a stated duration, to be awarded a contract if it at any time determines that the vendor has engaged in corrupt and fraudulent practices during the execution of contract.

16. Interpretation of the clauses in the Tender Document / Contract Document

16.1 In case of any ambiguity/ dispute in the interpretation of any of the clauses in this Tender Document; Embassy of India, Tashkent interpretation of the clauses shall be final and binding on all parties.

END OF SECTION III

SECTION IV: SPECIAL CONDITIONS OF CONTRACT (SCC)

1. Prices

1.1. The price quoted shall be considered firm and no price escalation will be permitted.

1.2. Bidders must quote the prices in INR only and as per the prescribed Performa in **BOQ_XXXX.xls** only.

1.3. The prices quoted should be inclusive of freight, insurance, packing and applicable taxes till destination. The packing shall be transport worthy so as to prevent their damage or deterioration to goods during transit to their final destination as indicated in this document. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, and the remoteness of the Goods final destination and the absence of heavy handling facilities at all point in transit. However risk in good shall continue with supplier till goods are delivered in good condition and installed at end user's site duly certified by Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan, end-user & Indian Mission in Uzbekistan.

2. Taxes and Duties:

2.1. The basic price & all applicable taxes and/ or duties except customs duty should be included in the price quoted. The items being imported in Uzbekistan from India will be exempted from payment of Custom Duty. The Government of Uzbekistan/ end user on the request of supplier shall provide necessary Custom Duty Exemption Certificate but the custom clearance will be the responsibility of the successful bidder. No Concession Tax Form (C/D) will be given by Embassy of India, Tashkent.

2.2. Bidder shall arrange to clear the consignment after following customs formalities at Uzbekistan and shall arrange to deliver the consignment to the end user site. The cost and risk of the consignment rests with the bidder till it is delivered to the end user & accepted.

3. Software Licenses:

The software mentioned in Schedule of Requirement is for Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan. The licenses shall contain paper licenses and at least one set of media (DVD's/CDs).

4. Chartered Engineer Certificate:

The successful bidder will be required to furnish the certificate from a Registered Chartered Engineer certifying that the items supplied and their specifications are in compliance with the requirements of the supply order issued by Embassy of India, Tashkent.

5. Completeness Responsibility:

Notwithstanding the scope of work, engineering, supply and services stated in bid document, any equipment or material, engineering or technical services which might not be even specifically mentioned under the scope of supply of the vendor and which are not expressly excluded there from but which are necessary for the performance of Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan in accordance with the specifications

and executing the contract to establish achievement of performance guarantee parameters, are to be provided for and rendered by the vendor without any extra charge so that the said project is completed in all respect.

6. Warranty and Support:

All the items covered in the schedule of requirements, shall carry **minimum 1 (one) year on site comprehensive warranty** from the date of its installation & commissioning. The bidder must undertake to provide the on-site support during the warranty in Uzbekistan. The repairing/ rectification/ replacement/ configuration required, if any, must be done at site only. During the warranty, all complaints should be attended within 24 (twenty four) hours and rectified within 3 (three) working days from the time of complaint. In case the rectification of fault involves replacement of hardware the same should be carried out within 14 (fourteen) working days from the date of intimation.

The bidder should submit along with the technical bid, the contact details of branch office/service centre/local dealer/service provider in Uzbekistan for providing on site warranty services. Failure to do so would result in the levy of penalties. The PBG will be released by Embassy of India, Tashkent only after the submission of satisfactory performance certificate issued by end-user & verified by Indian Mission in Uzbekistan after the completion of warranty period.

7. Payments:

- ***1st Payment Milestone****:-* Embassy of India, Tashkent shall release 60% of the payment to the supplier on dispatch of all items from India on due verification of documents pertaining to proof of dispatch and receipt of Performance Bank Guarantee (PBG).
- ***2nd Payment Milestone*** :- Embassy of India, Tashkent shall release 20% of the payment after delivery of all items at site on verification by Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan / end-user and Indian Mission in Uzbekistan.
- ***3rd Payment Milestone****:-* Embassy of India, Tashkent shall release balance 20% of the payment after successful installation & commissioning of all the items at site on physical verification of equipment/ material at site by a Project Monitoring Committee (PMC) duly constituted by MEA (represented by IFD), end-user & Indian Mission in Uzbekistan.

8. Performance Bank Guarantee (PBG):

The successful bidder within 30 days must submit a PBG equivalent to **03%** of the order value on receipt of supply order from Embassy of India, Tashkent as per the format provided in ***Annexure VI*** of this tender document. **This Bank Guarantee should remain valid for 60 days beyond the date of completion of the Defect Liability Period / Warranty Period of 01 year**.

9. Transport/ Shipping Documents:

After the consignment is ready for dispatch, the successful bidder shall be required to furnish the following documents:

i. Chartered Engineer's Certificate
ii. Bill of Lading/ Air Way Bill (booking details)
iii. Packing List
iv. Insurance Policy (in the name of Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan for 110% value of the Invoice)
v. Invoice & other relevant document(s)

vi. Declaration Letter from OEM as per Annexure III of the tender document

Actual shipment should be done only after receipt of concurrence from Embassy of India, Tashkent based upon the above-mentioned documents.

10. Penalty for delayed Services:

Embassy of India, Tashkent reserves the right to levy penalty @ 1% of order value per week of delay beyond the scheduled timeline of completion of installation at site i.e. 90 (ninety) days from order placement, subject to maximum penalty of 10% of the order value. Embassy of India, Tashkent reserves the right to cancel the order in case the delay is more than 10 weeks. The penalties, if any shall be recovered from the Performance Bank Guarantee (PBG) submitted by the successful bidder or from the Balance payment reserved with Embassy of India, Tashkent may consider relaxing the penalty and delivery requirements, as specified in this document, if and to the extent that, the delay in performance or other failure to perform its obligations under the contract is the result of circumstances not attributed to the bidder. For any such relaxation, the bidder should sought prior written approval from Embassy of India, Tashkent by submitting proper justification with documentary evidences.

11. Jurisdiction:

The disputes, legal matters, court matters, if any shall be subject to New Delhi jurisdiction only.

12. Force Majeure:

Embassy of India, Tashkent may consider relaxing the penalty and delivery requirements, as specified in this document, if and to the extent that, the delay in performance or other failure to perform its obligations under the contract is the result of a Force Majeure. Force Majeure is defined as an event of effect that cannot reasonably be anticipated such as acts of God (like earthquakes, floods, storms etc.), acts of states, the direct and indirect consequences of wars (declared or undeclared), hostilities, national emergencies, civil commotion and strikes at successful bidder's OEM premises.

13. Arbitration:

All disputes of any kind arising out of supply, commissioning, acceptance, warranty maintenance etc., shall be referred by either party (Embassy of India, Tashkent or the bidder) after issuance of 30 (thirty) days' notice in writing to the other party clearly mentioning the nature of dispute to a single arbitrator acceptable to both the parties. The venue for arbitration shall be specified in the purchase agreement. The jurisdiction of the courts shall be specified in the purchase agreement. The Arbitration and Conciliation Act 1996 and the rules made there under with all/ any modifications or amendments thereof for the time being in force shall apply to the arbitration proceedings.

END OF SECTION IV

SECTION V: SCHEDULE OF REQUIREMENT (BILL OF MATERIAL)

1. **Brief information about the informatization object. T*he following projects will be implemented at the creation stage.* The project shall provide for:-**

(a) Equipping the following facilities on the 4th floor of the 5-storey academic building with video conferencing systems, information technology and interactive equipment:

- Large lecture class – 2 pcs.
- Web design and programming lab-1pc.
- Hardware programming laboratory – 1 pc.
- ICT and cyber security laboratory – 1 pc.
- Laboratory for object-oriented, DBMS and console programming - 1 pc.
- Laboratory for 3D modeling and creating virtual reality applications (AR&VR) - 1pc.
- Multimedia laboratory – 1 pc.
- Server room (VSC server, LAN server) - 1 pc.
- Laboratory-1 pc.

(b) Creating a local area network and connecting all objects to the Internet.

(c) Installation, commissioning, integration and operationalisation of individual systems/ technology/ data/ network/ application as a unified system.

2. The layout of laboratories is shown in figure 1.

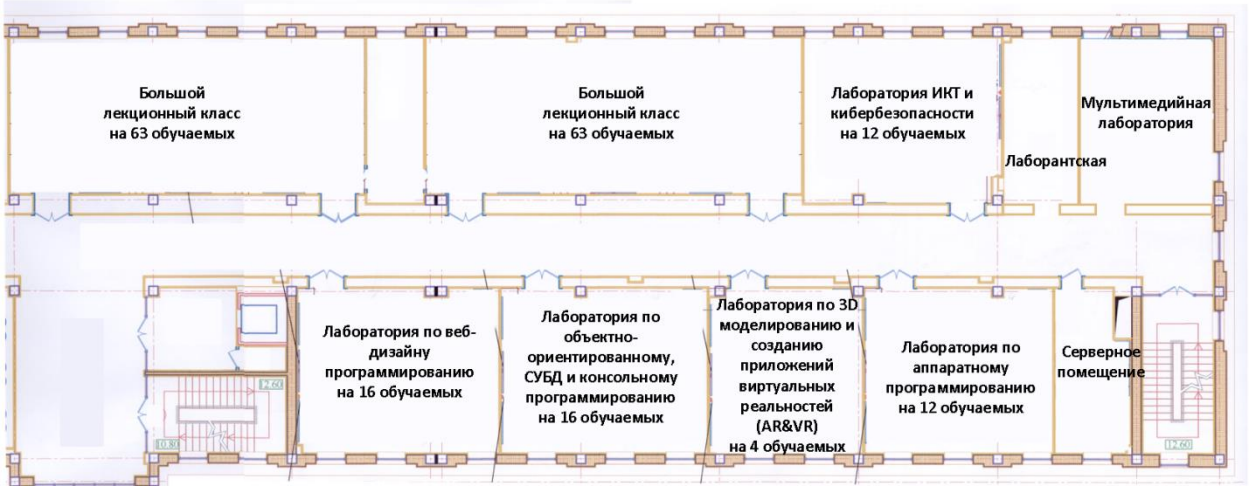

Fig. 1. Layout of laboratories

Large lecture class for 63 students	Large lecture class for 63 students	ICT and cybersecurity lab for 12 students	Laboratory	Multimedia laboratory

Web design and programming lab	Laboratory for object-oriented, DBMS and console programming	Laboratory for 3D modeling and creating virtual reality applications	Hardware programming laboratory	Server room

3. **Large Lecture Classes**. Large lecture classes are located in the academic building of the Academy of the Armed Forces of the Republic of Uzbekistan and represent the rooms with a size of 16 m by 7.2 m and a ceiling height of about 3.2 m.

The diagram of large lecture classes is shown in figure 2.

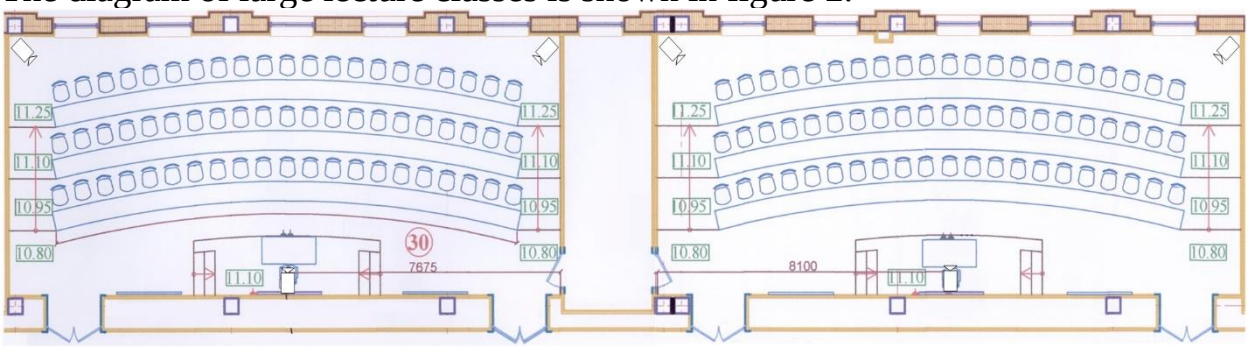

Fig. 2. The diagram of large lecture classes

4. **Programming and ICT laboratories**. The laboratories are located in the academic building of the Academy of the Armed Forces of the Republic of Uzbekistan and represent the rooms with a size of 8.4 m by 7.2 m and a ceiling height of about 3.2 m. Diagrams of laboratories are shown in figure 3.

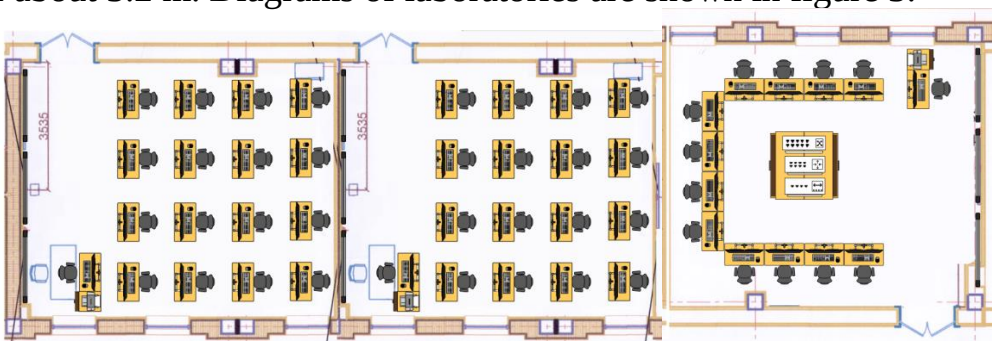

Fig. 3. Diagrams of programming and ICT laboratories.

5. **Laboratory for 3D modeling and creating virtual reality applications**. The laboratory is located in the academic building of the Academy of the Armed Forces of the Republic of Uzbekistan and represents a room with a size of 6.4 m by 7.2 m and a ceiling height of about 3.2 m. The diagram of laboratory is shown in figure 4.

Fig. 4. The diagram for 3D modeling and creating virtual reality applications.

6. **Multimedia laboratory**. The multimedia laboratory is located in the academic building of the Academy of the Armed Forces of the Republic of Uzbekistan and represents a room with a size of 6 m by 7.2 m and with a ceiling height of about 3.2 m. The diagram of the multimedia laboratory is shown in figure 5.

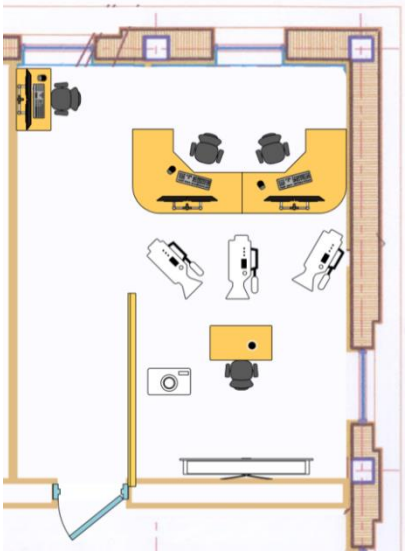

Fig. 5. The diagram of the multimedia laboratory.

7. **Hardware programming laboratory**. The hardware programming laboratory is located in the academic building of the Academy of the Armed Forces of the Republic of Uzbekistan and represents a room with a size of 6.4 m by 7.2 m and a ceiling height of about 3.2 m.
The diagram of the hardware programming laboratory is shown in figure 6.

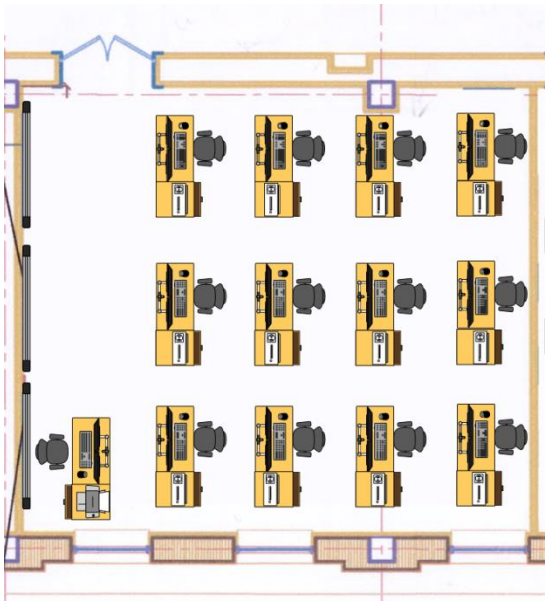

Fig. 6. The diagram of the hardware programming laboratory.

8. **Laboratory and server room**. The laboratory and server rooms are located in the academic building of the Academy of the Armed Forces of the Republic of Uzbekistan and represent a room with a size of 4 m by 7.2 m and with a ceiling height of about 3.2 m.

The diagram of the laboratory and server room is shown in figure 7.

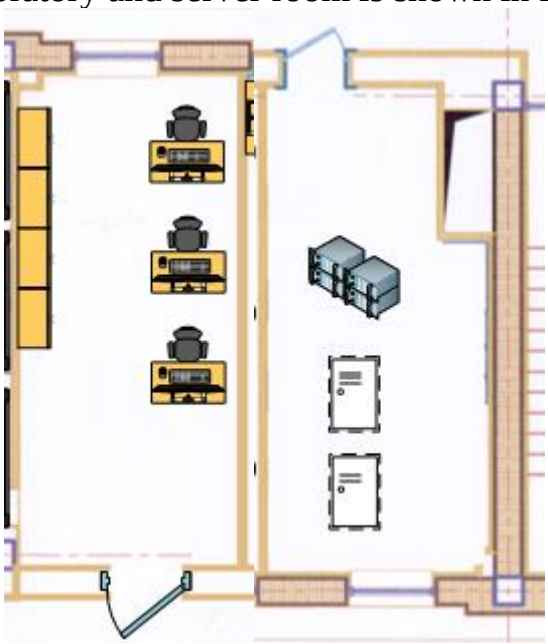

Fig. 7. The diagram of the laboratory and server room.

9. **General scheme for connecting equipment to LAN**.

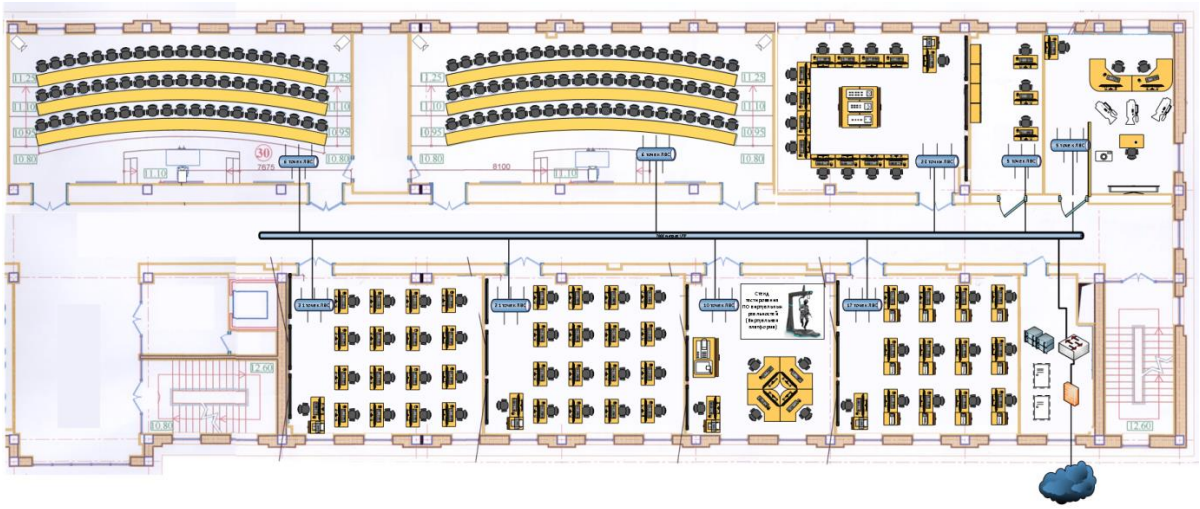

Fig. 8. General scheme for connecting equipment to LAN.

10. **Requirements to the system**.

11. **General requirements to the system**. The ICT CLC created by the Academy of the Armed Forces of the Republic of Uzbekistan within the framework of this project should, with guaranteed quality, provide for :-

- required functionality achieved through careful design of hardware and software systems;
- use of unified and standardized solutions;
  The main indicators of functional efficiency of systems are:
- reliability – the ability of the system to perform the required functions without compromising quality;
- performance – the ability of the system to perform data processing, storage, presentation, and replication tasks with the required speed;
- manageability – the ability of the system to adequately respond to the control actions applied by the administrator or the management system;
- operational manufacturability – the ability to provide ease of maintenance and ease of administration.

12. **Project implementation should be based on the following key principles**:

- compliance with national and international standards in the design and development of the ICT CLC solution architecture of the Academy of the Armed Forces of the Republic of Uzbekistan;
- unification of the technologies used, assuming a unified architecture, unified information exchange protocols, unified data aggregation and transmission procedures, common hardware and software, etc.;
- providing sufficient transport and network resources

- taking into account the increased workload and providing the necessary capacity reserve;
- use of modern technical solutions, selected based on the best world experience in building information technology systems;
- unification and standardization, involving the use of standard technical solutions (structural blocks) at all levels;
- possibility of adaptive (depending on current needs) modernization throughout the entire life cycle, ensuring full compatibility with the applied (business) technologies that appear in the course of information technology modernization.
- ensuring openness, modularity and scalability of technical solutions based on the concept of providing infrastructure services;
- step-by-step build-up of the functionality of the architecture components.

13. Along with the above, when developing solutions for creating the ICT CLC of the Academy of the Armed Forces of the Republic of Uzbekistan, it is necessary to take into account the implementation of the following requirements:

- ensure that the system being created meets the technical requirements of national and international legal acts of the Republic of Uzbekistan and regulatory and technical documents in the field of information and telecommunication technologies in the Republic of Uzbekistan;
- offer technical solutions that ensure fault-tolerant operation by reserving hardware components that are critical to failures and using application and data protection software;
- offer cost-based solutions, provide an acceptable cost, and ensure the safety of financial resources and the possibility of "seamless" integration into the existing information and telecommunications infrastructure;
- ensure minimum design and commissioning terms.

14. **Requirements for the structure and operation of the system**. The deployment of the ICT CLC of the Academy of the Armed Forces of the Republic of Uzbekistan is planned to be carried out with a connection to Internet resources. Interactive equipment should provide improved delivery of educational material.

15. **Operating conditions and environment**. Operating conditions and environment of the automation facility:

- The supply voltage of the equipment should be stabilized at 220±2% with a frequency of 50 Hz.
- ICT CLC network equipment should be connected to the power grid via an uninterruptible power supply (UPS), and provided with a backup power generator.

- ICT CLC equipment should be operated in the room with air conditioning system to maintain the room temperature of 20°C.

16. **Reliability requirements**. The reliability of the ICT CLC of the Academy of the Armed Forces of the Republic of Uzbekistan should be achieved by the coordinated application of a set of organizational, procedural, and software and technical measures during the operation of the system. The complex should provide users with 24 hours of work a day, 7 days a week, 365 days a year. Service level fault tolerance, unified ways of providing services for all types of inclusions, availability of the network and services 24 hours a day, 7 days a week, reservation of communication channels and main modules in the 1+1 format, processing of large amounts of data should be provided.

17. **Safety requirements**. According to the permissible levels of illumination, vibration and noise loads, the ICT CLCF systems of the Academy of the Armed Forces of the Republic of Uzbekistan are required to ensure safety during installation, commissioning, operation, maintenance and repair of technical equipment. Installation, adjustment, operation and maintenance of technical equipment should meet the requirements of state standards, rules and regulations of equipment operation, as well as sanitary standards and rules of the organization of technological processes, and hygienic requirements for production equipment, regulatory and technical documentation of manufacturers. The personnel allowed to work on the equipment should be provided and acquainted with the instructions for the safe operation of this type of equipment on receipt. Untrained and unauthorized persons are not allowed to use the equipment.

18. **Requirements for ergonomics and technical aesthetics**. AWP of users of the ICT CLC system should be equipped in accordance with SanPiN No. 0224-07 "Sanitary rules and regulations. At the work on personal computers, video display terminals and office equipment".

19. **Transportability requirements for mobile systems**. Design requirements that ensure the transportability of ICT CLC technical means of the Academy of the Armed Forces of the Republic of Uzbekistan, as well as requirements for vehicles, are not imposed. When delivering the purchased items, the supplier assumes responsibility for the integrity and safety of the equipment during transportation.

20. **Requirements for operation and maintenance of components**. ICT CLC developed by the Academy of the Armed Forces of the Republic of Uzbekistan has the following operational requirements:

- Operating temperature of the equipment from -15°C to +50°C;
- Operating humidity from 20% to 80%.

The maintenance requirements:

The functionality of the equipment should be checked once a week.
Storage requirements for components:

- Equipment storage temperature from -20°C to +60°C;
- Storage humidity from 20% to 80% (non-condensing).

All major components of the system should be reserved according to the 1+1 scheme.

21. **Requirements for protecting information from unauthorized access**. The ICT CLC Academy of the Armed Forces of the Republic of Uzbekistan should provide for controlling and managing means that restrict access rights to the ICT CLC systems. Access to the ICT CLC Academy of the Armed Forces of the Republic of Uzbekistan systems should be provided only for registered users who have passed the identification and authentication procedure.

22. **Requirements for protection from environmental effects**. In rooms with placed technical means, the climatic conditions determined by the requirements of the manufacturers of the used technical means should be provided. There are no special requirements for protection from environmental effects.

23. **Requirements for patent and license purity**. The Contractor should use only intellectual property objects, the right to which is acquired (obtained) and used without violating the intellectual property rights of third parties or provided by the customer. This requirement should ensure that developers' copyrights, related rights, patent and other rights are respected. The Contractor undertakes to transfer the right to use the protected results of intellectual activity, the right to which belongs to the Contractor and (or) third parties, and which were used by the Contractor, free of charge.

24. **Requirements for standardization and unification**. Hardware components at all levels should interact with each other using standardized procedures and protocols. When creating a system, the licensed software or programs that are free of licensing should be used. The project should use standard products, ready-made devices and parts.

25. **Requirements for types of support**.

26. **Requirements for mathematical support**. The system being developed does not impose requirements to mathematical support

27. **Requirements for information support**. The information support of the ICT CLCF of the Academy of the Armed Forces of the Republic of Uzbekistan should be sufficient to perform all the automated functions of the system.

28. **Requirements for language support**. The system being developed does not impose requirements to linguistic support.

29. **Technical and software requirements**. To organize distance learning with students, it is proposed to equip all laboratories and lecture classes with VCS terminals. In order to increase productivity and provide extensive visualization when working with multi window software it is proposed to equip all personal computers with two monitors.

30. **Requirements for methods and means of communication**. For the system to function, all devices within a single object must be combined into a local area network using the TCP/IP Transport Protocol.

31. **Requirements for connecting to a data network**. To ensure the required connection speed and meet the reliability requirements for the data transmission network, the ICT CLC of the Academy of the Armed Forces of the Republic of Uzbekistan must be connected to the Internet using an optical link.

32. **Requirements for equipment placement and connection types**. All the equipment of the ICT CLC of the Academy of the Armed Forces of the Republic of Uzbekistan is placed in such a way as to provide comfortable conditions for students and teachers, to organize the training process at a high level, using modern ICT technologies.

The general layout of the equipment is shown on the figure 9.

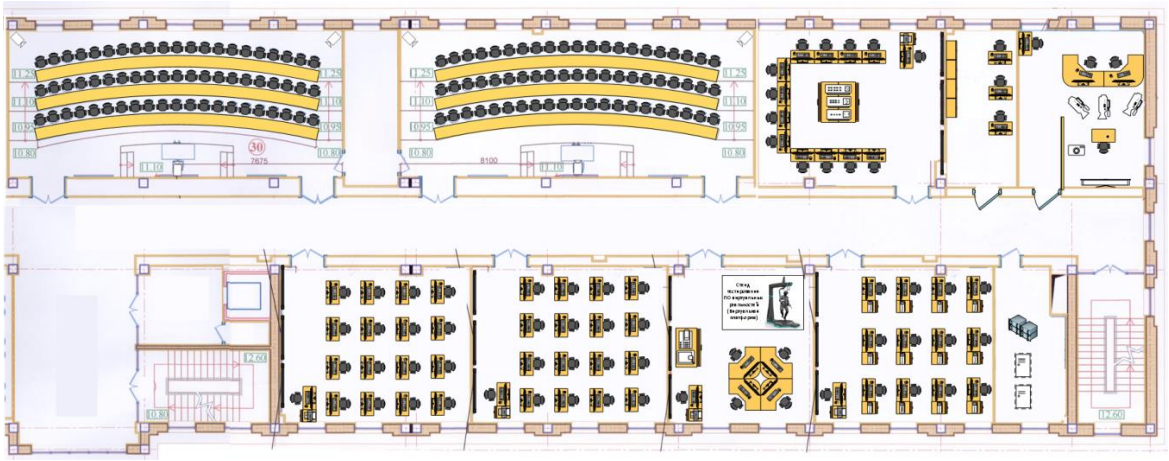

Fig.9 General layout of the equipment

33. **Large lecture classes ICT CLC of the Academy of the Armed Forces of the Republic of Uzbekistan**. Large lecture classes (2 pcs.) ICT CLC of the Academy of the Armed Forces of the Republic of Uzbekistan is Offered to equip with the following equipment (the number is given for two lecture halls):

Name	Quantity
VCS type 1 video communication terminal (with three rotary cameras each)	**2** (two)
A4 color MFP	**2** (two)
Mobile interactive tribune	**2** (two)
Interactive touch screen -65"	**4** (four)
HDMI splitter	**2** (two)
Set of audio and video cables	**2** (two)
HDMI-cable 10 m	**4** (four)
HDMI-cable 20 m	**4** (four)
Lap top	**2** (two)

On the fourth floor of the academic building there are 2 large lecture rooms. In each room it is necessary to provide for the installation 1 set of VCS terminal with three cameras, a mobile interactive stand complete with a speaker system, two interactive 65 " touch screens.

The VCS terminal will be located in an interactive three-seat platform, with cameras installed-2 on the opposite wall from the Department at the corners and 1 camera installed between interactive 65-inch touch screens. A mobile interactive stand will be connected to the speaker system (two 15-Watt speakers). Two interactive 65" touch screens will be installed on the Department and connected to the VCS terminal via an HDMI splitter.

There must be 6 power outlets in the room.

34. **Laboratories for web and object-oriented programming**. Laboratories are supposed to be equipped with the following equipment (the number is given for 2 laboratories):-

Name	Quantity
VCS type 2 video communication terminal (with 1 camera)	**2** (two)
Interactive touch screen – 65"	**4** (four)
A4 color inkjet printer	**2** (two)
Personal computer with two monitors included	**34** (thirty four)
HDMI splitter	**2** (two)
HDMI-cable 10 m	**4** (four)

Each laboratory is supposed to be equipped with a VCS terminal located between interactive 65 " touch screens, personal computers with two monitors and an A4 color inkjet printer.
Two interactive 65 " touch screens will be installed on the wall and connected to the VCS terminal and the teacher's personal computer via an HDMI splitter. In the room, it is necessary to provide floor-mounted network boxes for 17 workplaces, each of which will be equipped with a power outlet for connecting to the network switch and 4 power outlets for connecting a computer and monitors.

35. **Laboratory for creating 3D modeling and creating virtual reality applications**.

The laboratory should be equipped with a VCS terminal, two interactive 65" touch screens, enhanced personal computers with two monitors, virtual reality helmets, an A4 color inkjet printer, a 3dscanner, and a virtual platform for testing developed software.
Two interactive 65" touch screens will be installed on the wall and connected to the VCS terminal and the teacher's personal computer via an HDMI splitter.
In the room, it is necessary to provide floor-mounted network boxes for 6 workplaces, each of which will be equipped with a power outlet for connecting to the network switch and 4 power outlets for connecting a computer and monitors. It is also necessary to provide a connection of the virtual platform to one of the screens and to the network.
Composition of equipment for the laboratory:

Name	Quantity
VCS type 2 video communication terminal (with 1 camera)	**1** (one)
Interactive touch screen – 65"	**2** (two)
A4 color inkjet printer	**1** (one)
Enhanced personal computer with two monitors included	**5** (five)
HDMI splitter	**1** (one)
HDMI-cable 10 m	**2** (two)
3D scanner	**1** (one)
Head-mounted display	**5** (five)
Virtual platform	**1** (one)

36. **Hardware programming laboratory**. The laboratory is expected to be equipped with a VCS terminal, two interactive 65 " touch screens, personal computers with two monitors, and an A4 color inkjet printer. Two interactive 65" touch screens will be installed on the wall and connected to the VCS terminal and the teacher's personal computer via an HDMI splitter. In the room, it is necessary to provide floor-mounted network boxes for 13 workplaces, each of which will be equipped with a power outlet for connecting to the network switch and 4 power outlets for connecting a computer and monitors.

Equipment composition:

Name	Quantity
VCS type 2 video communication terminal (with 1 camera)	**1** (one)
Interactive touch screen – 65»	**2** (two)
A4 color inkjet printer	**1** (one)
Personal computer with two monitors included	**13** (thirteen)
HDMI splitter	**1** (one)
HDMI-cable 10 m	**2** (two)

37. **The laboratory for ICT and cyber security**. The laboratory is expected to be equipped with a VCS terminal, two interactive 65 " touch screens, personal computers with two monitors, network equipment (for laboratory work) and an A4 color inkjet printer.
Two interactive 65" touch screens will be installed on the wall and connected to the VCS terminal and the teacher's personal computer via an HDMI splitter. In the room to provide outdoor network box for 13 workplaces, each equipped with a network socket to connect to the network switch and the 4 power outlets to connect your computer and monitors and floor boxes for network connection active network equipment
Equipment composition:

Name	Quantity
VCS type 2 video communication terminal (with 1 camera)	**1** (one)
Interactive touch screen – 65»	**2** (two)
A4 color inkjet printer	**1** (one)
Personal computer with two monitors included	**13** (thirteen)
HDMI splitter	**1** (one)
HDMI-cable 10 m	**2** (two)
Network firewall	**1** (one)
ATM access switch	**1** (one)
Router	**1** (one)
Core network switch	**1** (one)

38. **Multimedia laboratory**. The laboratory is supposed to be equipped with the following multimedia equipment (the number is given for the laboratory):

Name	Quantity
Video camera	**1** (one)
Memory card	**3** (three)
Camera gun-type microphone	**1** (one)
Battery for the camera	**3** (three)
On-camera lamp for 4K camcorder	**1** (one)
Battery for on-camera lamp	**2** (two)
Charger for on-camera lamp	**1** (one)
Camera bag	**1** (one)
Tripod for 4K camcorder	**1** (one)
Camera stabilizer	**1** (one)
Lighting kit	**1** (one)
Digital camera	**1** (one)
Standard lens for the camera	**1** (one)
Wide angle lens for camera	**1** (one)
Lens body (zoom) for the camera	**1** (one)
Tripod type monopod	**1** (one)
Memory card	**3** (three)
Battery for the camera	**3** (three)
Camera bag	**1** (one)
Photoflash	**1** (one)
MQ-300 Studio light set for photography	**1** (one)
Action camera (with a set of accessories)	**1** (one)
Steadicam manual stabilizing with camera	**1** (one)
Wireless microphone combo system	**2** (two)
Lavalier microphone with cable	**3** (three)
Reporter microphone with cable	**1** (one)
Sound mixing console	**1** (one)
Control speaker	**4** (four)
External array for online data storage	**2** (two)
Portable hard drive	**2** (two)
Interactive touch screen – 65”	**1** (one)
A4 color inkjet printer	**1** (one)
Enhanced personal computer (graph station) with two monitors included	**3** (three)

39. **Server room**. In the server room, it is planned to deploy video conferencing servers and local area network (virtualization), which are intended for organizing communication of the VCS system both within the ICT CLC of the Academy of the Armed Forces of the Republic of Uzbekistan, and with subscribers of leading national and foreign higher education institutions, combining all users into one single network. VCS servers, LAN, access switches for 48 ports, firewall, uninterruptible power supplies and patch panels will be installed in server racks that will be placed in the server room.

The server room is supposed to be equipped with the following equipment:

Name	Quantity
Patch panels for 48 ports	**4** (four)
MCU server	**1** (one)
Virtualization server	**3** (three)
Virtualization software	**1** (one)
Storage system	**1** (one)
Backup system	**1** (one)
Backup System software	**1** (one)
Licenses for the Microsoft Windows Server operating system	**1** (one)
Network firewall	**1** (one)
Data network access switch	**3** (three)
Server rack	**2** (two)
Uninterruptible power supply	**6** (six)

40. **Laboratory room**. It is proposed to equip the laboratory with a VKS terminal with an interactive 65" touch screen and laptops.

Name	Quantity
Laptop	**6** (six)
Interactive touch screen – 65”	**1** (one)
VCS type 2 video communication terminal (with 1 camera)	**1** (one)

41. **Requirements for the composition and content of work on creating the system**

(a) **Testing equipment**. Prior to the start of installation work, all equipment must be checked by the Customer together with the Contractor for completeness, availability of software, and each piece of equipment must pass the "cold start" procedure, i.e. electric power must be supplied and all elements and modules of the equipment, including the software, must be checked for operability.

(b) **Installation of the equipment**.

- Telecommunications cabinets must be connected to the ground loop.
- It is recommended that all active network equipment be powered by connecting it to uninterruptible or independent power supplies.

(c) **The requirements for the degree of adaptability of the system to the changes**. It is necessary to provide for changes to the automation object:

- Changing the number of system users;
- Changing the physical location of workspaces within workgroups;
- Change the composition and number of user workgroups.

To provide flexible management of workplace movements within any single object, provide ways to reconfigure the system:

- At the level of physical switching of switching cables;
- At the level of changing the configuration of active network devices

The operation of the system should not depend on the type of computing devices used (computing platform), and allow the possibility of changing them to another type of equipment.

42. **Ensuring the level of reliability**.

(a) **Ensuring the security and protection of information**. To address security issues and protect information in the complex, provide features implemented at the hardware and software level: The package should include administrative measures to detect unauthorized changes in the system. It is necessary to provide rules for reflecting all cases of changes to the system configuration.

(b) **Ensuring the security of the management system**. The data transmission equipment management system should provide a flexible strategy for distributing user rights (user authentication according to the object

and operation), based on the rules of administrative responsibility. The data transfer equipment management system should provide simple and convenient tools for copying data, which makes it easier for the administrator. The data transfer equipment management system must provide detailed logs for users and operational tasks.

43. **Requirements for the use of modern technologies in design solutions**. When designing the complex, the most modern technological achievements in the field of network technologies should be used. The project should use equipment produced by leading manufacturers of equipment and solutions in the field of creating and building ICT systems.

44. **Requirements to the operating conditions and the characteristics of the environment**. The operating conditions of the complex and the environmental characteristics of the working premises for personnel must meet the requirements of sanitary norms and rules established in the Republic of Uzbekistan.

45. **Requirements for equipment replacement**. During the warranty period, replacement of faulty equipment must be free of charge.

46. **Procedure of control and acceptance of system**. The procedure for monitoring and acceptance of the system will be determined by the schedule and the test methods of the system (Acceptance Test Procedure) to be submitted by the supplier prior to delivery. The acceptance test procedure submitted should be comprehensive and include qualitative requirements and technical requirements specified in this schedule of requirement, working and functionality demonstration of each equipment, network, data, and software application as a standalone system and also as a part of the Integrated System. This will be further approved by the customer prior to delivery. Delivery-acceptance will be made in accordance with the approved Acceptance Test Procedure, methodology and the schedule approved by the Customer. Delivery-acceptance of works is carried out by the Commission, the composition and rules of work of which is determined by the Customer. The System is accepted by a Commission appointed by the Customer. The status and composition of the Commission is determined by the Customer.

47. Acceptance procedure will include demonstration of satisfactory functioning of each equipment/ network/ data/ software application integrated in a system as a whole.

TABLE OF TECHNICAL REQUIREMENTS FOR EQUIPMENT FOR INFORMATION TECHNOLOGY LABORATORY AT THE ACADEMY OF THE ARMED FORCES OF THE REPUBLIC OF UZBEKISTAN.

№	Particulars	Configuration	Units needed
1.	**Videoconferencing terminal VKS type 1 (with 3 rotary cameras each),** based on: 2K-TA. in large lecture classes.	**Composition of the VCS video communication terminal set:** - Codec - Camera rotatable 3 pcs. - Set of 2 wireless microphones - Devices for wireless content transfer - License for subscribers. **Requirements for technical and functional characteristics of the video conferencing terminal (codec):** - implementation of compression/decompression procedures for audio and video streams at the hardware level; - organization of communication by means of an IP network using H. 323 and SIP protocols; - availability of a radio remote control; - availability is at least one network interface of the 10/100/1000 Base-T type; - support for working with a video stream in quality not worse than Full HD 1080 60p; - support for 1080 30p content transfer; - ability to wirelessly receive content from the lecturer; - the ability to connect at least nine cameras with support for control from the terminal, the standard remote control; - ability to connect two microphones; - ability to connect wireless microphones; - support for H. 264 High profile, H. 263, H. 265 HVEC video encoding algorithms; - support for opus, AEC, G. 722, and G. 711 audio encoding algorithms; - availability of the integrated video outputs: - availability of the integrated video inputs: - at least one HDMI; - Line audio input type RCA; - Availability of RCA line audio output; - At least 3 USB ports; - Transfer audio to the display device via HDMI; - support for the Russian-language interface for managing the video conferencing terminal; - Support for remote hardware software updates. - Support for packet loss prevention technology (anti-packet loss technology) - Ability to record a conference on a USB stick -Support for at least 8 cameras with one codec **Requirements for technical and functional characteristics of a video camera complete with a video communication terminal (codec):** - hardware support for working with video with a quality is at	**2** (two)

№	Particulars	Configuration	Units needed
		least Full HD 1920 x 1080 60p, at least 2 MP; - frame rate is at least 50 fps; - availability of automatic exposure control; - availability of auto focus; - presence of noise reduction mode; - support for video conferencing terminal management; - at least 12x optical zoom; - horizontal viewing angle is at least 70°; - vertical viewing angle is at least 42°; - video output-HDMI; - availability of an RJ-45 output for connecting to the codec and transmitting the video stream over Ethernet; - presence of the RJ-45 camera control interface; - availability of an RS-232/Equivalent camera control interface; **Requirements for technical and functional characteristics of a wireless circular microphone:** The package must include at least 2 circular pattern microphones, an adapter for connecting to the codec, and a charging station for them; - sound capture radius is at least 3 Metres - on button./ microphone off; - Support for the DECT standard (1880-1900Hz) -- Battery capacity is at least 800mAh **Requirements for technical and functional characteristics of a wireless content transmission device complete with a video communication terminal (codec):** - Source and receiver of the signal in the composition; - Video transmission in a resolution is at least 1080p; - Delay no more than 120ms; - USB interface; Warranty for the set is at least 12 months.	
2.	**Videoconferencing terminal VKS type 2,** based on: 5 pcs. in the laboratory, 1 PC. in the laboratory room	**Requirements for technical and functional characteristics of the videoconferencing terminal:** - implementation of compression/decompression procedures for audio and video streams at the hardware level; - organization of communication by means of an IP network using H. 323 and SIP protocols; - availability of a radio remote control; - availability is at least one network interface of the 10/100/1000 Base-T type; - support for working with a video stream in quality not worse than Full HD 1080 60p; - support for 1080 30p content transfer; - ability to wirelessly receive content from the lecturer; - the ability to connect at least nine cameras with support for control from the terminal, the standard remote control; - ability to connect two microphones; - ability to connect wireless microphones; - support for H. 264 High profile, H. 263, H. 265 HVEC video encoding algorithms; - support for content transfer protocols - support for opus, AEC, G. 722, and G. 711 audio encoding	**6** (six)

№	Particulars	Configuration	Units needed
		algorithms; - availability of the integrated video outputs: - availability of the integrated video inputs: - at least one HDMI; - Presence of a 3.5 mm linear audio input; - 3.5 mm linear audio output; - At least 3 USB ports; - Transfer audio to the display device via HDMI; - support for the Russian-language interface for managing the video conferencing terminal; - Support for remote hardware software updates. - Support for creating two independent conferences at the same time - Support for packet loss prevention technology (anti-packet loss technology) - Availability of a built-in camera - Support for at least 8 cameras with one codec - Ability to record a conference on a USB drive **Requirements for technical and functional characteristics of the built-in video camera of the video communication terminal (codec):** - hardware support for working with video with a quality is at least Full HD 1920 x 1080 60p, at least 2 MP; - frame rate is at least 50 fps; - availability of automatic exposure control; - availability of auto focus; - presence of noise reduction mode; - support for video conferencing terminal management; - at least 12x optical zoom; - horizontal viewing angle is at least 70°; - vertical viewing angle is at least 42°; - video output-HDMI; - availability of an RJ-45 output for connecting to the codec and transmitting the video stream over Ethernet; - presence of the RJ-45 camera control interface; - availability of an RS-232/ Equivalent camera control interface; **Requirements for technical and functional characteristics of a wireless circular microphone:** The package must include at least 2 circular pattern microphones, an adapter for connecting to the codec, and a charging station for them; - sound capture radius is at least 3 Metres - on button./ microphone off; - Support for the DECT standard (1880-1900hz) - Battery capacity is at least 800mAh - Warranty is at least 1 year. **Requirements for technical and functional characteristics of a wireless content transmission device complete with a video communication terminal (codec):** - Source and receiver of the signal in the composition; - Video transmission in a resolution is at least 1080p; - Delay no more than 120ms;	

№	Particulars	Configuration	Units needed
		- USB interface; Warranty for the set is at least 12 months.	
3.	**Interactive touch screen-65",** based on: 4 pieces in large lecture classes, 11 pcs. in the laboratory, 1 pc. in the laboratory room	**Requirements for technical and functional characteristics** - Image format-16:9; - Display diagonal-65" (165 cm); - Screen resolution- at least 1920*1080; - Contrast Ratio - 4000 : 1; - Number of touches – 10 simultaneous (finger, pen, or any other opaque objects); - Number of users-10; - Input connectors-Digital TV Tuner, HDMI*2 Input, VGA Input, audio Input, 3.5 mini Jack, USB 3.0*2; - Output connectors-VGA Output, audio Output, 3.5 mini Jack; - Audio output - 2 x 10 Watt; - Audio output - 2 x 10 Watt; - Processor- Intel Core i3 4130 or higher; - RAM – 4 GB DDR3 1600; - Installed HDD capacity-HDD 500GB SATAIII 5400 rpm; - Network - 10/100 Mbit/s Realtek; - A set of fasteners for installation on drywall surfaces; - Warranty is at least 12 months.	**16** (sixteen)
4.	**Mobile interactive tribune** based on: 2 pcs. in large lecture classes	**Requirements for technical and functional characteristics of the interactive stand:** - Metal case material - Interactive screen 22"; - Gooseneck microphone + wireless microphone (manual and lapel); - Integrated multimedia player(with amplifier); - PKS-7000C control controller (with amplifier) + 7" LCD touchpad+ laptop input (HDMI) - Input interfaces: VGA, HDMI x2, RJ45, USB x4, Power Socket - 150W x 2 / 8Ω amplifier (300W) - Speaker 60 W (2EA) - Warranty is at least 12 months.	**2** (two)
5.	**Color MFP A4 size** based on: 2 pcs. in large lecture classes	**Requirements for technical and functional characteristics:** ‣ Device type-printer / scanner/copier; Printer: - Printing technology-laser printing; - Print type-color; - Paper size-A4; - Support for automatic two-sided printing; - Max. print speed A4 b / W-one-sided at least 25 pages / min; - Print resolution-600 x 600 dpi, 1200 x 1200 dpi; - Support-UFRII, PCL6; - Print JPEG/TIFF/PDF files from USB media; Scanner: - Type-color - Paper size-A4; - Form factor-tablet, two-way automatic document feeder; - Scanning resolution-optical 600 x 600 dpi; - ADF scanning speed: one-way at least 55 images./min (300dpi) and 30 images./min (600dpi), two-way at least 27 images./min	**2** (two)

№	Particulars	Configuration	Units needed
		(300dpi) and 15 images./min (600dpi); - TWAIN and WIA support; - Support sending files by mail, to PC, to USB storage, to SMB / FTP server-JPEG/TIFF/PDF; Copier: - Paper size-A4; - One-way copy speed: A4 b / W-at least 25 pages / min; - Copy resolution-600 x 600 dpi; General: - Paper feed-manual / automatic, one-way/two-way; - The volume of the feed tray is at least 500 sheets; - The volume of the feed tray is at least 100 sheets in the universal tray; - The volume of the output tray – 250 sheets; - Paper type – thin, plain, secondary, color, pre-perforated, thick, fabric, transparent film, labels, envelopes, tracing paper; - Paper density-standard tray from 55 to 220 g / m2; - Memory capacity-at least 2GB; - Control panel – color LCD touch screen; - Connection interface-USB 2.0, USB3. 0, 10/100 /1000 Ethernet RJ-45; - Power supply 220-240 V, 50/60 Hz; - OS support – Windows 10/8. 1/7, Mac OS X, Linux; - Warranty is at least 12 months	
6.	**A4 color inkjet printer** based on: 6 pcs per lab	**Requirements for technical and functional characteristics:** ‣ Device type – printer Printer: - Printing technology-inkjet printing; - Print type-color; - Paper size-A4; - Support for automatic two-sided printing; - Max. print speed A4 b / W-one-sided at least 14.5 pages / min; color – 10.4 pages / min - Print resolution-Up to 9600 x 2400 dpi Support-UFRII, PCL6; - Print JPEG/TIFF/PDF files from USB media; General: - Paper feed-manual / automatic, one-way/two-way; - The volume of the feed tray is at least 500 sheets; - The volume of the feed tray is at least 100 sheets in the universal tray; - The volume of the output tray – 250 sheets; - Paper type – thin, plain, secondary, color, pre-perforated, thick, fabric, transparent film, labels, envelopes, tracing paper; - Paper density-standard tray from 55 to 220 g / m^2; - Memory capacity-at least 2GB; - Control panel – color LCD touch screen; - Connection interface-USB 2.0, USB3. 0, 10/100 /1000 Ethernet RJ-45; - Power supply 220-240 V, 50/60 Hz; - OS support – Windows 10/8. 1/7, Mac OS X, Linux; - Warranty is at least 12 months	**6** (six)

№	Particulars	Configuration	Units needed
7.	**Personal computer with two monitors completed with**: 34 pcs. in the laboratory for web and object-oriented programming, 26 pcs.in the laboratory for cybersecurity and hardware programming.	**PC features:** - Quantity – 1 PC. - Form factor: Tower - Number of processor cores at least-8; - Processor base clock frequency not less than-not less than 3.1 GHz with the maximum frequency in overclocking mode not less than 4.9 GHz; - Processor cache memory not less than-not less than 16MB; - Compatibility with both 64-bit and 32-bit applications at the hardware level; - The amount of RAM not less than 32GB DDR4 2666; - Ability to expand RAM up to 128GB; - Ability to install memory with ECC support; - At least 4 slots for installing memory modules; - At least 4 SATA interfaces for connecting hard drives and solid-state drives; - Solid-state drive (SSD) not less than 256GB; - Hard disk with at least 2TB SATA 7200RPM; - Hard disk controller with support for RAID levels is at least 0/1; -DVD-RW optical drive; - Video card: discrete, processor frequency not less than 1700MHz, memory capacity not less than 8GB, memory type-GDDR6, memory bus bit not less than 256 bit, at least 3 DisplayPort ports, at least 1 HDMI port, cooling system type-active; - Network interface: at least 1 x RJ-45 Ethernet with 100/1000Mbps; - I/o interfaces: at least 6 USB 3.0 ports, at least 2 USB2.0 ports, at least 1 universal audio port, at least 2 audio outputs/inputs, at least 2 DisplayPort ports; - At least 1 PCIe Gen3 x16 slot, at least 1 PCIe Gen3 x4 slot, at least 2 PCIe G3 x1 slots, at least 2 M. 2 slots for SSD installation (PCIe Gen3 x4); - Power supply with a power is at least 650W and an efficiency is at least 90% with active power factor correction; - Russian Keyboard and mouse with scroll wheel; - Warranty is at least 3 years without returning the drives when the warranty is replaced **Monitor Feature:** - Quantity – not less than 2 units with bracket mount to the table - Panel type-IPS with led backlight; - monitor diagonal is at least 23.8” with an aspect ratio of 16: 9; - anti-glare coating; - native resolution is at least 1920x1080 @ 60 Hz; - number of displayed colors: at least 16.7 million; - brightness is at least 250 cd/m^2; - contrast ratio is at least 1000:1; - response time no more than 5ms; - ports – 1xdisplay Port; 1xVGA, 1xHDMI; - at least 2 USB 3.0 ports; - viewing angles is at least 178 horizontally and vertically; - support for VESA mounting 100mm;	**60** (sixty)

№	Particulars	Configuration	Units needed
		- stand with the ability to adjust the angle of the monitor, adjust the height is at least 100mm, with the ability to rotate in the horizontal and vertical plane; - bracket for installing two displays simultaneously on VESA 100mm mounts from 19 to 27 inches with the ability to adjust the height to 120mm, adjust the tilt angles from -5 to 24 degrees, rotate the monitors in portrait orientation; -Licensed Windows 10 operating system - Warranty is at least 3 years	
8.	**Enhanced personal computer (graph station) with two monitors completed with:** 5 pcs. in the laboratory for 3D modeling and creation of virtual reality software, 3 pcs. in the multimedia laboratory	**PC features:** - Quantity – 1 PC. - Form factor: Tower - Number of processor cores at least-8; - The base clock frequency of the processor is not less than-not less than 3.6 GHz with a maximum frequency in overclocking mode of not less than 4.9 GHz; - Processor cache memory not less than-not less than 16MB; - Compatibility with both 64-bit and 32-bit applications at the hardware level; - The amount of RAM not less than 64GB DDR4 2666; - Ability to expand RAM up to 128GB; - Ability to install memory with ECC support; - At least 4 slots for installing memory modules; - At least 4 SATA interfaces for connecting hard drives and solid-state drives; - A solid-state drive (SSD) is at least 512 GB; - Hard disk at least 4TB SATA 7200RPM; - Hard disk controller with support for RAID levels is at least 0/1; -DVD-RW optical drive; - Video card: discrete, processor frequency not less than 1700MHz, memory capacity not less than 8GB, memory type-GDDR6, memory bus width not less than 256 bit, at least 3 DisplayPort ports, at least 1 HDMI port, cooling system type-active; - Network interface: at least 1 x RJ-45 Ethernet with 100/1000Mbps; - I/o interfaces: at least 6 USB 3.0 ports, at least 2 USB2.0 ports, at least 1 universal audio port, at least 2 audio outputs/inputs, at least 2 DisplayPort ports; - At least 1 PCIe Gen3 x16 slot, at least 1 PCIe Gen3 x4 slot, at least 2 PCIe G3 x1 slots, at least 2 M. 2 slots for SSD installation (PCIe Gen3 x4); - Power supply with a power is at least 650W and an efficiency is at least 90% with active power factor correction; - Russian Keyboard and mouse with scroll wheel; - Warranty is at least 3 years without returning the drives when the warranty is replaced **Monitor features:** - Quantity – not less than 2 units with bracket mount to the table - Panel type-IPS with led backlight; - monitor diagonal is at least 23.8” with an aspect ratio of 16: 9; - anti-glare coating;	**8** (eight)

№	Particulars	Configuration	Units needed
		- native resolution is at least 1920x1080 @ 60 Hz; - number of displayed colors: at least 16.7 million; - brightness is at least 250 cd/m^2; - contrast ratio is at least 1000:1; - response time no more than 5ms; - ports – 1xdisplay Port; 1xVGA, 1xHDMI; - at least 2 USB3.0 ports - viewing angles is at least 178 horizontally and vertically; - support for VESA mounting 100mm; - stand with the ability to adjust the angle of the monitor, adjust the height is at least 100mm, with the ability to rotate in the horizontal and vertical plane; - bracket for installing two displays simultaneously on VESA 100mm mounts from 19 to 27 inches with the ability to adjust the height to 120mm, adjust the tilt angles from -5 to 24 degrees, rotate the monitors in portrait orientation; - Licensed Windows 10 operating system - Warranty is at least 3 years	
9.	**Laptop** based on**:** 2 pcs. in large lecture classes, 6 pcs. in the laboratory.	*Processor:* -microprocessor with an x64 architecture focused on multithreaded computing, with at least 4 cores and a base clock frequency is at least 1.6 GHz and in overclocking mode is at least 3.4 GHz with a level 3 cache is at least 6MB. You must be able to work with 64-bit applications on the hardware level; *Memory and storage of information:* - at least 8GB DDR4 2400; - ability to expand the amount of RAM up to 32GB; - Number of slots for installing memory at least 2; - Hard disk capacity is at least 500GB SATA 7200 RPM; *I / O interfaces:* - at least 3 USB3.0 and higher ports; - at least 1 USB2.0 port; - at least 1 HDMI port; - at least 1 RJ45 port of the 1Gbit/s Ethernet network adapter; - at least 1 universal input for connecting the headset; *Display:* - IPS with LED backlight; - monitor diagonal is at least 15.6” with an aspect ratio of 16: 9; - anti-glare coating; - native resolution is at least 1920x1080 @ 60 Hz; - brightness is at least 250 cd/m^2; - contrast ratio is at least 600:1; - the viewing angles are not less than 85 horizontal, 85 vertical. *Other requirements:* - Graphics video adapter with a memory capacity is at least 2GB DDR3 with a memory bus bit depth is at least 64 bits, processor frequency is at least 900MHz, support for DirectX 12, OpenGL 4; - Multi-language keyboard; - Power supply with a capacity is at least 65W; - Licensed Windows 10 operating system - Warranty is at least 3 years, which does not require the return of	**8** (eight)

№	Particulars	Configuration	Units needed
		drives for replacement.	
10.	**Network sockets RJ-45Cat 6** based on: 120 pcs. for the entire ICT CLC	- Category not lower than cat.6 -Type of installation in gathering with a casing -Type of mounting in the spacer and on the screws - Device width 85 mm - Device height 85 mm - Device depth 33.3 mm - Property of the thermoplastics material - Material: plastic - Suitable for IP20 degree of protection (IP) - Number of modules (for modular series) 2	**120 (**one hundred twenty**)**
11.	**UTP Cat 6 cable** based on: 7000 m. for the entire ICT CLC	- 4-pair cable, category 6 - Data transfer rate up to 1000 Mbit / s when using 4 pairs.	**7000 (**seven thousand
12.	**Connectors RJ-45 Cat 6** based on 480 units for the entire ICT CLC	- The connector type is RJ-45 (8P8C) - Cat 6 category - Bandwidth, 250 MHz - Performance of unshielded - Contact material phos photized bronze with a gold coating of 1.25 microns - Housing material: transparent polycarbonate (PC, UL 94V-2) - Supported tool for crimping and connecting - The thickness of the conductors, AWG 23-25 - Storage temperature, t °C -40 ~ +70 - Operating temperature, t °C -30 ~ +80	**480 (**four hundred eighty)
13.	**Patch panels for 48 ports** based on 4 pcs. per server room	- Number of ports 48 - UTP capping and casing - Cat Category. not less than 6E - Constructive 19" - Patch panel type Network RJ-45 - Built-in cable organizer is available - Mounting height 1U	**4 (**four**)**
14.	**HDMI cable 10 m** based on: 15 pcs for the entire ICT CLC	- Interface: HDMI type a / a plug-in; - Support HDMI2.0 4K@60HZ; - Video signal resolution: 480P, 720P, 1080i,1080P, 3D,4K@30Hz,4K@60Hz - Bandwidth: 18.2 Gbps (6Gbps x 3); - Support for HDCP2.2/CEC/EDID/HDR; - Transmission of high-frequency signals via optical fiber, without EMI, without signal loss; - 4.8 mm outer diameter;	**15 (**fifteen**)**
15.	**HDMI cable 20 m** based on: 5 pcs for the entire ICT CLC	- Interface: HDMI type a / a plug-in; - Support HDMI2.0 4K@60HZ; - Video signal resolution: 480P, 720P, 1080i,1080P, 3D,4K@30Hz,4K@60Hz - Bandwidth: 18.2 Gbps (6Gbps x 3); - Support for HDCP2.2/CEC/EDID/HDR; - Transmission of high-frequency signals via optical fiber, without EMI, without signal loss; - 4.8 mm outer diameter;	**5 (**five**)**

№	Particulars	Configuration	Units needed
16.	**HDMI cable 5 m** based on: 5 pcs for the entire ICT CLC	-Interface: HDMI type a / a plug-in; - Support HDMI2.0 4K@60HZ; - Video signal resolution: 480P, 720P, 1080i,1080P, 3D,4K@30Hz,4K@60Hz - Bandwidth: 18.2 Gbps (6Gbps x 3); - Support for HDCP2.2/CEC/EDID/HDR; - Transmission of high-frequency signals via optical fiber, without EMI, without signal loss; - 4.8 mm outer diameter;	**5 (**five**)**
17.	**HDMI splitter (splitter)** based on: 5 pcs. for the entire ICT CLC	- Support HDMI 1.4 b - HDCP 1.2 support - Support Ultra HD (4kx2k) - CEC - Indication of active inputs and outputs - Supported resolution: -480i@60Hz,480p@60Hz,576i@50Hz,576p@50Hz,720p@50/60 Hz, 1080i@50/60Hz,1080p@50/60Hz, 1080p@24Hz 3D,720p@50/60Hz 3D, 4x2k - Color rendering 24bit / dark color 30bit dark color 36bit - Video format: -DTS-HD/Dolby-true HD/LPCM7.1/DTS/Dolby-AC3/DSD - Maximum transfer rate of 10.2 Gbps (340MHz) - Cascading Of 3~4 Layers - HDMI connectors: type A 19-pin female - Operating temperature: +5 - +35°C - Relative humidity: up to 85% - Metal case - Power supply: Input: ~ 220V / Output: +5V - Maximum cable length for input 15 m (for 4K resolution-12 m), for output 25 m (for 4K resolution-15m)	**8 (**eight**)**
18.	**3D scanner** based on: 1 pc. to the laboratory for 3D modeling and creation of virtual reality software	- Weight, less than 2 KGs - OBJ , STL , ASC , PLY , P3 file formats - Ability to capture texture Yes (with color scanning module) - Scan time is less than 1 second. - Depth of field, mm ±100 - Scan area 135x100 mm-225x170 mm - USB 3.0 interface - LED light source - Minimum system requirements video: NVIDIA GTX770 and above; video memory over 4G; CPU: i7 and above; RAM: 16G and above - Volume accuracy 0.3 mm - Working distance 400 mm - Distance to the point 0.2-2 mm - Scanning speed of 20-30 fps, 100,000 dots / s - Scanning accuracy up to 0.05 mm	**1 (**one**)**
19.	**Head-mounted display** based on: 4 pc. to the laboratory for 3D modeling and creation of virtual reality software	Set of**:** -HTC VIVE virtual reality helmet-1pc. -VIVE controllers 2 pcs. -Base stations 2 pcs. -Power cables 1 PC. -Face plates 2 pcs.	**4 (**four**)**

№	Particulars	Configuration	Units needed
		-Nose pad 1 PC. -3-in-1 cable - 1 PC. -Communication module - 1 PC. -Earplugs - 1 PC. -Cables, chargers and accessories (set) - 1 PC. -Specifications: -Display resolution of 1080 x 1200 pixels for each eye (2160 x 1200 pixels for both eyes) -The viewing angle is 110 degree -The corners of the steps of positioning systems 120 degrees -Display diagonal 3.6 inches -Refresh rate of 90 Hz -Wire length 4.5 meters -Steam VR platform -Compatible with PC and Windows OS -Adjusting the lens / focal length -Head –mounted display weight 512 grams -Helmet features Support for 2 HTC base stations -Steam VR Tracking sensors, accelerometer, gyroscope, proximity sensor -Interfaces 1x USB 3.0; 1x HDMI 1.4	
20.	**Virtual platform** based on: 1 pc. to the laboratory for 3D modeling and creation of virtual reality software	Set of**:** -Kat Walk Platform -Module for visual display and management of equipment with the KAT STATION server -Kat FIRE game gun -3 pairs of pads for KAT SHOES -Kat SENSOR Suite for the KAT SPACE platform -Mounting kit with keys, grease, etc. -HTC VIVE - complete set including controllers, helmet, laser trackers and wires -Set of KAT CABLE cables and adapters -Set of 11 different KAT GAMES (upgradable and updated)	**1 (**one**)**
21.	**Video camera:** based on 1 piece per multimedia lab	- 4K camcorder with fixed lens AG-DVX200 - 4/3 type MOS - 12 stages of dynamic range - DCI 4K 24P, UHD 4K up to 60p - Variable frame rate up to 120 FPS in ARV - Recording in MP4 / MOV in 4K - Integrated Leica Lens having f / 2.8 – f / 4.5 lens and at least 13 x zoom - 3 x Separate control ring of the lens - 2 CD card slots (compatible with U3) - HDMI 2.0, 3G - SDI output. - Optical image stabilizer	**1 (**one**)**
22.	**Memory card:** based on 3 pcs. per multimedia lab	- 256GB professional 1000 x UHS-II SDXC SDXC memory card (class 10, UHS speed class 3)	**3 (**three**)**
23.	**On-camera MIC gun** based on: 1 pc for multimedia lab	- Narrow-focus microphone (gun) mounted on the AG-DVX200 Camera	**1 (**one**)**

№	Particulars	Configuration	Units needed
24.	**Battery for the camera** based on: 3pc for multimedia lab	- Battery for the camera 4K camera – VW-VBD58 (7.2 V, 5800mAh)	**3 (**three**)**
25.	**On-camera lamp for 4K camcorder** based on: 1 pc for multimedia lab	- On-camera two-color led camera light for AG-DVX200 4K camcorder -Variable color 3200 to 5600K -Dimming from 100 to 10% -Power consumption-12W -Compatible with SONY L-series batteries -1/4 "-20 threaded hole -D-Tap power cable -Spherical Shoe mounting adapter -Removable doors and filter diffuser	**1 (**one**)**
26.	**Battery for on-camera lamp** based on:2 pc for multimedia lab	-NP-F975 Li-ion battery (7.4V, 7800mAh)	**2 (**two**)**
27.	**Charger for on-camera lamp** based on: 1 pc for multimedia lab	- Compact AC/DC charger for l & M series batteries	**1 (**one**)**
28.	**Camera bag** based on: 1 pc for multimedia lab	- Portable bag for 4K AG-DVX200 camera	**1 (**one**)**
29.	**Tripod for 4K camcorder** based on: 1 pc for multimedia lab	- 509hd head + 545 tripod with lower stretch - Material: aluminum. - Maximum load: up to 13.5 kg - Optimal load: up to 12.8 kg - Maximum height: 172cm - Minimum height: 48cm - Folded length: 84cm - Bridging Technology - Variable resistance when panning - ABR balancing system with indication - 4 balancing options - Extended and extended platform for camera installation - Included: head, tripod, lower stretch, cover.	**1 (**one**)**
30.	**Camera stabilizer** based on: 1 pc for multimedia lab	- Inline function - Operating mode: - Suspension - Inverted - Portable - Built-in independent ins module - DJI stabilizer motors with encoders - Bluetooth module - USB connector - 2.4 GHz receiver - Temperature sensor 32-bit CPU - D-Bus support - Current-static current: 300 mA (at a voltage of 16 V) - Dynamic current: 600 mA (at a voltage of 16 V) - Max. current of the locked rotor: 10 A (at a voltage of 16 V) - Operating temperature range-15°...+50° C (5°-120° F) - Weight with handle: 2.3 kg (5.07 lb)	**1 (**one**)**

№	Particulars	Configuration	Units needed
		-Stabilizer dimensions (W x D x H)500 x 210 x 420 mm PERIPHERY - Camera holder size max. depth from center of gravity to camera mounting plate: 120 mm - Max. height from the top of the camera mounting plate: 195 mm - Max. width: 160 mm - Connectors for additional devices: - Adjustable 12 V P-Tap connector (2), - USB 500mW (1), DJI Lightbridge (1)power supply for the control unit battery Ronin-M 4S - Communication interface - 2.4 GHz remote control, - Bluetooth 4.0, USB 2.0 Min.	
31.	**Lighting kit** based on: 1 pc for multimedia lab	- Two-color lighting led panel 2x S-2410C (2 devices); - Bi-color Edge Mounted led lighting panel for Studio and out-of-Studio shooting. - Includes 2 tripods, a set of 2 batteries and 2 NP-F975 chargers. - Led panel-240 high-brightness LEDs. - Light intensity at 1 meter 1065Lux, at 2 meters 350Lux. - The angle of the light flux of 75°. - Color temperature, changeable 3200K° - 5600K°. - Power consumption is not more than 60W. - 12-17V power supply. - Platform for self-powered V-lock or DV (Sony F-970). - Weight: 2.85 kg, Diameter: 520mm, Thickness: 50mm	**1 (**one**)**
32.	**Digital camera** based on: 1 pc for multimedia lab	- 35mm 30.4-megapixel EOS 5D Mark IV camera, with 36x24mm full-frame CMOS sensor - The image processor, the DIGIC 6+ - 3.2-inch LCD touch monitor with a diagonal of 1.62 m - DCI 4K video at 30 frames per second; - 8.8 MP Still Grab - 61-point high-density mesh autofocus - Native ISO 32000 extended to ISO 102400 Dual Pixel RAW; - AF zone selection button - Dual pixel CMOS AF and movie server AF 7 frames per second; - CF and SD card slots - Built-in GPS and Wi-Fi with NFC	**1 (**one**)**
33.	**Standard lens for the camera** based on: 1 pc for multimedia lab	- EF 24-105mm f/4 IS II USM standard zoom lens for Canon EF 35mm SLR cameras; - Angle of view (horizontal, vertical, diagonal) - 74°-19°20', 53°-13°, 84°-23°20'; - Lens design (elements/groups) - 17/12; - Number of diaphragm lobes-10; - Minimum aperture-22; - Minimum focal length (m) - 0.45; - Maximum magnification (x) - 0.24 (at 105 mm); - 4-step image stabilizer; - Autofocus drive-ring type ultrasonic motor.	**1 (**one**)**
34.	**Wide angle lens for camera** based on: 1 pc for multimedia lab	- EF 16-35mm f/2.8 L III USM-high-speed wide-angle lens with variable focal length for 35mm Canon EF SLR cameras; - Angle of view (horizontal, vertical, diagonal) 98°-54°, 74°10'-38°, 108°10'-63°;	**1 (**one**)**

№	Particulars	Configuration	Units needed
		- Lens design (elements/groups) - 16/11; - Number of diaphragm lobes-9; - Minimum aperture-22; - Minimum focal length (m) - 0.28 - Maximum magnification (x) - 0.25 (at 35mm)	
35.	**Lens body (zoom) for the camera** based on: 1 pc for multimedia lab	-EF 70-200mm f/2.8 L IS II USM high-Performance telephoto lens with variable focal length for 35mm Canon EF SLR camera; - Angle of view (horizontal, vertical, diagonal) 29°-10°, 19°30'-7°, 34°-12°; - Lens design (elements/groups) - 23/19; - Number of diaphragm lobes-8; - Minimum aperture-32; - Minimum focal length (m) – 1.2 - Maximum magnification (x) - 0.21 (at 200mm); - Autofocus drive-ring ultrasonic drive (USM) - Water - / dust-proof housing	**1 (**one**)**
36.	**Tripod type monopod** based on: 1 pc for multimedia lab	- Tripod type monopod MVMX PROA42WUS; - Load capacity-up to 5kg; - Max. height-79.9"; - Closed length – 30.7 in"; - Sections-4; - Weight-2kg; - Pan and tilt head; - Full liquid base; - Fast-acting flip locks; - D-shaped anti-explosion tubes; - Rubber handle; - Strap; - Case.	**1 (**one**)**
37.	**Memory card** based on: 3 pc for multimedia lab	- 256GB Extreme Pro Com fast Flash memory card (160mb/s)	**3 (**three**)**
38.	**Battery for the camera** based on: 3 pc for multimedia lab	- LP-E6N Li-ion battery for camera - Mark IV (7.2 V, 1865mAh)	**3** (three)
39.	**Camera bag** based on: 1 pc for multimedia lab	-Sling-Style backpack and case for 5D Mark VI camera (black)	**1 (**one**)**
40.	**Photoflash** based on: 1 pc for multimedia lab	- External Speed lite 600EX II-RT flash for EOS cameras; - SBA-E3 reflector adapter; - Color filter SCF-E3OR1; - Mini stand; - Soft case; - St-E3-RT Speed lite transmitter; - Quick charger Watson – with 8 cells for AA / AAA NiMH or NiCd batteries; - 2 packs of MX AA NiMH batteries-Watson (1.2 V, 2550mAh); - Universal accessory Shoe Vello – (Universal Accessory Shoe Mount) - 2 pcs.	**1 (**one**)**
41.	**MQ-300 Studio light set for photography** based on: 1 pc for multimedia lab	- Studio flash MQ-300-3 pcs; - Protective cap for flash – 3 pcs; - Modeling lamp 75 W – 3 pcs; - Power cable – 3 pcs;	**1 (**one**)**

№	Particulars	Configuration	Units needed
		- Sync cable – 1 pc.; - Soft box 50x70cm – 1 pc.; - Studio stand – 3 pcs; - Standard reflector – 2 pcs; - BD-200 reflector (blinds, honeycomb, color filters) - 1 pc; - Snoot reflector (tube, honeycomb, color filters) - 1 pc; - Photo zone for reflection 82cm silver-1 pc; - Radio synchronizer VS-604AC - 1 pc.; - Bag for Studio light – 1 pc.	
42.	**Action camera (with a set of accessories)** based on: 1 pc for multimedia lab	- Hero-5 action camera or higher as a video recorder for recording video with 4K resolution-30 fps, 1080p-120 fps, 720p-240 fps, 1080p-120 in Looping Video mode; - Photo – 12MP with support for RAW format; - Electronic stabilization when shooting; - Night Lapse Mode; - Wide viewing angle Super View: - Hi Light tag function; - Control the camera both from the remote control and via a smartphone or tablet (via Wi-Fi and Bluetooth); - Battery – 1220 mAh.	**1 (**one**)**
43.	**Steadicam manual stabilizing with camera** based on: 1 pc for multimedia lab	- Steadicam manual stabilizing Zenmuse X3 with X3/FC350H camera. with additional battery HB01-522365. - Xthree1 / 2. 3 CMOS number of effective pixels-12.4 MP (total number of pixels-12.76 MP) - FOV 94 lens, 20mm (equivalent to 35mm format) f/2.8 focus 3.5 m; - ISO range 100-3200 (video); 100-1600 (photo); - The range of shutter speed 8-1/8000S (up to 30 sec in manual mode) - Max. image resolution 4000x3000 pixels; - Photo modes time-lapse burst shooting -3/5/7 frames, automatic exposure correction 0.7 EV in 3/5 step increments, self-timer Time laps	**1 (**one**)**
44.	**Wireless microphone combo system** based on: 2 pc for multimedia lab	- Ek 100 G3 belt receiver; - SK 100 G3 transmitter; - Me 2 clip-on lapel microphone; - SKP 100 G3 Converter - Tunable frequencies at 42 MHz - 1680; - Auto-scan frequency of searching of open ranges; - 3-level noise canceller to block interference; - 20 banks with 12-channel presets	**2 (**two**)**
45.	**Lavalier microphone with cable** based on: 3 pc for multimedia lab	- Omnidirectional lapel condenser microphone ECM-77BMP with power supply; - Cable – 3x2, 3mm	**3 (**three**)**
46.	**Reporter microphone with cable** based on: 1 pc for multimedia lab	- Reporter dynamic microphone the MD 42 - Orientation-circular; - Frequency range-40-18000 Hz; - Sensitivity-2.0 mV / PA; - Rated resistance-350 Ohms; - Dimensions 49x250mm - Weight-360 g.	**1 (**one**)**

№	Particulars	Configuration	Units needed
47.	**Sound mixing console** based on: 1 pc for multimedia lab	- ProFX8v2 sound mixer - Inputs: 2 mono mic/line + 2 stereo mic/line + 1 stereo line input; - Outputs: 2 mono mic/line + 2 stereo mic/line; - Active channel sensitivity: adjusts the input sensitivity in the range-60dB ~ -16dB for microphone input and-34db ~ +1odb for linear input; - Equalization – 3-band equalizer in channels 1,2,3/4, and 5/6, 2-band in channels 7/8; - Microphone preamps-4 (low noise with phantom power); - Fader type-60mm; - Number of SPX effects-16; - AUX-1 Aux send + stereo Aux return, easy one-knob-compressors (CHI+2)	**1 (**one**)**
48.	**Control speaker** based on: 4 pc for multimedia lab	- Ms40 phase-inverted monitor loudspeaker - Two-way shelf speaker - Integrated amplifier - Power – 20W - The range chatot 50-25000 Hz - Dimensions (WxHxD) - 173x279x245 mm.	**4 (**four**)**
49.	**External array for online data storage** based on: 2 pc for multimedia lab	- RAID array Rocket Stor 6314A Thunderbolt 2 of 4-bays for a set of disks (4x10TB) on 40TB of memory; -3.5 " 10TB NAS hard drives – 4 PCs. -4 x 3.5" and 2.5" SATA / SAS drive bays -2 x Thunderbolt 2 ports -RAID 0, 1, 5, 6, 10 and JBOD -Windows operating system	**2 (**two**)**
50.	**Portable hard drive** based on: 2 pc for multimedia lab	-Capacity - 10TB, USB 3.0, Interface	**2 (**two**)**
51.	**MCU server** из based on 1 pc to server room	**<u>General Specification</u>** :- -The MCU should be running on a dedicated applicance. The hardware, software should be supplied and supported by a single OEM. -All necessary hardware to support the required capacity needs to be supplied from day one. Each of the server supplied for the MCU must have a redundant power supply from day1. -The MCU must also support Full HD mode and it must provide a capacity of connecting at least 55 sites @1080p30 fps day one or 110 sites @ 720p30fps or 200 sites @SD30fps. -The MCU must be able to host at least 5 simultaneous conferences each having different capacities restricted by the maximum port capacity of the MCU. -Additionally, MCU should support atleast 30 Personal Meeting Rooms, which can be assigned to officials for their meetings. - MCU should be capable of supporting participants using various means i.e. via video enabled phones, room based video endpoints, soft clients on mobile/tablet or via the browser using WebRTC compatible browsers in a single conference. The meeting quality has to be consistent and of high quality. The end points can be	**1** (one)

№	Particulars	Configuration	Units needed
		present on the WAN network or on the internet. In case additional components are required for this functionality, all additional components required to have this functionality has to be included in the solution. - The MCU should have the capability to host meetings with internal and external participants in a secure way such that it should co-exist with the enterprise security policies. -The MCU solution should support H323 and SIP protocols. - The MCU must support the concept of virtual meeting rooms to users who Hosts meeting frequently. Such meeting rooms should support dialing in from standard based video end points, internal and external users and browser based clients. The system should allow one Virtual meeting room per employee, however it should not consume resources when not in use. -The MCU should be able to maintain the dynamic resource allocation capacity for 1080p, 720p and SD participants simultaneously without having to reboot or change any configuration. -The MCU should support 110 ports or more at HD 720p (transmit and receive) up to 4Mbps on IP in continuous presence mode with 30fps, 100 WebRTC connections and H.264 resolution and AES encryption on the same MCU. -The MCU should have Chat Functionality for WebRTC Users during Meeting. -The MCU should have far end camera control. -It should be possible for the MCU administrator to move participants from one conference to another conference from the MCU management panel. -The MCU should display a security icon on the endpoint if the conference is secure. -The administrator should be able to specify maximum resolution for main video and content. -It should allow to change the participants name in a live a conference. -Video conferencing endpoints deployed at other organization must be able to take part in video conferencing. The MCU should be OEM agnostics and should be compatible with endpoints can be of various OEM makes complying with standard H.323/SIP & H.264 ITU-T standards. -Interoperability with all organization must be possible using standards based dialing methodology using the Internet. -The MCU should be able to integrate with Call Control system using SIP/H.323. **<u>Video Standards</u>** : -Should support H.263/H.263+/H.263++, H.264 video algorithms	

№	Particulars	Configuration	Units needed
		Video Resolution : - Should support video resolution from SD to Full HD to join into a conference. - The proposed MCU should be able to combine HD and SD in the same conference without degrading the HD resolution from and to the HD endpoints. The MCU shall interoperate with multiple vendors' endpoints. The supported mediums should be IPv4 and IPv6. **Audio Standards** : - Along with the support for basic algorithms like G.711 and G.722.1 the MCU should also support wideband Audio protocols like MPEG 4 AAC - LC or MPEG 4 AAC - LD or equivalent. **Transcoding & Rate Matching** : -The MCU should support transcoding of different Audio/video Protocols. -MCU should be able to combine HD and SD in the same conference without degrading the HD resolution from and to the HD endpoints. **Dual Video** : -The MCU should have H.239/BFCP protocol for sending and receiving dual video streams (Presenter + Presentation). **Video Layouts** : -At least 25 sites to be seen simultaneously on the screen in traditional Continuous Presence mode. -The MCU must also support advanced continuous presence such that the site that is "on-air" to be seen on a larger window and the other sites are seen in smaller quadrants. **Security Features** : -The MCU must be a secure Non-PC Hardware with a strong operating system. The Hardware and software must be from the same OEM. -The MCU should support 128 Bit strong AES encryption for calls and H.235 for authentication. -The MCU must support encryption for calls on SIP. **Network /USB Interface** : -At least 1 LAN /Ethernet--10/100/1000 Mbps full duplex and dedicated serial/USB connection for maintenance/upgrade. -End to End Solution, Including MCU, Call Control, Firewall Traversal, Desktop/Mobile Clients / WebRTC Solution should be IPv4 and IPv6 complied day one. **Conference Layout** : - MCU Solution should support minimum of 10 or more layouts.	

№	Particulars	Configuration	Units needed
		-The MCU should have Customised Layout option. Adminsitators can create their own customised layout as per requirement with upto max 25 sites on screen. **Other applications** : -Any requirement of hardware or software such as DNS, NTP, LDAP, Certificates etc required for successful implementation of the MCU should be supplied as part of the solution. **Firewall Traversal** : -Should be supplied with firewall traversal solution for Business to Business (B2B) Video Calling for 80 concurrent calls with users joining the conference from studio based endpoints/Desktop/laptop. Any hardware/VM licenses required for the same should be supplied as part of the solution. **Gatekeeper** : -Should be supplied with a Gatekeeper solution for Video URL dialing for 100 registrations/calls with users joining the conference from studio based endpoints/Desktop/laptop. Any hardware/VM licenses required for the same should be supplied as part of the solution. **Recording & Streaming (Optional)**. -The solution should be supplied with hardware & software for IP based recording of 2 concurrent sessions & 1 live streaming for 50-100 web viewers. **Misc** :- - Warranty is at least 12 months. - Guaranteed replacement of hard drives without removal from the territory of the Academy of the Armed Forces of the Republic of Uzbekistan.	
52.	**Virtualization server**	*Form-factor:* ‣ the server is made in the rack form factor (design) for installation in the 19 server Cabinet of the EIA-310D standard; ‣ height not more than 2U; *Processor:* ‣ Two server microprocessors with x86 architecture, oriented to multithreaded computing, with at least 18 cores and operating at a frequency is at least 2.60 GHz must be installed. ‣ You must be able to work with 64-bit applications at the hardware level; *Memory and data storage:* ‣ at least 128GB of DDR4 2933 ECC RAM must be installed, and the modules must support detecting and correcting more than one error; ‣ the number of memory slots must be at least 24; ‣ the number of slots for installing 2.5 form factor disks is at least 2; ‣ support for installing SAS, SATA, SSD, NVMe SSD drives;	**3 (**three**)**

№	Particulars	Configuration	Units needed
		‣ at least 2 solid state drives is at least 64 GB must be installed; ‣ ability to install and download from micro SD cards; *Network interfaces, I / O ports:* ‣ there must be at least 2 x 10 GB Base T and 2 x 1 GB Base T RJ-45 management port; ‣ two-port network adapter with a bandwidth is at least 10Gbit/s must be installed with support for I / o virtualization functionality – the ability to divide each port into 4 network interfaces, must support the functionality of individual bandwidth control on each of the network interfaces; ‣ at least three USB interfaces located on the outside of the case; ‣ at least one USB 3.0 interface located inside the enclosure; ‣ dedicated port is required to manage the server with a license for full KVM functionality; ‣ at least 3 PCIe 3.0 slots for installing adapters; ‣ at least one Micro SD High Capacity card slot; ‣ at least 2 SFP+ SFP+ 10Gbps direct connection cables are included; ‣ at least 2 two-port Fibre Channel adapters must be installed with a bandwidth is at least 16 Gbit / s per port; ‣ FC the FC adapter must support loading the operating system from the storage system, not loading the server CPU (Full Hardware Offload), NPIV; *Power supply, cooling:* ‣ ‣ at least 2 hot-swappable power supplies is at least 800W must be installed; ‣ the server must support the ability to hot swap the cooling modules; *Operating system:* *Warranty* ‣ Warranty is at least 3 years without returning the drives when the warranty is replaced	
53.	**Virtualization software**	The virtualization software must meet the following requirements: Installing a hypervisor on bare metal); Support for 32-and 64-bit guest operating systems (OS); Support for up to 128 virtual processors; Hot add processors, RAM, and other devices to a running guest OS; Support for advanced physical host RAM optimization mechanisms (page deduplication, dynamic distribution, swap upload, compression, etc.); Hot-add and increase the size of virtual disks for a running guest OS; Integration with storage systems to improve the performance of operations of input-output; Creating virtual machines with up to 1TB of RAM; Support for USB 3.0 devices in virtual machines; Creating virtual machines with dynamically expanding disks (allocating space as it fills up); Building clusters for fault tolerance with minimal VM interruption (High Availability); Migrating VMS between hosts without downtime;	**1 (**one**)**

№	Particulars	Configuration	Units needed
		Providing support for virtual switches with Port Groups, Traffic Shaping, and VLAN technologies; Centralized management of licenses, host and VM updates; Different levels of user access, with the ability to delegate access rights and permissions to each subsystem separately; Support for custom VM templates (VM Template) Availability of a web client for centralized management of the virtual infrastructure; Integration with backup systems; Software licenses for 3 servers; SOFTWARE support must be at least 3 years from the vendor.	
54.	**Storage system**	*Form-factor:* ‣ installation in the 19 server Cabinet of the EIA-310D Type A standard; *Disk space in the storage system:* ‣ At least 12 disks 1.8 TB 12G SAS 10k HDD; ‣ Expandable disk space - at least 7 additional expansion modules; *Configuration:* ‣ the data storage system must be supplied with at least two (2) controllers in a single system; ‣ access to volumes and/or to each volume at the same time must be provided in the active-active mode from all controllers at the same time; ‣ the system must support expansion with Enterprise SAS, Nearline SAS, and SSD disks; ‣ The total amount of cache memory in controllers must be at least 16GB, at least 8GB per controller; ‣ The ability to use SSD disks in storage simultaneously as caching read requests, creating volumes, and multi-level data storage between different types of disks; ‣ At least 2 hot-swap power supplies in the controller shelf and expansion shelves; ‣ Interface for connecting additional SAS extension shelves is at least 12Gb / s; *Number of ports:* ‣ At least 4 x 16gbit/s Fibre Channel ports on each controller with SFP modules and optical cables installed; ‣ To ensure high availability and performance, each disk shelf must be accessible from each controller. *System and data management:* ‣ The system must support different RAID levels, namely RAID 1, 5, 6, 10. ‣ The storage system must ensure that the logical disk data being written is distributed to all disks in the storage pool; ‣ The system must provide multi-level storage and data transfer between different types of disks for optimal use of the system resource (tiering). *Availability:* ‣ Microcode and software upgrades must occur without stopping the system and service, including updates to Nearline SAS disk micro codes. ‣ The system must maintain continuous operation in the event of	**1 (**one**)**

№	Particulars	Configuration	Units needed
		failure of: disk, power supply, controller, port, memory, fans. ‣ The cache memory must support data flushing to disk in case of power loss, in addition to protecting the cache memory with a battery. *Compatibility and integration:* ‣ The system must support the following operating systems: Microsoft Windows Server 2012/2016, RedHat EL, SUSE EL, VM ware ES Xi; ‣ The system must be compatible with the built-in MS Windows, Linux, UNIX, VMware operating systems, and data channel redundancy (multipathing) services to ensure fault tolerance and performance of data access; *Technology for efficient resource allocation (Thin Provisioning):* ‣ Support for efficient resource allocation for all applications and all volumes should be provided. ‣ System must support the allocation and deletion of blocks of zeros for space reclamation when data is deleted to increase the efficiency of disk space usage. *Technology for creating instant snapshots of dedicated resources – (Snapshots):* ‣ The system must support snapshot technology (virtual snapshots of the volume state) and volume cloning for the entire space; ‣ The system must support data migration without interrupting the service to another system (of the same type) if necessary; ‣ Support for at least 512 snapshots; *Warranty* ‣ Warranty is at least 3 years, without returning the discs to the manufacturer.	
55.	**Backup system**	*Form-factor:* ‣ installation in the 19 server Cabinet of the EIA-310D Type A standard; *Backup coping:* ‣ backup speed is at least 7TB / hour; ‣ backup speed when using data transfer optimization technologies at least 15TB / hour; ‣ support for replication to a remote backup system; ‣ support for data transfer optimization technologies; ‣ block-level deduplication support; *Capacity:* ‣ the volume of the backup system is at least 36TB of usable space; ‣ maximum possible capacity: at least 100TB of usable space; *Port/network interface configuration:* ‣ at least 4 x 1Gbit/s RJ-45 ports; ‣ dedicated system management port; *Integration:* ‣ integration with Symantec Net Backup, CommVault Simpana, Veeam, HP Data Protector, and other backup systems; *Warranty* ‣ Warranty is at least 3 years, without returning the discs to the manufacturer.	**1 (**one**)**

№	Particulars	Configuration	Units needed
56.	**Backup system software**	**The backup system software** must meet the following requirements *Restoring virtual machines:* ‣ Restore the entire VM on the source server or any other server; ‣ Quick rollback functionality for restoring only changed data blocks; ‣ Support for instant VM recovery from a backup file on the backup storage system; ‣ Restore individual virtual machine files and virtual disks; *Files restoration:* ‣ ‣ Restore files of file systems used in Windows, Linux; ‣ Restore individual VMS, guest OS files, and application objects from EMC VNX, VNX2, and VNXe hardware snapshots, Hewlett Packard Enterprise (HPE) 3par Store Serv, Store Virtual, and Store Virtual VSA, as well as Net App Data ONTAP (FAS, Flex Array V series, Data ONTAP Edge), and others.; ‣ Simultaneous recovery of multiple Active Directory objects, such as user and computer accounts (directly in Active Directory or by exporting in LDIF format), recovery of passwords, containers, and group policy objects; ‣ Restore Exchange objects and then save them, send them by email, or export them to the PST archive, or restore them to the original mailbox; ‣ Support for running a VM from a backup in an isolated environment, for Troubleshooting and testing without affecting the production environment. Ability to create a VM copy from hardware snapshots. Functionality for testing the possibility of recovery without pre-recovery of the VM; *Backup coping:* ‣ Creating consistent VM backups at the image level based on application state; ‣ Fast incremental backup of individual VMS using an existing backup job; ‣ Creating backups and replicas at the VM image level using EMC VNX and VNXe hardware snapshots, HRE 3par Store Serv, Store Virtual, Net App Data ONTAP (including FAS, Flex Array V-Series, Data ONTAP Edge), and others; ‣ Built-in features for deduplication, data compression, and exclusion of paging file blocks; ‣ Archiving VM files and backups to stand-alone tape devices or libraries (including virtual ones) connected to any Microsoft Windows server on the network; ‣ I / O monitoring functionality must be supported to ensure that backup and replication processes do not adversely affect running systems; ‣ Integration with stores that support hardware deduplication, such as EMC Data Domain Boost, NRE Store Once Catalyst, Exa Grid Accelerated Data Mover, and others; ‣ Ability to track changed data blocks to reduce backup time; ‣ Support for VM warev Sphere and Microsoft Hyper-V; *Support and licenses:*	**1 (**one**)**

№	Particulars	Configuration	Units needed
		‣ Licenses for virtual environment backup software must cover the entire number of servers; ‣ SOFTWARE support must be at least 3 years old from the vendor	
57.	**Licenses for the Microsoft Windows Server operating system**	License right to operate 5 virtual machines on 3 servers of the virtualization system in fault tolerance mode.	**1** (one)
58.	**Firewall** based on : 1 pcs in a server room, 1 PC in a laboratory of ICT and cyber security	**Requirements for technical and functional characteristics** Configuration: ‣ at least 2 Ethernet ports 10/100/1000 WAN ‣ at least 14 Ethernet 10/100/1000 LAN ports ‣ at least 2 SFP ports, 1 Gbit/s Ethernet ‣ at least 1 USB 2.0 port ‣ at least 1 dedicated RJ45 port for management Productivity: ‣ Bandwidth in the firewall mode is at least 7gbit / s ‣ Bandwidth in IPS mode is at least 500 Mbit / s ‣ NGFW bandwidth is at least 360 Mbit / s ‣ Bandwidth in SSL Inspection mode is at least 120mbit / sec ‣ Bandwidth in SSL-VPN mode is at least 250mbit / sec ‣ IPsec VPN bandwidth is at least 4 Gbit / s ‣ Availability of a real-time anti-virus scan module for passing traffic Fault-tolerance ‣ Ability to combine two devices into one virtual device; ‣ Active/Active and Active/Passive clustering work times are possible; Completeness: ‣ Can be installed in a 19 " server rack with a maximum of 1U; ‣ Availability is at least 2 1Gbit/c SFP LX transceivers; ‣ License for 80 clients, including antivirus, end-user protection, telemetry, and endpoint verification for compliance with security requirements; Warranty ‣ Warranty for at least 3 years. Subscription for security signature updates for at least 3 years.	**2 (**two**)**
59.	**Data network access switch** based on: 3 pieces to the server room, 1 piece to the ICT and cybersecurity laboratory	Configuration: ‣ at least 48 10/100/1000 Ethernet RJ-45 PoE ports+; ‣ at least 4 100/1000 Ethernet SFP ports; ‣ at least 1 dedicated RJ-45 port for the management network; ‣ at least 1 dedicated console port; ‣ at least 1 USB port ‣ at least one additional slot; Productivity: ‣ Switching matrices - at least 176 Gbit / s; ‣ Stacking – at least 100gbit/c of the stacking module; ‣ Bandwidth – at least 100 million packets per second. ‣ the size of the routing table is at least 2000 entries (IPv4), 1000 (IPv6) ‣ MAC address table size – at least 32000 entries (IPv4) IPv6 support	**4** (four)

№	Particulars	Configuration	Units needed
		Routing protocol: ‣ Static, OSPF v2, OSPF v3, RIP2, RIPng . ‣ Functional support: ‣ Quality of Service, Class of Service, Traffic prioritization, Rate Limit; ‣ IGMP Snooping, STP, RSTP, Jumbo frame, ‣ BPDU port protection, DHCP protection, Dynamic ARP protection, Port security, ‣ Access control lists (ACLs); port-based network access control (IEEE 802.1 x). ‣ Number of VLANs/VLAN IDs at least 2000; ‣ Manageability: ‣ RMON, SNMPv1, v2, v3, NTP, Secure FTP, SSH, RADIUS/TACACS+; ‣ Out-of-band interface (traffic isolation).) ‣ OpenFlow or sFlow support; ‣ Fault-tolerance: ‣ ability to combine up to 8 devices in a fault-tolerant stack, ‣ support for VRRP, Multiple STP, LACP; ‣ Equipment: ‣ height not more than 1U; ‣ availability of a set of mounts for installation in a standard 19 " rack; ‣ switch stack module with a cable length is at least 1 meter; ‣ switching module with 4 ports of 10 Gbit/c SFP+; ‣ at least 2 SFP + 10Gbit/s modules for communication over a single-mode optical cable at a distance is at least 3km. ‣ at least 2 SFP 1Gbit / s modules for communication over a single-mode optical cable at a distance is at least 3km ‣ at least 2 power supplies; ‣ Warranty is at least 3 years.	
60.	**Router for 10 ports (Router with optical SPF module)** based on : 1 piece to the ICT and cybersecurity laboratory	**Purpose:** To establish a connection between different network segments **Requirements for the router** -Ports configuration: • at least 1 SFP 1Gbit/s Ethernet WAN port • at least 1 RJ45 1Gbit/s Ethernet WAN port • at least 7 LAN ports RJ45 1Gbit / s Ethernet • at least 2 free expansion slots -Productivity: • routing - at least 900 thousand 64 byte packets per second • IP Sec VPN bandwidth-at least 380mbps/s - size of the routing table – at least 200,000 entries (IPv4) - the number of VPN tunnels – not less than 800 - Routing protocols: Static IPv4, IPv6, RIP, OSPF, OSPFv3, BGP-4, BGP+, IS-IS - Security: support for access control lists (Access Control List – ACL), TACACS+, RADIUS, SSHv2, NAT, URPF, IP Sec VPN (DES, 3DES, AES 128/192/256), storm protection in the network. - Manageability: support for hierarchical structure of CLI, SNMPv1, v2, v3, RMON, NTP, FTP, TFTP, SFTP	**1** (one)

№	Particulars	Configuration	Units needed
		- Fault tolerance: ability to combine multiple devices into a fault-tolerant stack, support for VRRP, BFD, EAA - Equipment: at least 1 SFP 1Gbit / s Ethernet module for communication over single-mode optical fiber at distances up to 10 km, a set of mounts for installation in a standard 19" rack.	
61.	**Core switch** based on: 1 piece to the ICT and cybersecurity laboratory	Configuration: ‣ at least 2 slots for installing switching modules ‣ at least 2 QSFP 40Gbps Ethernet ports ‣ at least 1 dedicated RJ45 port for management ‣ at least 1 dedicated RJ45 console port ‣ at least 1 USB 2.0 port ‣ at least 2 power supplies ‣ at least 2 ventilation units. Productivity: ‣ Switching matrices - at least 1000 million packets per second. ‣ capacity –not less than 1440 GB/s ‣ the size of the routing table is at least 128,000 entries (IPv4), 64,000 entries (IPv6) ‣ MAC address table size-at least 288,000 entries (IPv4) ‣ IPv6 support Routing protocols: ‣ Static IPv4 and IPv6, OSPF v2, OSPF v3, BFD, RIP/RIPv2/RIPng, BGP, BGP-4, BGP+,IS-IS, MPLS ‣ Policy-based routing, IPv6 tunneling, Switching protocols: ‣ STP (IEEE 802.1D), Rapid STP (RSTP, IEEE 802.1w), Multiple STP(MSTP, IEEE 802.1s), ‣ IEEE 802.3ad Link Aggregation, IGMP, IGMP Snooping, DHCP, DHCP Snooping, ARP, Jumbo frame, Port security ‣ DCB, DCBx, ETS, ECN, FCoE, QoS, PFC, Packet filtering ‣ VXLAN, MAC-based VLAN, LLDP-MED ‣ Number of VLAN is at least 4096 Manageability: ‣ RMON, SNMPv1/v2c/v3, NTP, SNTP, FTP, Telnet, SSH. ‣ Full console (CLI) ‣ Out-of-band interface ‣ Ability to save multiple configurations on the flash. Dual Flash Images ‣ RADIUS and TACACS+ authentication. ‣ Open Flow or Flow support Fault-tolerance: ‣ ability to combine up to 9 devices in a fault-tolerant stack, ‣ support VRRP, BFD, DLDP, Graceful restart for OSPF, BGB, ISIS. ‣ Updating the software without interrupting the service Completeness: ‣ Height not more than 1U ‣ availability of a set of mounts for installation in a standard 19 " rack, ‣ at least 2 switching modules with a total is at least 48 SFP+	**1 (**one**)**

№	Particulars	Configuration	Units needed
		1/10Gbit/s Ethernet ports And at least 4 QSFP 40gbit/s Ethernet ports ‣ availability is at least 2 QSFP+ (DAC) cables for communication between core switches, ‣ Availability of 2 power supply units and 2 hot-swap ventilation units. Warranty ‣ Warranty for at least 3 years.	
62.	**Server rack** based on: 2 pieces per server room	*Rack parameters:* ‣ height not less than 42U, width not less than 600mm, depth not less than 1000mm; ‣ lockable front and rear doors with at least 80% perforation (on the front door), evenly distributed over the entire height for optimal flow of cooling air; ‣ lockable side panels; *Completeness:* ‣ availability of a grounding kit; ‣ availability of a rack stabilization kit; ‣ availability is at least one set of mounting brackets for the rack; ‣ possibility of static installation and wheels for moving the rack in a room with a load of up to 1000 kg; ‣ at least 2 power distribution modules with 12x13.	**2 (**two**)**
63.	**Uninterruptible power supply** based on: 6 pcs per server room	*Form-factor:* ‣ installing the EIA-310D standard in the 19 inch server Cabinet; *Parameters:* ‣ Online UPS with at least 3KW power requirement; ‣ Nominal input voltage - 230 V ‣ Input voltage range: 165-290V; ‣ Supported equipment power: at least 2.5 KW ‣ Input connector-IEC C20 ‣ number of IEC C19 outputs at least 1, number of C13 outputs at least 8 or provision of external PDU based UPS to meet the requirement; ‣ Battery type-valve-controlled, leak-proof, lead-acid; ‣ Hot-swappable batteries; ‣ Up to 4 additional battery modules can be connected; ‣ At least 8 minutes of operation at 50% load ‣ Availability of the network management module (RJ45 Ethernet interface) using SNMP, WEB, or vendor management SOFTWARE; *Warranty* ‣ Warranty is at least 12 months.	**6** (six)
64.	**Touch vertical information kiosk** based on: 2 pcs per ICT CLC corridors	‣ Main technical characteristics ‣ Diagonal of 55” inches ‣ Full HD resolution up to 1920 x 1080 pixel ‣ Intel Core i3 CPU ‣ Hard disk at least 128 Gb SSD ‣ DDR 3 RAM at least 8 Gb ‣ Contrast 1100:1 ‣ Brightness 400 cd/m^2 ‣ 16:9 aspect ratio	**2 (**two**)**

№	Particulars	Configuration	Units needed
		‣ Number of touches 10 touch ‣ Response time 8 ms ‣ Gigabit Ethernet LAN interface ‣ Windows 10 operating system ‣ Metal body ‣ Tempered glass ‣ Warranty for at least 1 year after commissioning	
65.	Installation, delivery, commissioning, testing, Cable lying and fitting Labour	Required for network establishment and software installation and testing for all devices - Skilled job	Calculate as per the list of devices
It is necessary to provide the necessary number of cables, connectors, adapters, converters and other connecting materials for the project implementation.			

Section: 2 (Transportation Cost)

Cost of transportation of Equipment:

From …… To: ……. Cost: ……

From …… To: ……. Cost: ……

From …… To: ……. Cost: ……

From: Cargo Terminal To: Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan Premises Cost: ……

Section: 3 (Statutory Cost)

As per international tax structure:

a. Excise duty at : ……
b. Export duty at : ……
c. Custom duty at : ……

END OF SECTION V

Annexure – I

(On company Letter Head & to be signed by MD/ CEO/ Proprietor)

Date:

To

Embassy of India
Tashkent, Uzbekistan

Dear Sir,

Subject: **Authorization to sign the bid document**

This has a reference to your tender no. ..... dated ..... for setting up of Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan.

It is hereby confirmed that, Mr/ Ms .....working as …….... is entitled to act on behalf of our corporation/company/ firm/organization and empowered to sign this document as well as such other documents, which may be required in this connection.
The specimen signature of Mr/ Ms.……. is as given below.

(Signature 1) (Signature 2)

I, ..., certify that I am <designation> of <company>, and that Mr/ Ms..... whose specimen signatures are given above is authorized to bind the corporation by authority of its governing body.

For M/s _____ (Name of the bidder)

Signature & company seal

Name
Designation
Email
Mobile No.

Annexure – II

(On company Letter Head)

Date:

To

Embassy of India
Tashkent, Uzbekistan

Dear Sir,

Subject: **Bid Form**

This has a reference to your tender no. ..... dated ..... for setting up of Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan.

1. Having examined the 'Invitation for Bids', 'Instructions to Bidders' 'Special Conditions of Contract', 'Technical Compliance Document', 'Schedule of Requirements' and the Annexure for the above referred tender, we the undersigned offer to supply, install & commission and guarantee the whole of the said 'Scope of Work' in conformity with the said Special Conditions of Contract and Technical Specifications for the sum mentioned in Commercial Bid submitted separately, or such other sum as may be ascertained in accordance with the conditions. The details of the items/ services for which we have submitted our Technical Bid and for which we have quoted the rates in our Financial Bid are given in required formats.
2. We have independently considered each and every clause of this tender document and given our informed consent to them.
3. We undertake, if our Bid is accepted, we shall commence the supply of items/ services/ manpower as per delivery schedule offered by us so as to fulfil our obligations as per this Tender Document to full satisfaction of purchaser.
4. If our Bid is accepted we will furnish a **Bank Guarantee** of **03%** order value with a validity of **36 months** to cover delivery, installation & warranty period for the IT Infrastructure.
5. We have independently considered the amount shown in 'Special Conditions of Contract' as per-estimated liquidated damages and agree that they represent a fair estimate of the damages likely to be suffered by you in the event of the work not being completed in time.
6. We agree to abide by this Bid for a minimum period of **180 days** from the date of opening and it shall be remain binding upon us and may be accepted at any time before the expiration of that period or any extended period mutually agreed to.
7. This bid, together with any further clarification/ confirmation given by us and your written acceptance thereof, shall constitute a binding contract between us.

8. We understand that you are not bound to accept the lowest or any offer you may receive against this bid.

9. If our Bid is accepted, we understand that we are to be held solely responsible for the due performance of the Contract.

10. All enclosures and relevant documents forming a part of the proposal are complete and attached herewith duly verified by officials authorized to do the same. All documents submitted are genuine and if Embassy of India, Tashkent finds that we have submitted any forged document, the Embassy may reject our bid; forfeit the PBG and take stringent action against us as per Government of India guidelines including suspension for a period of three years.

11. We accept that all doubts, concerns or ambiguity in the tender document (if any) would be uploaded by us on CPP Portal before the pre-bid meeting. If we raise any doubt, concerns, ambiguity issues, interpretation issues, after the Pre-Bid meeting, Embassy of India, Tashkent may not consider the request or reply.

12. We will accept Embassy of India, Tashkent internal technical and financial evaluation procedure and will not interfere in the process after submission of the bid. We shall not deviate from the bid process and not try to stall the process; if do so, Embassy of India, Tashkent may take stringent action against us.

13. We undertake that our company is not under the declaration of ineligibility for corrupt & fraudulent practices. We also undertake that our company has not been blacklisted by any Government entity in India/ abroad till today.

14. We will follow all guideline mentioned in the tender documents.

For M/s _____ (Name of the bidder)

Signature & company seal

Name
Designation
Email
Mobile No.

Annexure – III

(On company Letter Head)

Date:

To
Embassy of India
Tashkent, Uzbekistan

Dear Sir,

Subject: **Declaration Letter**

This has a reference to your tender no. ..... dated ..... for setting up of Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan.

We confirm that the IT Infrastructure that shall be supplied for Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan will not be refurbished/ duplicate or acquired illegally in India/ third country. We undertake, if our bid is accepted, we will submit a letter from OEM endorsing that the equipment are brand-new at the time of supply and before the issuance of FDCC.

The details of all the OEMs, make & model with detail technical specifications is offered in our technical bid for items viz. Server, Desktop, Laptop, Printer, Scanner, Projector, Interactive White Board, Video Conferencing, UPS and Networking Items etc. If Embassy of India, Tashkent find that any information/ details submitted by us is incorrect, Embassy of India, Tashkent may black list us and forfeit the Embassy of India, Tashkent take stringent action against us as per Government of India guidelines.

By signing this declaration letter we accept all terms and conditions specified in the tender document and agree that Embassy of India, Tashkent's decision will be final and binding on us.

For M/s _____ (Name of the bidder)

Signature & company seal

Name
Designation
Email
Mobile No.

Annexure – IV

(On company Letter Head)

Date:…….. Tender No.:…….

To

Embassy of India
Tashkent, Uzbekistan

Dear Sir,

Sub: **Undertaking to the effect that onsite support during the warranty at Tashkent in Uzbekistan will be provided by <*Company Name*> through its own Branch Office/ Service Centre/ Local Partner**

This has a reference to your tender no. ..... dated ..... for setting up of Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan.

We undertake to provide the onsite support at Tashkent in Uzbekistan during the period of warranty through our own Branch Office/ Service Centre/ local partner. In case <*Company Name*> is a successful bidder, details viz. Name, Address, Contact Person, Telephone/ Fax, Email etc. of our own Branch Office/ Service Centre/ local partner along with an undertaking from the local dealer/ service provider (if applicable) will be submitted by <Company Name> within 30 (thirty) days of the receipt of Supply Order from Embassy of India, Tashkent.

Thanking you,

Sincerely yours,

For M/s _____ (Name of the bidder)

Signature & company seal

Name
Designation
Email
Mobile No.

Annexure – V

BID SECURING DECLARATION FORM

Tender No : _____ Dated: _____

To

Embassy of India
16 Kara-Bulak Street, Mirzo Ulugbek District
Tashkent, 100052, Uzbekistan

I/We, on behalf of M/s _____ the undersigned, declare that :

I/We understand that, according to your conditions, bids must be supported by a Bid Securing Declaration.

I/We accept that I/We may be disqualified from bidding for any contract with Government of India for a period of three years from the date of notification if I am /We are in a breach of any obligation under the bid conditions, because I/We

a) have withdrawn/modified/amended, impairs or derogates from the tender, my/our Bid during the period of bid validity specified in the form of Bid; or

b) having been notified of the acceptance of our Bid by the purchaser during the period of bid validity (i) fail or refuse to execute the contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We understand this Bid Securing Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder, or (ii) thirty days after the expiration of the validity of my/our Bid.

Signature with stamp
(signature of person whose name and capacity are shown)
In the capacity of (legal capacity of person signing the Bid Securing Declaration)

Name :_____

Dated on _____ day of _____(date of signing)

PROFORMA FOR BANK GUARANTEE TOWARDS PERFORMANCE GUARANTEE (on non-judicial paper of appropriate value)

Dated:

To

Embassy of India, Tashkent **BANKS GUARANTEE NO:**

Dear Sir(s),

This has reference to the Supply Order No. _____ dated _____ placed by Embassy of India, Tashkent on M/s …….for supply, installation, commissioning and warranty of IT Hardware & Software for setting up of Information Technology Laboratory at Uzbekistan Armed Forces Academy, at Tashkent, Uzbekistan.

The conditions of this order provide that the vendor shall,

1. Arrange to deliver the items listed in the said order to the consignee, as per details given in said order, and
2. Arrange to install and commission the items listed in said order at client's site, to the entire satisfaction of Embassy of India, Tashkent and
3. Arrange for the comprehensive warranty service support towards the items supplied by vendor on site in Uzbekistan as per the warranty clause in said purchase order.

M/s _____ has accepted the said purchase order with the terms and conditions stipulated therein and have agreed to issue the performance bank guarantee on their part, towards promises and assurance of their contractual obligations vide the Supply Order No. _____ on M/s. _____ holds an account with us and has approached us and at their request and in consideration of the promises, we hereby furnish such guarantees as mentioned hereinafter.

Embassy of India, Tashkent shall be at liberty without reference to the Bank and without affecting the full liability of the Bank hereunder to take any other undertaking of security in respect of the suppliers obligations and / or liabilities under or in connection with the said contract or to vary the terms vis-a-vis the supplier or the said contract or to grant time and or indulgence to the supplier or to reduce or to increase or otherwise vary the prices or the total contract value or to forebear from enforcement of all or any of the obligations of the supplier under the said contract and/or the remedies of Embassy of India, Tashkent under any security (i.e) now, or hereafter held by Embassy of India, Tashkent and no such dealing(s) with the supplier or release or forbearance whatsoever shall have the effect of releasing the bank from its full liability of Embassy of India, Tashkent hereunder or of prejudicing right of Embassy of India, Tashkent against the bank.

This undertaking guarantee shall be a continuing undertaking guarantee and shall remain valid and

irrevocable for all claims of Embassy of India, Tashkent and liabilities of the supplier arising up to and until _____.

This undertaking guarantee shall be in addition to any other undertaking or guarantee or security whatsoever the that Embassy of India, Tashkent may now or at any time have in relation to its claims or the supplier's obligations/liabilities under and/ or in connection with the said contract and Embassy of India, Tashkent shall have the full authority to take recourse to or enforce this undertaking guarantee in preference to the other undertaking or security (ies) at its sole discretion and no failure on the part of Embassy of India, Tashkent in enforcing or requiring enforcement of any other undertaking or security shall have the effect of releasing the bank from its full liability hereunder.

We _____ hereby agree and irrevocably undertake and promise that if in your (Embassy of India, Tashkent's) opinion any default is made by M/s _____ in performing any of the terms and/or conditions of the agreement or if in your opinion they commit any breach of the contract or there is any demand by you against M/s _____, then on notice to us by you, we shall on demand and without demur and without reference to M/s _____, pay you, in any manner in which you may direct, the amount of INR _____/- (INR _____ Only) or such portion thereof as may be demanded by you not exceeding the said sum and as you may from time to time require. Our liability to pay is not dependent or conditional on your proceeding against M/s _____ and we shall be liable & obligated to pay the aforesaid amount as and when demanded by you merely on an intimation being given by you and even before any legal proceedings, if any, are taken against M/s _____.

The Bank hereby waives all rights at any time inconsistent with the terms of this undertaking guarantee and the obligations of the bank in terms hereof shall not be anywise affected or suspended by reason of any dispute or disputes having been raised by the supplier (whether or not pending before any arbitrator, Tribunal or Court) or any denial of liability by the supplier or any order or any order or communication whatsoever by the supplier stopping or preventing or purporting to stop or prevent payment by the Bank to Embassy of India, Tashkent hereunder.

The amount stated in any notice of demand addressed by Embassy of India, Tashkent to the Bank as claimed by Embassy of India, Tashkent from the supplier or as suffered or incurred by Embassy of India, Tashkent on the account of any losses or damages or costs, charges and/or expenses shall as between the Bank and EDII be conclusive of the amount so claimed or liable to be paid to Embassy of India, Tashkent or suffered or incurred by Embassy of India, Tashkent, as the case may be and payable by the Bank to Embassy of India, Tashkent in terms hereof.

You (Embassy of India, Tashkent's) shall full liberty without reference to us and without affecting this guarantee, postpone for any time or from time to time the exercise of any of the powers and rights conferred on you under the contact with the said M/s _____ and to enforce or to forbear from endorsing any power or rights or by reason of time being given to the said M/s _____ which under law relating to the sureties would but for the provisions have the effect of releasing us.

You will have full liberty without reference to us and without affecting this guarantee, postpone for any time or from time to time the exercise of any of the powers and rights conferred on you under the contract with the said M/s _____ and to enforce or to forbear from endorsing any power or rights or by reason of time being given to the said M/s. _____ which under law relating to the sureties would but for the provisions have the effect of releasing us.

Your right to recover the said sum of INR _____ (INR _____ only) from us in manner aforesaid will not be affected/or suspended by reason of the fact that any dispute or disputes have been raised the said M/s _____ and/ or that any dispute or disputes are pending before any officer, tribunal or court or Arbitrator.

The guarantee herein contained shall not be determined or affected by the liquidation or winding up, dissolution or change of constitution or insolvency of the said M/s. _____ but shall in all respects and for all purposes be binding and operative until payment of all dues to Embassy of India, Tashkent in respect of such liability or liabilities.

Our liability under this guarantee is restricted to INR_____ (INR_____Only). Our guarantee shall remain in force until unless a suit action to enforce a claim under guarantee is filed against us within three months from (which is date of expiry of guarantee) all your rights under the said guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there under.

We have power to issue this guarantee in your favour under Memorandum and Articles of Association of our Bank and the undersigned has full power to do under the power of Attorney dated.

Notwithstanding anything contained herein:

A. Our liability under this guarantee shall not exceed INR _____ (in words)

B. This bank guarantee shall be valid up to _____ & unless a suit for action to enforce a claim under guarantee is filed against us within three months from the date of expiry of guarantee. All your rights under the said guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there after i.e. after three months from the date of expiry of this Bank guarantee

C. We are liable to pay the guaranteed amount or any parts thereof under this bank guarantee only and only if you serve upon us a written claim or demand on or before _____

D. The Bank guarantee will expire on _____ granted by the Bank

Yours faithfully,

For (Name of Bank)

SEAL OF THE BANK

Authorised Signatory

Annexure – VII

(On company Letter Head)

CHECK LIST

Sr. No.	Item Description	Details	Attached (Yes/No)
1	Name and Address of the Company/ Firm and its incorporation details		
2	Tender Fee Details. **Demand Draft** for **INR 2000/-** drawn on any **Nationalized/ Scheduled Bank**, in favour of **'**Embassy of India, Tashkent payable at New Delhi.		
3	**Bid Security Declaration**.		
4	Duly filled Technical Bid with proper seal and signature of authorized person on each page of the Bid submitted. Certificate of authority should be scanned and submitted as per format given at ***Annexure I***.		
5.	Copy of Supply Orders for / Contracts/ Agreements for similar work, executed by the bidders in last 5 (five) years ending March 31, 2022 along with the completion certificate duly issued by the end user. Copy of the purchase order and work completion report duly notarized along with contact details of the end user. The bidder should have completed at least **ONE** similar work not less than **INR 30 Million** OR **TWO** similar works not less than **INR 15 Million** each OR **THREE** similar works not less than **INR 10 Million** each		

6.	GST/ RC etc. Details		
7.	Last three financial years annual turn over details. The bidder should have Average annual turnover of minimum **INR 45 Million** in last **3 (three) financial years** ending **31st March 2022**		
8.	Partnership Deed / Articles of Memorandum of Association		
9.	Bid Form by the bidder as per format		
10.	Technical Compliance Document in the form of **Tech_Comp_Doc.pdf** With detailed technical specification, make, model and cross reference compliance with the data sheets or OEM Compliance		
11.	Declaration by the bidder as per format given at ***Annexure III***		
12.	Undertaking to the effect that the bidders have its own Branch Office/ Service Centre at Tashkent in Uzbekistan or arrangement to provide onsite support through local dealer/ service provider as per format given at ***Annexure IV***		

Thanking you,

Sincerely yours,

For M/s _____ (Name of the bidder)

Signature & company seal

Name
Designation
Email
Mobile No.

Annexure – VIII

SCHEDULE OF REQUIREMENT (Bill of Material)

№	Particulars	Configuration	Units needed
1.	**Videoconferencing terminal VKS type 1 (with 3 rotary cameras each),** based on: 2K-TA. in large lecture classes.	**Composition of the VCS video communication terminal set:** - Codec - Camera rotatable 3 pcs. - Set of 2 wireless microphones - Devices for wireless content transfer - License for subscribers. **Requirements for technical and functional characteristics of the video conferencing terminal (codec):** - implementation of compression/decompression procedures for audio and video streams at the hardware level; - organization of communication by means of an IP network using H. 323 and SIP protocols; - availability of a radio remote control; - availability is at least one network interface of the 10/100/1000 Base-T type; - support for working with a video stream in quality not worse than Full HD 1080 60p; - support for 1080 30p content transfer; - ability to wirelessly receive content from the lecturer; - the ability to connect at least nine cameras with support for control from the terminal, the standard remote control; - ability to connect two microphones; - ability to connect wireless microphones; - support for H. 264 High profile, H. 263, H. 265 HVEC video encoding algorithms; - support for opus, AEC, G. 722, and G. 711 audio encoding algorithms; - availability of the integrated video outputs: - availability of the integrated video inputs: - at least one HDMI; - Line audio input type RCA; - Availability of RCA line audio output; - At least 3 USB ports; - Transfer audio to the display device via HDMI; - support for the Russian-language interface for managing the video conferencing terminal; - Support for remote hardware software updates. - Support for packet loss prevention technology (anti-packet loss technology) - Ability to record a conference on a USB stick -Support for at least 8 cameras with one codec **Requirements for technical and functional characteristics of a video camera complete with a video communication terminal (codec):**	**2** (two)

№	Particulars	Configuration	Units needed
		- hardware support for working with video with a quality is at least Full HD 1920 x 1080 60p, at least 2 MP; - frame rate is at least 50 fps; - availability of automatic exposure control; - availability of auto focus; - presence of noise reduction mode; - support for video conferencing terminal management; - at least 12x optical zoom; - horizontal viewing angle is at least 70°; - vertical viewing angle is at least 42°; - video output-HDMI; - availability of an RJ-45 output for connecting to the codec and transmitting the video stream over Ethernet; - presence of the RJ-45 camera control interface; - availability of an RS-232/Equivalent camera control interface; **Requirements for technical and functional characteristics of a wireless circular microphone:** The package must include at least 2 circular pattern microphones, an adapter for connecting to the codec, and a charging station for them; - sound capture radius is at least 3 Metres - on button./ microphone off; - Support for the DECT standard (1880-1900Hz) -- Battery capacity is at least 800mAh **Requirements for technical and functional characteristics of a wireless content transmission device complete with a video communication terminal (codec):** - Source and receiver of the signal in the composition; - Video transmission in a resolution is at least 1080p; - Delay no more than 120ms; - USB interface; Warranty for the set is at least 12 months.	
2.	**Videoconferencing terminal VKS type 2,** based on: 5 pcs. in the laboratory, 1 PC. in the laboratory room	**Requirements for technical and functional characteristics of the videoconferencing terminal:** - implementation of compression/decompression procedures for audio and video streams at the hardware level; - organization of communication by means of an IP network using H. 323 and SIP protocols; - availability of a radio remote control; - availability is at least one network interface of the 10/100/1000 Base-T type; - support for working with a video stream in quality not worse than Full HD 1080 60p; - support for 1080 30p content transfer; - ability to wirelessly receive content from the lecturer; - the ability to connect at least nine cameras with support for control from the terminal, the standard remote control; - ability to connect two microphones; - ability to connect wireless microphones; - support for H. 264 High profile, H. 263, H. 265 HVEC video encoding algorithms; - support for content transfer protocols	**6** (six)

№	Particulars	Configuration	Units needed
		- support for opus, AEC, G. 722, and G. 711 audio encoding algorithms; - availability of the integrated video outputs: - availability of the integrated video inputs: - at least one HDMI; - Presence of a 3.5 mm linear audio input; - 3.5 mm linear audio output; - At least 3 USB ports; - Transfer audio to the display device via HDMI; - support for the Russian-language interface for managing the video conferencing terminal; - Support for remote hardware software updates. - Support for creating two independent conferences at the same time - Support for packet loss prevention technology (anti-packet loss technology) - Availability of a built-in camera - Support for at least 8 cameras with one codec - Ability to record a conference on a USB drive **Requirements for technical and functional characteristics of the built-in video camera of the video communication terminal (codec):** - hardware support for working with video with a quality is at least Full HD 1920 x 1080 60p, at least 2 MP; - frame rate is at least 50 fps; - availability of automatic exposure control; - availability of auto focus; - presence of noise reduction mode; - support for video conferencing terminal management; - at least 12x optical zoom; - horizontal viewing angle is at least 70°; - vertical viewing angle is at least 42°; - video output-HDMI; - availability of an RJ-45 output for connecting to the codec and transmitting the video stream over Ethernet; - presence of the RJ-45 camera control interface; - availability of an RS-232/ Equivalent camera control interface; **Requirements for technical and functional characteristics of a wireless circular microphone:** The package must include at least 2 circular pattern microphones, an adapter for connecting to the codec, and a charging station for them; - sound capture radius is at least 3 Metres - on button./ microphone off; - Support for the DECT standard (1880-1900hz) - Battery capacity is at least 800mAh - Warranty is at least 1 year. **Requirements for technical and functional characteristics of a wireless content transmission device complete with a video communication terminal (codec):** - Source and receiver of the signal in the composition; - Video transmission in a resolution is at least 1080p;	

№	Particulars	Configuration	Units needed
		- Delay no more than 120ms; - USB interface; Warranty for the set is at least 12 months.	
3.	**Interactive touch screen-65",** based on: 4 pieces in large lecture classes, 11 pcs. in the laboratory, 1 pc. in the laboratory room	**Requirements for technical and functional characteristics** - Image format-16:9; - Display diagonal-65" (165 cm); - Screen resolution- at least 1920*1080; - Contrast Ratio - 4000 : 1; - Number of touches – 10 simultaneous (finger, pen, or any other opaque objects); - Number of users-10; - Input connectors-Digital TV Tuner, HDMI*2 Input, VGA Input, audio Input, 3.5 mini Jack, USB 3.0*2; - Output connectors-VGA Output, audio Output, 3.5 mini Jack; - Audio output - 2 x 10 Watt; - Audio output - 2 x 10 Watt; - Processor- Intel Core i3 4130 or higher; - RAM – 4 GB DDR3 1600; - Installed HDD capacity-HDD 500GB SATAIII 5400 rpm; - Network - 10/100 Mbit/s Realtek; - A set of fasteners for installation on drywall surfaces; - Warranty is at least 12 months.	**16** (sixteen)
4.	**Mobile interactive tribune** based on: 2 pcs. in large lecture classes	**Requirements for technical and functional characteristics of the interactive stand:** - Metal case material - Interactive screen 22"; - Gooseneck microphone + wireless microphone (manual and lapel); - Integrated multimedia player(with amplifier); - PKS-7000C control controller (with amplifier) + 7" LCD touchpad+ laptop input (HDMI) - Input interfaces: VGA, HDMI x2, RJ45, USB x4, Power Socket - 150W x 2 / 8Ω amplifier (300W) - Speaker 60 W (2EA) - Warranty is at least 12 months.	**2** (two)
5.	**Color MFP A4 size** based on: 2 pcs. in large lecture classes	**Requirements for technical and functional characteristics:** ‣ Device type-printer / scanner/copier; Printer: - Printing technology-laser printing; - Print type-color; - Paper size-A4; - Support for automatic two-sided printing; - Max. print speed A4 b / W-one-sided at least 25 pages / min; - Print resolution-600 x 600 dpi, 1200 x 1200 dpi; - Support-UFRII, PCL6; - Print JPEG/TIFF/PDF files from USB media; Scanner: - Type-color - Paper size-A4; - Form factor-tablet, two-way automatic document feeder; - Scanning resolution-optical 600 x 600 dpi; - ADF scanning speed: one-way at least 55 images./min (300dpi)	**2** (two)

№	Particulars	Configuration	Units needed
		and 30 images./min (600dpi), two-way at least 27 images./min (300dpi) and 15 images./min (600dpi); - TWAIN and WIA support; - Support sending files by mail, to PC, to USB storage, to SMB / FTP server-JPEG/TIFF/PDF; Copier: - Paper size-A4; - One-way copy speed: A4 b / W-at least 25 pages / min; - Copy resolution-600 x 600 dpi; General: - Paper feed-manual / automatic, one-way/two-way; - The volume of the feed tray is at least 500 sheets; - The volume of the feed tray is at least 100 sheets in the universal tray; - The volume of the output tray – 250 sheets; - Paper type – thin, plain, secondary, color, pre-perforated, thick, fabric, transparent film, labels, envelopes, tracing paper; - Paper density-standard tray from 55 to 220 g / m2; - Memory capacity-at least 2GB; - Control panel – color LCD touch screen; - Connection interface-USB 2.0, USB3. 0, 10/100 /1000 Ethernet RJ-45; - Power supply 220-240 V, 50/60 Hz; - OS support – Windows 10/8. 1/7, Mac OS X, Linux; - Warranty is at least 12 months	
6.	**A4 color inkjet printer** based on: 6 pcs per lab	**Requirements for technical and functional characteristics:** ‣ Device type – printer Printer: - Printing technology-inkjet printing; - Print type-color; - Paper size-A4; - Support for automatic two-sided printing; - Max. print speed A4 b / W-one-sided at least 14.5 pages / min; color – 10.4 pages / min - Print resolution-Up to 9600 x 2400 dpi Support-UFRII, PCL6; - Print JPEG/TIFF/PDF files from USB media; General: - Paper feed-manual / automatic, one-way/two-way; - The volume of the feed tray is at least 500 sheets; - The volume of the feed tray is at least 100 sheets in the universal tray; - The volume of the output tray – 250 sheets; - Paper type – thin, plain, secondary, color, pre-perforated, thick, fabric, transparent film, labels, envelopes, tracing paper; - Paper density-standard tray from 55 to 220 g / m^2; - Memory capacity-at least 2GB; - Control panel – color LCD touch screen; - Connection interface-USB 2.0, USB3. 0, 10/100 /1000 Ethernet RJ-45; - Power supply 220-240 V, 50/60 Hz; - OS support – Windows 10/8. 1/7, Mac OS X, Linux; - Warranty is at least 12 months	**6** (six)

№	Particulars	Configuration	Units needed
7.	**Personal computer with two monitors completed with**: 34 pcs. in the laboratory for web and object-oriented programming, 26 pcs.in the laboratory for cybersecurity and hardware programming.	**PC features:** - Quantity – 1 PC. - Form factor: Tower - Number of processor cores at least-8; - Processor base clock frequency not less than-not less than 3.1 GHz with the maximum frequency in overclocking mode not less than 4.9 GHz; - Processor cache memory not less than-not less than 16MB; - Compatibility with both 64-bit and 32-bit applications at the hardware level; - The amount of RAM not less than 32GB DDR4 2666; - Ability to expand RAM up to 128GB; - Ability to install memory with ECC support; - At least 4 slots for installing memory modules; - At least 4 SATA interfaces for connecting hard drives and solid-state drives; - Solid-state drive (SSD) not less than 256GB; - Hard disk with at least 2TB SATA 7200RPM; - Hard disk controller with support for RAID levels is at least 0/1; -DVD-RW optical drive; - Video card: discrete, processor frequency not less than 1700MHz, memory capacity not less than 8GB, memory type-GDDR6, memory bus bit not less than 256 bit, at least 3 DisplayPort ports, at least 1 HDMI port, cooling system type-active; - Network interface: at least 1 x RJ-45 Ethernet with 100/1000Mbps; - I/o interfaces: at least 6 USB 3.0 ports, at least 2 USB2.0 ports, at least 1 universal audio port, at least 2 audio outputs/inputs, at least 2 DisplayPort ports; - At least 1 PCIe Gen3 x16 slot, at least 1 PCIe Gen3 x4 slot, at least 2 PCIe G3 x1 slots, at least 2 M. 2 slots for SSD installation (PCIe Gen3 x4); - Power supply with a power is at least 650W and an efficiency is at least 90% with active power factor correction; - Russian Keyboard and mouse with scroll wheel; - Warranty is at least 3 years without returning the drives when the warranty is replaced **Monitor Feature:** - Quantity – not less than 2 units with bracket mount to the table - Panel type-IPS with led backlight; - monitor diagonal is at least 23.8” with an aspect ratio of 16: 9; - anti-glare coating; - native resolution is at least 1920x1080 @ 60 Hz; - number of displayed colors: at least 16.7 million; - brightness is at least 250 cd/m^2; - contrast ratio is at least 1000:1; - response time no more than 5ms; - ports – 1xdisplay Port; 1xVGA, 1xHDMI; - at least 2 USB 3.0 ports; - viewing angles is at least 178 horizontally and vertically; - support for VESA mounting 100mm;	**60** (sixty)

№	Particulars	Configuration	Units needed
		- stand with the ability to adjust the angle of the monitor, adjust the height is at least 100mm, with the ability to rotate in the horizontal and vertical plane; - bracket for installing two displays simultaneously on VESA 100mm mounts from 19 to 27 inches with the ability to adjust the height to 120mm, adjust the tilt angles from -5 to 24 degrees, rotate the monitors in portrait orientation; -Licensed Windows 10 operating system - Warranty is at least 3 years	
8.	**Enhanced personal computer (graph station) with two monitors completed with:** 5 pcs. in the laboratory for 3D modeling and creation of virtual reality software, 3 pcs. in the multimedia laboratory	**PC features:** - Quantity – 1 PC. - Form factor: Tower - Number of processor cores at least-8; - The base clock frequency of the processor is not less than-not less than 3.6 GHz with a maximum frequency in overclocking mode of not less than 4.9 GHz; - Processor cache memory not less than-not less than 16MB; - Compatibility with both 64-bit and 32-bit applications at the hardware level; - The amount of RAM not less than 64GB DDR4 2666; - Ability to expand RAM up to 128GB; - Ability to install memory with ECC support; - At least 4 slots for installing memory modules; - At least 4 SATA interfaces for connecting hard drives and solid-state drives; - A solid-state drive (SSD) is at least 512 GB; - Hard disk at least 4TB SATA 7200RPM; - Hard disk controller with support for RAID levels is at least 0/1; -DVD-RW optical drive; - Video card: discrete, processor frequency not less than 1700MHz, memory capacity not less than 8GB, memory type-GDDR6, memory bus width not less than 256 bit, at least 3 DisplayPort ports, at least 1 HDMI port, cooling system type-active; - Network interface: at least 1 x RJ-45 Ethernet with 100/1000Mbps; - I/o interfaces: at least 6 USB 3.0 ports, at least 2 USB2.0 ports, at least 1 universal audio port, at least 2 audio outputs/inputs, at least 2 DisplayPort ports; - At least 1 PCIe Gen3 x16 slot, at least 1 PCIe Gen3 x4 slot, at least 2 PCIe G3 x1 slots, at least 2 M. 2 slots for SSD installation (PCIe Gen3 x4); - Power supply with a power is at least 650W and an efficiency is at least 90% with active power factor correction; - Russian Keyboard and mouse with scroll wheel; - Warranty is at least 3 years without returning the drives when the warranty is replaced **Monitor features:** - Quantity – not less than 2 units with bracket mount to the table - Panel type-IPS with led backlight; - monitor diagonal is at least 23.8” with an aspect ratio of 16: 9; - anti-glare coating;	**8** (eight)

№	Particulars	Configuration	Units needed
		- native resolution is at least 1920x1080 @ 60 Hz; - number of displayed colors: at least 16.7 million; - brightness is at least 250 cd/m^2; - contrast ratio is at least 1000:1; - response time no more than 5ms; - ports – 1xdisplay Port; 1xVGA, 1xHDMI; - at least 2 USB3.0 ports - viewing angles is at least 178 horizontally and vertically; - support for VESA mounting 100mm; - stand with the ability to adjust the angle of the monitor, adjust the height is at least 100mm, with the ability to rotate in the horizontal and vertical plane; - bracket for installing two displays simultaneously on VESA 100mm mounts from 19 to 27 inches with the ability to adjust the height to 120mm, adjust the tilt angles from -5 to 24 degrees, rotate the monitors in portrait orientation; - Licensed Windows 10 operating system - Warranty is at least 3 years	
9.	**Laptop** based on**:** 2 pcs. in large lecture classes, 6 pcs. in the laboratory.	*Processor:* -microprocessor with an x64 architecture focused on multithreaded computing, with at least 4 cores and a base clock frequency is at least 1.6 GHz and in overclocking mode is at least 3.4 GHz with a level 3 cache is at least 6MB. You must be able to work with 64-bit applications on the hardware level; *Memory and storage of information:* - at least 8GB DDR4 2400; - ability to expand the amount of RAM up to 32GB; - Number of slots for installing memory at least 2; - Hard disk capacity is at least 500GB SATA 7200 RPM; *I / O interfaces:* - at least 3 USB3.0 and higher ports; - at least 1 USB2.0 port; - at least 1 HDMI port; - at least 1 RJ45 port of the 1Gbit/s Ethernet network adapter; - at least 1 universal input for connecting the headset; *Display:* - IPS with LED backlight; - monitor diagonal is at least 15.6” with an aspect ratio of 16: 9; - anti-glare coating; - native resolution is at least 1920x1080 @ 60 Hz; - brightness is at least 250 cd/m^2; - contrast ratio is at least 600:1; - the viewing angles are not less than 85 horizontal, 85 vertical. *Other requirements:* - Graphics video adapter with a memory capacity is at least 2GB DDR3 with a memory bus bit depth is at least 64 bits, processor frequency is at least 900MHz, support for DirectX 12, OpenGL 4; - Multi-language keyboard; - Power supply with a capacity is at least 65W; - Licensed Windows 10 operating system - Warranty is at least 3 years, which does not require the return of	**8** (eight)

№	Particulars	Configuration	Units needed
		drives for replacement.	
10.	**Network sockets RJ-45Cat 6** based on: 120 pcs. for the entire ICT CLC	- Category not lower than cat.6 -Type of installation in gathering with a casing -Type of mounting in the spacer and on the screws - Device width 85 mm - Device height 85 mm - Device depth 33.3 mm - Property of the thermoplastics material - Material: plastic - Suitable for IP20 degree of protection (IP) - Number of modules (for modular series) 2	**120 (**one hundred twenty**)**
11.	**UTP Cat 6 cable** based on: 7000 m. for the entire ICT CLC	- 4-pair cable, category 6 - Data transfer rate up to 1000 Mbit / s when using 4 pairs.	**7000 (**seven thousand
12.	**Connectors RJ-45 Cat 6** based on 480 units for the entire ICT CLC	- The connector type is RJ-45 (8P8C) - Cat 6 category - Bandwidth, 250 MHz - Performance of unshielded - Contact material phos photized bronze with a gold coating of 1.25 microns - Housing material: transparent polycarbonate (PC, UL 94V-2) - Supported tool for crimping and connecting - The thickness of the conductors, AWG 23-25 - Storage temperature, t °C -40 ~ +70 - Operating temperature, t °C -30 ~ +80	**480 (**four hundred eighty)
13.	**Patch panels for 48 ports** based on 4 pcs. per server room	- Number of ports 48 - UTP capping and casing - Cat Category. not less than 6E - Constructive 19" - Patch panel type Network RJ-45 - Built-in cable organizer is available - Mounting height 1U	**4 (**four**)**
14.	**HDMI cable 10 m** based on: 15 pcs for the entire ICT CLC	- Interface: HDMI type a / a plug-in; - Support HDMI2.0 4K@60HZ; - Video signal resolution: 480P, 720P, 1080i,1080P, 3D,4K@30Hz,4K@60Hz - Bandwidth: 18.2 Gbps (6Gbps x 3); - Support for HDCP2.2/CEC/EDID/HDR; - Transmission of high-frequency signals via optical fiber, without EMI, without signal loss; - 4.8 mm outer diameter;	**15 (**fifteen**)**
15.	**HDMI cable 20 m** based on: 5 pcs for the entire ICT CLC	- Interface: HDMI type a / a plug-in; - Support HDMI2.0 4K@60HZ; - Video signal resolution: 480P, 720P, 1080i,1080P, 3D,4K@30Hz,4K@60Hz - Bandwidth: 18.2 Gbps (6Gbps x 3); - Support for HDCP2.2/CEC/EDID/HDR; - Transmission of high-frequency signals via optical fiber, without EMI, without signal loss; - 4.8 mm outer diameter;	**5 (**five**)**

№	Particulars	Configuration	Units needed
16.	**HDMI cable 5 m** based on: 5 pcs for the entire ICT CLC	-Interface: HDMI type a / a plug-in; - Support HDMI2.0 4K@60HZ; - Video signal resolution: 480P, 720P, 1080i,1080P, 3D,4K@30Hz,4K@60Hz - Bandwidth: 18.2 Gbps (6Gbps x 3); - Support for HDCP2.2/CEC/EDID/HDR; - Transmission of high-frequency signals via optical fiber, without EMI, without signal loss; - 4.8 mm outer diameter;	**5 (**five**)**
17.	**HDMI splitter (splitter)** based on: 5 pcs. for the entire ICT CLC	- Support HDMI 1.4 b - HDCP 1.2 support - Support Ultra HD (4kx2k) - CEC - Indication of active inputs and outputs - Supported resolution: -480i@60Hz,480p@60Hz,576i@50Hz,576p@50Hz,720p@50/60 Hz, 1080i@50/60Hz,1080p@50/60Hz, 1080p@24Hz 3D,720p@50/60Hz 3D, 4x2k - Color rendering 24bit / dark color 30bit dark color 36bit - Video format: -DTS-HD/Dolby-true HD/LPCM7.1/DTS/Dolby-AC3/DSD - Maximum transfer rate of 10.2 Gbps (340MHz) - Cascading Of 3~4 Layers - HDMI connectors: type A 19-pin female - Operating temperature: +5 - +35°C - Relative humidity: up to 85% - Metal case - Power supply: Input: ~ 220V / Output: +5V - Maximum cable length for input 15 m (for 4K resolution-12 m), for output 25 m (for 4K resolution-15m)	**8 (**eight**)**
18.	**3D scanner** based on: 1 pc. to the laboratory for 3D modeling and creation of virtual reality software	- Weight, less than 2 KGs - OBJ , STL , ASC , PLY , P3 file formats - Ability to capture texture Yes (with color scanning module) - Scan time is less than 1 second. - Depth of field, mm ±100 - Scan area 135x100 mm-225x170 mm - USB 3.0 interface - LED light source - Minimum system requirements video: NVIDIA GTX770 and above; video memory over 4G; CPU: i7 and above; RAM: 16G and above - Volume accuracy 0.3 mm - Working distance 400 mm - Distance to the point 0.2-2 mm - Scanning speed of 20-30 fps, 100,000 dots / s - Scanning accuracy up to 0.05 mm	**1 (**one**)**
19.	**Head-mounted display** based on: 4 pc. to the laboratory for 3D modeling and creation of virtual reality software	Set of**:** -HTC VIVE virtual reality helmet-1pc. -VIVE controllers 2 pcs. -Base stations 2 pcs. -Power cables 1 PC. -Face plates 2 pcs.	**4 (**four**)**

№	Particulars	Configuration	Units needed
		-Nose pad 1 PC. -3-in-1 cable - 1 PC. -Communication module - 1 PC. -Earplugs - 1 PC. -Cables, chargers and accessories (set) - 1 PC. -Specifications: -Display resolution of 1080 x 1200 pixels for each eye (2160 x 1200 pixels for both eyes) -The viewing angle is 110 degree -The corners of the steps of positioning systems 120 degrees -Display diagonal 3.6 inches -Refresh rate of 90 Hz -Wire length 4.5 meters -Steam VR platform -Compatible with PC and Windows OS -Adjusting the lens / focal length -Head –mounted display weight 512 grams -Helmet features Support for 2 HTC base stations -Steam VR Tracking sensors, accelerometer, gyroscope, proximity sensor -Interfaces 1x USB 3.0; 1x HDMI 1.4	
20.	**Virtual platform** based on: 1 pc. to the laboratory for 3D modeling and creation of virtual reality software	Set of**:** -Kat Walk Platform -Module for visual display and management of equipment with the KAT STATION server -Kat FIRE game gun -3 pairs of pads for KAT SHOES -Kat SENSOR Suite for the KAT SPACE platform -Mounting kit with keys, grease, etc. -HTC VIVE - complete set including controllers, helmet, laser trackers and wires -Set of KAT CABLE cables and adapters -Set of 11 different KAT GAMES (upgradable and updated)	**1 (**one**)**
21.	**Video camera:** based on 1 piece per multimedia lab	- 4K camcorder with fixed lens AG-DVX200 - 4/3 type MOS - 12 stages of dynamic range - DCI 4K 24P, UHD 4K up to 60p - Variable frame rate up to 120 FPS in ARV - Recording in MP4 / MOV in 4K - Integrated Leica Lens having f / 2.8 – f / 4.5 lens and at least 13 x zoom - 3 x Separate control ring of the lens - 2 CD card slots (compatible with U3) - HDMI 2.0, 3G - SDI output. - Optical image stabilizer	**1 (**one**)**
22.	**Memory card:** based on 3 pcs. per multimedia lab	- 256GB professional 1000 x UHS-II SDXC SDXC memory card (class 10, UHS speed class 3)	**3 (**three**)**
23.	**On-camera MIC gun** based on: 1 pc for multimedia lab	- Narrow-focus microphone (gun) mounted on the AG-DVX200 Camera	**1 (**one**)**

№	Particulars	Configuration	Units needed
24.	**Battery for the camera** based on: 3pc for multimedia lab	- Battery for the camera 4K camera – VW-VBD58 (7.2 V, 5800mAh)	**3 (**three**)**
25.	**On-camera lamp for 4K camcorder** based on: 1 pc for multimedia lab	- On-camera two-color led camera light for AG-DVX200 4K camcorder -Variable color 3200 to 5600K -Dimming from 100 to 10% -Power consumption-12W -Compatible with SONY L-series batteries -1/4 "-20 threaded hole -D-Tap power cable -Spherical Shoe mounting adapter -Removable doors and filter diffuser	**1 (**one**)**
26.	**Battery for on-camera lamp** based on:2 pc for multimedia lab	-NP-F975 Li-ion battery (7.4V, 7800mAh)	**2 (**two**)**
27.	**Charger for on-camera lamp** based on: 1 pc for multimedia lab	- Compact AC/DC charger for l & M series batteries	**1 (**one**)**
28.	**Camera bag** based on: 1 pc for multimedia lab	- Portable bag for 4K AG-DVX200 camera	**1 (**one**)**
29.	**Tripod for 4K camcorder** based on: 1 pc for multimedia lab	- 509hd head + 545 tripod with lower stretch - Material: aluminum. - Maximum load: up to 13.5 kg - Optimal load: up to 12.8 kg - Maximum height: 172cm - Minimum height: 48cm - Folded length: 84cm - Bridging Technology - Variable resistance when panning - ABR balancing system with indication - 4 balancing options - Extended and extended platform for camera installation - Included: head, tripod, lower stretch, cover.	**1 (**one**)**
30.	**Camera stabilizer** based on: 1 pc for multimedia lab	- Inline function - Operating mode: - Suspension - Inverted - Portable - Built-in independent ins module - DJI stabilizer motors with encoders - Bluetooth module - USB connector - 2.4 GHz receiver - Temperature sensor 32-bit CPU - D-Bus support - Current-static current: 300 mA (at a voltage of 16 V) - Dynamic current: 600 mA (at a voltage of 16 V) - Max. current of the locked rotor: 10 A (at a voltage of 16 V) - Operating temperature range-15°...+50° C (5°-120° F) - Weight with handle: 2.3 kg (5.07 lb)	**1 (**one**)**

№	Particulars	Configuration	Units needed
		-Stabilizer dimensions (W x D x H)500 x 210 x 420 mm PERIPHERY - Camera holder size max. depth from center of gravity to camera mounting plate: 120 mm - Max. height from the top of the camera mounting plate: 195 mm - Max. width: 160 mm - Connectors for additional devices: - Adjustable 12 V P-Tap connector (2), - USB 500mW (1), DJI Lightbridge (1)power supply for the control unit battery Ronin-M 4S - Communication interface - 2.4 GHz remote control, - Bluetooth 4.0, USB 2.0 Min.	
31.	**Lighting kit** based on: 1 pc for multimedia lab	- Two-color lighting led panel 2x S-2410C (2 devices); - Bi-color Edge Mounted led lighting panel for Studio and out-of-Studio shooting. - Includes 2 tripods, a set of 2 batteries and 2 NP-F975 chargers. - Led panel-240 high-brightness LEDs. - Light intensity at 1 meter 1065Lux, at 2 meters 350Lux. - The angle of the light flux of 75°. - Color temperature, changeable 3200K° - 5600K°. - Power consumption is not more than 60W. - 12-17V power supply. - Platform for self-powered V-lock or DV (Sony F-970). - Weight: 2.85 kg, Diameter: 520mm, Thickness: 50mm	**1 (**one**)**
32.	**Digital camera** based on: 1 pc for multimedia lab	- 35mm 30.4-megapixel EOS 5D Mark IV camera, with 36x24mm full-frame CMOS sensor - The image processor, the DIGIC 6+ - 3.2-inch LCD touch monitor with a diagonal of 1.62 m - DCI 4K video at 30 frames per second; - 8.8 MP Still Grab - 61-point high-density mesh autofocus - Native ISO 32000 extended to ISO 102400 Dual Pixel RAW; - AF zone selection button - Dual pixel CMOS AF and movie server AF 7 frames per second; - CF and SD card slots - Built-in GPS and Wi-Fi with NFC	**1 (**one**)**
33.	**Standard lens for the camera** based on: 1 pc for multimedia lab	- EF 24-105mm f/4 IS II USM standard zoom lens for Canon EF 35mm SLR cameras; - Angle of view (horizontal, vertical, diagonal) - 74°-19°20', 53°-13°, 84°-23°20'; - Lens design (elements/groups) - 17/12; - Number of diaphragm lobes-10; - Minimum aperture-22; - Minimum focal length (m) - 0.45; - Maximum magnification (x) - 0.24 (at 105 mm); - 4-step image stabilizer; - Autofocus drive-ring type ultrasonic motor.	**1 (**one**)**
34.	**Wide angle lens for camera** based on: 1 pc for multimedia lab	- EF 16-35mm f/2.8 L III USM-high-speed wide-angle lens with variable focal length for 35mm Canon EF SLR cameras; - Angle of view (horizontal, vertical, diagonal) 98°-54°, 74°10'-38°, 108°10'-63°;	**1 (**one**)**

№	Particulars	Configuration	Units needed
		- Lens design (elements/groups) - 16/11; - Number of diaphragm lobes-9; - Minimum aperture-22; - Minimum focal length (m) - 0.28 - Maximum magnification (x) - 0.25 (at 35mm)	
35.	**Lens body (zoom) for the camera** based on: 1 pc for multimedia lab	-EF 70-200mm f/2.8 L IS II USM high-Performance telephoto lens with variable focal length for 35mm Canon EF SLR camera; - Angle of view (horizontal, vertical, diagonal) 29°-10°, 19°30'-7°, 34°-12°; - Lens design (elements/groups) - 23/19; - Number of diaphragm lobes-8; - Minimum aperture-32; - Minimum focal length (m) – 1.2 - Maximum magnification (x) - 0.21 (at 200mm); - Autofocus drive-ring ultrasonic drive (USM) - Water - / dust-proof housing	**1 (**one**)**
36.	**Tripod type monopod** based on: 1 pc for multimedia lab	- Tripod type monopod MVMX PROA42WUS; - Load capacity-up to 5kg; - Max. height-79.9"; - Closed length – 30.7 in"; - Sections-4; - Weight-2kg; - Pan and tilt head; - Full liquid base; - Fast-acting flip locks; - D-shaped anti-explosion tubes; - Rubber handle; - Strap; - Case.	**1 (**one**)**
37.	**Memory card** based on: 3 pc for multimedia lab	- 256GB Extreme Pro Com fast Flash memory card (160mb/s)	**3 (**three**)**
38.	**Battery for the camera** based on: 3 pc for multimedia lab	- LP-E6N Li-ion battery for camera - Mark IV (7.2 V, 1865mAh)	**3** (three)
39.	**Camera bag** based on: 1 pc for multimedia lab	-Sling-Style backpack and case for 5D Mark VI camera (black)	**1 (**one**)**
40.	**Photoflash** based on: 1 pc for multimedia lab	- External Speed lite 600EX II-RT flash for EOS cameras; - SBA-E3 reflector adapter; - Color filter SCF-E3OR1; - Mini stand; - Soft case; - St-E3-RT Speed lite transmitter; - Quick charger Watson – with 8 cells for AA / AAA NiMH or NiCd batteries; - 2 packs of MX AA NiMH batteries-Watson (1.2 V, 2550mAh); - Universal accessory Shoe Vello – (Universal Accessory Shoe Mount) - 2 pcs.	**1 (**one**)**
41.	**MQ-300 Studio light set for photography** based on: 1 pc for multimedia lab	- Studio flash MQ-300-3 pcs; - Protective cap for flash – 3 pcs; - Modeling lamp 75 W – 3 pcs; - Power cable – 3 pcs;	**1 (**one**)**

№	Particulars	Configuration	Units needed
		- Sync cable – 1 pc.; - Soft box 50x70cm – 1 pc.; - Studio stand – 3 pcs; - Standard reflector – 2 pcs; - BD-200 reflector (blinds, honeycomb, color filters) - 1 pc; - Snoot reflector (tube, honeycomb, color filters) - 1 pc; - Photo zone for reflection 82cm silver-1 pc; - Radio synchronizer VS-604AC - 1 pc.; - Bag for Studio light – 1 pc.	
42.	**Action camera (with a set of accessories)** based on: 1 pc for multimedia lab	- Hero-5 action camera or higher as a video recorder for recording video with 4K resolution-30 fps, 1080p-120 fps, 720p-240 fps, 1080p-120 in Looping Video mode; - Photo – 12MP with support for RAW format; - Electronic stabilization when shooting; - Night Lapse Mode; - Wide viewing angle Super View: - Hi Light tag function; - Control the camera both from the remote control and via a smartphone or tablet (via Wi-Fi and Bluetooth); - Battery – 1220 mAh.	**1 (**one**)**
43.	**Steadicam manual stabilizing with camera** based on: 1 pc for multimedia lab	- Steadicam manual stabilizing Zenmuse X3 with X3/FC350H camera. with additional battery HB01-522365. - Xthree1 / 2. 3 CMOS number of effective pixels-12.4 MP (total number of pixels-12.76 MP) - FOV 94 lens, 20mm (equivalent to 35mm format) f/2.8 focus 3.5 m; - ISO range 100-3200 (video); 100-1600 (photo); - The range of shutter speed 8-1/8000S (up to 30 sec in manual mode) - Max. image resolution 4000x3000 pixels; - Photo modes time-lapse burst shooting -3/5/7 frames, automatic exposure correction 0.7 EV in 3/5 step increments, self-timer Time laps	**1 (**one**)**
44.	**Wireless microphone combo system** based on: 2 pc for multimedia lab	- Ek 100 G3 belt receiver; - SK 100 G3 transmitter; - Me 2 clip-on lapel microphone; - SKP 100 G3 Converter - Tunable frequencies at 42 MHz - 1680; - Auto-scan frequency of searching of open ranges; - 3-level noise canceller to block interference; - 20 banks with 12-channel presets	**2 (**two**)**
45.	**Lavalier microphone with cable** based on: 3 pc for multimedia lab	- Omnidirectional lapel condenser microphone ECM-77BMP with power supply; - Cable – 3x2, 3mm	**3 (**three**)**
46.	**Reporter microphone with cable** based on: 1 pc for multimedia lab	- Reporter dynamic microphone the MD 42 - Orientation-circular; - Frequency range-40-18000 Hz; - Sensitivity-2.0 mV / PA; - Rated resistance-350 Ohms; - Dimensions 49x250mm - Weight-360 g.	**1 (**one**)**

№	Particulars	Configuration	Units needed
47.	**Sound mixing console** based on: 1 pc for multimedia lab	- ProFX8v2 sound mixer - Inputs: 2 mono mic/line + 2 stereo mic/line + 1 stereo line input; - Outputs: 2 mono mic/line + 2 stereo mic/line; - Active channel sensitivity: adjusts the input sensitivity in the range-60dB ~ -16dB for microphone input and-34db ~ +1odb for linear input; - Equalization – 3-band equalizer in channels 1,2,3/4, and 5/6, 2-band in channels 7/8; - Microphone preamps-4 (low noise with phantom power); - Fader type-60mm; - Number of SPX effects-16; - AUX-1 Aux send + stereo Aux return, easy one-knob-compressors (CHI+2)	**1 (**one**)**
48.	**Control speaker** based on: 4 pc for multimedia lab	- Ms40 phase-inverted monitor loudspeaker - Two-way shelf speaker - Integrated amplifier - Power – 20W - The range chatot 50-25000 Hz - Dimensions (WxHxD) - 173x279x245 mm.	**4 (**four**)**
49.	**External array for online data storage** based on: 2 pc for multimedia lab	- RAID array Rocket Stor 6314A Thunderbolt 2 of 4-bays for a set of disks (4x10TB) on 40TB of memory; -3.5 " 10TB NAS hard drives – 4 PCs. -4 x 3.5" and 2.5" SATA / SAS drive bays -2 x Thunderbolt 2 ports -RAID 0, 1, 5, 6, 10 and JBOD -Windows operating system	**2 (**two**)**
50.	**Portable hard drive** based on: 2 pc for multimedia lab	-Capacity - 10TB, USB 3.0, Interface	**2 (**two**)**
51.	**MCU server** из based on 1 pc to server room	**General Specification** :- -The MCU should be running on a dedicated applicance. The hardware, software should be supplied and supported by a single OEM. -All necessary hardware to support the required capacity needs to be supplied from day one. Each of the server supplied for the MCU must have a redundant power supply from day1. -The MCU must also support Full HD mode and it must provide a capacity of connecting at least 55 sites @1080p30 fps day one or 110 sites @ 720p30fps or 200 sites @SD30fps. -The MCU must be able to host at least 5 simultaneous conferences each having different capacities restricted by the maximum port capacity of the MCU. -Additionally, MCU should support atleast 30 Personal Meeting Rooms, which can be assigned to officials for their meetings. - MCU should be capable of supporting participants using various means i.e. via video enabled phones, room based video endpoints, soft clients on mobile/tablet or via the browser using WebRTC compatible browsers in a single conference. The meeting quality has to be consistent and of high quality. The end points can be	**1** (one)

№	Particulars	Configuration	Units needed
		present on the WAN network or on the internet. In case additional components are required for this functionality, all additional components required to have this functionality has to be included in the solution. - The MCU should have the capability to host meetings with internal and external participants in a secure way such that it should co-exist with the enterprise security policies. -The MCU solution should support H323 and SIP protocols. - The MCU must support the concept of virtual meeting rooms to users who Hosts meeting frequently. Such meeting rooms should support dialing in from standard based video end points, internal and external users and browser based clients. The system should allow one Virtual meeting room per employee, however it should not consume resources when not in use. -The MCU should be able to maintain the dynamic resource allocation capacity for 1080p, 720p and SD participants simultaneously without having to reboot or change any configuration. -The MCU should support 110 ports or more at HD 720p (transmit and receive) up to 4Mbps on IP in continuous presence mode with 30fps, 100 WebRTC connections and H.264 resolution and AES encryption on the same MCU. -The MCU should have Chat Functionality for WebRTC Users during Meeting. -The MCU should have far end camera control. -It should be possible for the MCU administrator to move participants from one conference to another conference from the MCU management panel. -The MCU should display a security icon on the endpoint if the conference is secure. -The administrator should be able to specify maximum resolution for main video and content. -It should allow to change the participants name in a live a conference. -Video conferencing endpoints deployed at other organization must be able to take part in video conferencing. The MCU should be OEM agnostics and should be compatible with endpoints can be of various OEM makes complying with standard H.323/SIP & H.264 ITU-T standards. -Interoperability with all organization must be possible using standards based dialing methodology using the Internet. -The MCU should be able to integrate with Call Control system using SIP/H.323.	

№	Particulars	Configuration	Units needed
		Video Standards : -Should support H.263/H.263+/H.263++, H.264 video algorithms **Video Resolution** : - Should support video resolution from SD to Full HD to join into a conference. - The proposed MCU should be able to combine HD and SD in the same conference without degrading the HD resolution from and to the HD endpoints. The MCU shall interoperate with multiple vendors' endpoints. The supported mediums should be IPv4 and IPv6. **Audio Standards** : - Along with the support for basic algorithms like G.711 and G.722.1 the MCU should also support wideband Audio protocols like MPEG 4 AAC - LC or MPEG 4 AAC - LD or equivalent. **Transcoding & Rate Matching** : -The MCU should support transcoding of different Audio/video Protocols. -MCU should be able to combine HD and SD in the same conference without degrading the HD resolution from and to the HD endpoints. **Dual Video** : -The MCU should have H.239/BFCP protocol for sending and receiving dual video streams (Presenter + Presentation). **Video Layouts** : -At least 25 sites to be seen simultaneously on the screen in traditional Continuous Presence mode. -The MCU must also support advanced continuous presence such that the site that is "on-air" to be seen on a larger window and the other sites are seen in smaller quadrants. **Security Features** : -The MCU must be a secure Non-PC Hardware with a strong operating system. The Hardware and software must be from the same OEM. -The MCU should support 128 Bit strong AES encryption for calls and H.235 for authentication. -The MCU must support encryption for calls on SIP. **Network /USB Interface** : -At least 1 LAN /Ethernet--10/100/1000 Mbps full duplex and dedicated serial/USB connection for maintenance/upgrade. -End to End Solution, Including MCU, Call Control, Firewall Traversal, Desktop/Mobile Clients / WebRTC Solution should be IPv4 and IPv6 complied day one.	

№	Particulars	Configuration	Units needed
		Conference Layout : - MCU Solution should support minimum of 10 or more layouts. -The MCU should have Customised Layout option. Adminsitators can create their own customised layout as per requirement with upto max 25 sites on screen. **Other applications** : -Any requirement of hardware or software such as DNS, NTP, LDAP, Certificates etc required for successful implementation of the MCU should be supplied as part of the solution. **Firewall Traversal** : -Should be supplied with firewall traversal solution for Business to Business (B2B) Video Calling for 80 concurrent calls with users joining the conference from studio based endpoints/Desktop/laptop. Any hardware/VM licenses required for the same should be supplied as part of the solution. **Gatekeeper** : -Should be supplied with a Gatekeeper solution for Video URL dialing for 100 registrations/calls with users joining the conference from studio based endpoints/Desktop/laptop. Any hardware/VM licenses required for the same should be supplied as part of the solution. **Recording & Streaming (Optional)**. -The solution should be supplied with hardware & software for IP based recording of 2 concurrent sessions & 1 live streaming for 50-100 web viewers. **Misc** :- - Warranty is at least 12 months. - Guaranteed replacement of hard drives without removal from the territory of the Academy of the Armed Forces of the Republic of Uzbekistan.	
52.	**Virtualization server**	*Form-factor:* ‣ the server is made in the rack form factor (design) for installation in the 19 server Cabinet of the EIA-310D standard; ‣ height not more than 2U; *Processor:* ‣ Two server microprocessors with x86 architecture, oriented to multithreaded computing, with at least 18 cores and operating at a frequency is at least 2.60 GHz must be installed. ‣ You must be able to work with 64-bit applications at the hardware level; *Memory and data storage:* ‣ at least 128GB of DDR4 2933 ECC RAM must be installed, and the modules must support detecting and correcting more than one error; ‣ the number of memory slots must be at least 24; ‣ the number of slots for installing 2.5 form factor disks is at least 2;	**3 (**three**)**

№	Particulars	Configuration	Units needed
		‣ support for installing SAS, SATA, SSD, NVMe SSD drives; ‣ at least 2 solid state drives is at least 64 GB must be installed; ‣ ability to install and download from micro SD cards; *Network interfaces, I / O ports:* ‣ there must be at least 2 x 10 GB Base T and 2 x 1 GB Base T RJ-45 management port; ‣ two-port network adapter with a bandwidth is at least 10Gbit/s must be installed with support for I / o virtualization functionality – the ability to divide each port into 4 network interfaces, must support the functionality of individual bandwidth control on each of the network interfaces; ‣ at least three USB interfaces located on the outside of the case; ‣ at least one USB 3.0 interface located inside the enclosure; ‣ dedicated port is required to manage the server with a license for full KVM functionality; ‣ at least 3 PCIe 3.0 slots for installing adapters; ‣ at least one Micro SD High Capacity card slot; ‣ at least 2 SFP+ SFP+ 10Gbps direct connection cables are included; ‣ at least 2 two-port Fibre Channel adapters must be installed with a bandwidth is at least 16 Gbit / s per port; ‣ FC the FC adapter must support loading the operating system from the storage system, not loading the server CPU (Full Hardware Offload), NPIV; *Power supply, cooling:* ‣ ‣ at least 2 hot-swappable power supplies is at least 800W must be installed; ‣ the server must support the ability to hot swap the cooling modules; *Operating system:* *Warranty* ‣ Warranty is at least 3 years without returning the drives when the warranty is replaced	
53.	**Virtualization software**	The virtualization software must meet the following requirements: Installing a hypervisor on bare metal); Support for 32-and 64-bit guest operating systems (OS); Support for up to 128 virtual processors; Hot add processors, RAM, and other devices to a running guest OS; Support for advanced physical host RAM optimization mechanisms (page deduplication, dynamic distribution, swap upload, compression, etc.); Hot-add and increase the size of virtual disks for a running guest OS; Integration with storage systems to improve the performance of operations of input-output; Creating virtual machines with up to 1TB of RAM; Support for USB 3.0 devices in virtual machines; Creating virtual machines with dynamically expanding disks (allocating space as it fills up); Building clusters for fault tolerance with minimal VM interruption (High Availability);	**1 (**one**)**

№	Particulars	Configuration	Units needed
		Migrating VMS between hosts without downtime; Providing support for virtual switches with Port Groups, Traffic Shaping, and VLAN technologies; Centralized management of licenses, host and VM updates; Different levels of user access, with the ability to delegate access rights and permissions to each subsystem separately; Support for custom VM templates (VM Template) Availability of a web client for centralized management of the virtual infrastructure; Integration with backup systems; Software licenses for 3 servers; SOFTWARE support must be at least 3 years from the vendor.	
54.	**Storage system**	*Form-factor:* ‣ installation in the 19 server Cabinet of the EIA-310D Type A standard; *Disk space in the storage system:* ‣ At least 12 disks 1.8 TB 12G SAS 10k HDD; ‣ Expandable disk space - at least 7 additional expansion modules; *Configuration:* ‣ the data storage system must be supplied with at least two (2) controllers in a single system; ‣ access to volumes and/or to each volume at the same time must be provided in the active-active mode from all controllers at the same time; ‣ the system must support expansion with Enterprise SAS, Nearline SAS, and SSD disks; ‣ The total amount of cache memory in controllers must be at least 16GB, at least 8GB per controller; ‣ The ability to use SSD disks in storage simultaneously as caching read requests, creating volumes, and multi-level data storage between different types of disks; ‣ At least 2 hot-swap power supplies in the controller shelf and expansion shelves; ‣ Interface for connecting additional SAS extension shelves is at least 12Gb / s; *Number of ports:* ‣ At least 4 x 16gbit/s Fibre Channel ports on each controller with SFP modules and optical cables installed; ‣ To ensure high availability and performance, each disk shelf must be accessible from each controller. *System and data management:* ‣ The system must support different RAID levels, namely RAID 1, 5, 6, 10. ‣ The storage system must ensure that the logical disk data being written is distributed to all disks in the storage pool; ‣ The system must provide multi-level storage and data transfer between different types of disks for optimal use of the system resource (tiering). *Availability:* ‣ Microcode and software upgrades must occur without stopping the system and service, including updates to Nearline SAS disk micro codes.	**1 (**one**)**

№	Particulars	Configuration	Units needed
		‣ The system must maintain continuous operation in the event of failure of: disk, power supply, controller, port, memory, fans. ‣ The cache memory must support data flushing to disk in case of power loss, in addition to protecting the cache memory with a battery. *Compatibility and integration:* ‣ The system must support the following operating systems: Microsoft Windows Server 2012/2016, RedHat EL, SUSE EL, VM ware ES Xi; ‣ The system must be compatible with the built-in MS Windows, Linux, UNIX, VMware operating systems, and data channel redundancy (multipathing) services to ensure fault tolerance and performance of data access; *Technology for efficient resource allocation (Thin Provisioning):* ‣ Support for efficient resource allocation for all applications and all volumes should be provided. ‣ System must support the allocation and deletion of blocks of zeros for space reclamation when data is deleted to increase the efficiency of disk space usage. *Technology for creating instant snapshots of dedicated resources – (Snapshots):* ‣ The system must support snapshot technology (virtual snapshots of the volume state) and volume cloning for the entire space; ‣ The system must support data migration without interrupting the service to another system (of the same type) if necessary; ‣ Support for at least 512 snapshots; *Warranty* ‣ Warranty is at least 3 years, without returning the discs to the manufacturer.	
55.	**Backup system**	*Form-factor:* ‣ installation in the 19 server Cabinet of the EIA-310D Type A standard; *Backup coping:* ‣ backup speed is at least 7TB / hour; ‣ backup speed when using data transfer optimization technologies at least 15TB / hour; ‣ support for replication to a remote backup system; ‣ support for data transfer optimization technologies; ‣ block-level deduplication support; *Capacity:* ‣ the volume of the backup system is at least 36TB of usable space; ‣ maximum possible capacity: at least 100TB of usable space; *Port/network interface configuration:* ‣ at least 4 x 1Gbit/s RJ-45 ports; ‣ dedicated system management port; *Integration:* ‣ integration with Symantec Net Backup, CommVault Simpana, Veeam, HP Data Protector, and other backup systems; *Warranty* ‣ Warranty is at least 3 years, without returning the discs to the manufacturer.	**1 (**one**)**

№	Particulars	Configuration	Units needed
56.	**Backup system software**	**The backup system software** must meet the following requirements *Restoring virtual machines:* ‣ Restore the entire VM on the source server or any other server; ‣ Quick rollback functionality for restoring only changed data blocks; ‣ Support for instant VM recovery from a backup file on the backup storage system; ‣ Restore individual virtual machine files and virtual disks; *Files restoration:* ‣ ‣ Restore files of file systems used in Windows, Linux; ‣ Restore individual VMS, guest OS files, and application objects from EMC VNX, VNX2, and VNXe hardware snapshots, Hewlett Packard Enterprise (HPE) 3par Store Serv, Store Virtual, and Store Virtual VSA, as well as Net App Data ONTAP (FAS, Flex Array V series, Data ONTAP Edge), and others.; ‣ Simultaneous recovery of multiple Active Directory objects, such as user and computer accounts (directly in Active Directory or by exporting in LDIF format), recovery of passwords, containers, and group policy objects; ‣ Restore Exchange objects and then save them, send them by email, or export them to the PST archive, or restore them to the original mailbox; ‣ Support for running a VM from a backup in an isolated environment, for Troubleshooting and testing without affecting the production environment. Ability to create a VM copy from hardware snapshots. Functionality for testing the possibility of recovery without pre-recovery of the VM; *Backup coping:* ‣ Creating consistent VM backups at the image level based on application state; ‣ Fast incremental backup of individual VMS using an existing backup job; ‣ Creating backups and replicas at the VM image level using EMC VNX and VNXe hardware snapshots, HRE 3par Store Serv, Store Virtual, Net App Data ONTAP (including FAS, Flex Array V-Series, Data ONTAP Edge), and others; ‣ Built-in features for deduplication, data compression, and exclusion of paging file blocks; ‣ Archiving VM files and backups to stand-alone tape devices or libraries (including virtual ones) connected to any Microsoft Windows server on the network; ‣ I / O monitoring functionality must be supported to ensure that backup and replication processes do not adversely affect running systems; ‣ Integration with stores that support hardware deduplication, such as EMC Data Domain Boost, NRE Store Once Catalyst, Exa Grid Accelerated Data Mover, and others; ‣ Ability to track changed data blocks to reduce backup time; ‣ Support for VM warev Sphere and Microsoft Hyper-V; *Support and licenses:*	**1 (**one**)**

№	Particulars	Configuration	Units needed
		‣ Licenses for virtual environment backup software must cover the entire number of servers; ‣ SOFTWARE support must be at least 3 years old from the vendor	
57.	**Licenses for the Microsoft Windows Server operating system**	License right to operate 5 virtual machines on 3 servers of the virtualization system in fault tolerance mode.	**1** (one)
58.	**Firewall** based on : 1 pcs in a server room, 1 PC in a laboratory of ICT and cyber security	**Requirements for technical and functional characteristics** Configuration: ‣ at least 2 Ethernet ports 10/100/1000 WAN ‣ at least 14 Ethernet 10/100/1000 LAN ports ‣ at least 2 SFP ports, 1 Gbit/s Ethernet ‣ at least 1 USB 2.0 port ‣ at least 1 dedicated RJ45 port for management Productivity: ‣ Bandwidth in the firewall mode is at least 7gbit / s ‣ Bandwidth in IPS mode is at least 500 Mbit / s ‣ NGFW bandwidth is at least 360 Mbit / s ‣ Bandwidth in SSL Inspection mode is at least 120mbit / sec ‣ Bandwidth in SSL-VPN mode is at least 250mbit / sec ‣ IPsec VPN bandwidth is at least 4 Gbit / s ‣ Availability of a real-time anti-virus scan module for passing traffic Fault-tolerance ‣ Ability to combine two devices into one virtual device; ‣ Active/Active and Active/Passive clustering work times are possible; Completeness: ‣ Can be installed in a 19 " server rack with a maximum of 1U; ‣ Availability is at least 2 1Gbit/c SFP LX transceivers; ‣ License for 80 clients, including antivirus, end-user protection, telemetry, and endpoint verification for compliance with security requirements; Warranty ‣ Warranty for at least 3 years. Subscription for security signature updates for at least 3 years.	**2 (**two**)**
59.	**Data network access switch** based on: 3 pieces to the server room, 1 piece to the ICT and cybersecurity laboratory	Configuration: ‣ at least 48 10/100/1000 Ethernet RJ-45 PoE ports+; ‣ at least 4 100/1000 Ethernet SFP ports; ‣ at least 1 dedicated RJ-45 port for the management network; ‣ at least 1 dedicated console port; ‣ at least 1 USB port ‣ at least one additional slot; Productivity: ‣ Switching matrices - at least 176 Gbit / s; ‣ Stacking – at least 100gbit/c of the stacking module; ‣ Bandwidth – at least 100 million packets per second. ‣ the size of the routing table is at least 2000 entries (IPv4), 1000 (IPv6) ‣ MAC address table size – at least 32000 entries (IPv4) IPv6 support	**4** (four)

№	Particulars	Configuration	Units needed
		Routing protocol: ‣ Static, OSPF v2, OSPF v3, RIP2, RIPng . ‣ Functional support: ‣ Quality of Service, Class of Service, Traffic prioritization, Rate Limit; ‣ IGMP Snooping, STP, RSTP, Jumbo frame, ‣ BPDU port protection, DHCP protection, Dynamic ARP protection, Port security, ‣ Access control lists (ACLs); port-based network access control (IEEE 802.1 x). ‣ Number of VLANs/VLAN IDs at least 2000; ‣ Manageability: ‣ RMON, SNMPv1, v2, v3, NTP, Secure FTP, SSH, RADIUS/TACACS+; ‣ Out-of-band interface (traffic isolation).) ‣ OpenFlow or sFlow support; ‣ Fault-tolerance: ‣ ability to combine up to 8 devices in a fault-tolerant stack, ‣ support for VRRP, Multiple STP, LACP; ‣ Equipment: ‣ height not more than 1U; ‣ availability of a set of mounts for installation in a standard 19 " rack; ‣ switch stack module with a cable length is at least 1 meter; ‣ switching module with 4 ports of 10 Gbit/c SFP+; ‣ at least 2 SFP + 10Gbit/s modules for communication over a single-mode optical cable at a distance is at least 3km. ‣ at least 2 SFP 1Gbit / s modules for communication over a single-mode optical cable at a distance is at least 3km ‣ at least 2 power supplies; ‣ Warranty is at least 3 years.	
60.	**Router** **for 10 ports (Router with optical SPF module)** based on : 1 piece to the ICT and cybersecurity laboratory	**Purpose:** To establish a connection between different network segments **Requirements for the router** -Ports configuration: • at least 1 SFP 1Gbit/s Ethernet WAN port • at least 1 RJ45 1Gbit/s Ethernet WAN port • at least 7 LAN ports RJ45 1Gbit / s Ethernet • at least 2 free expansion slots -Productivity: • routing - at least 900 thousand 64 byte packets per second • IP Sec VPN bandwidth-at least 380mbps/s - size of the routing table – at least 200,000 entries (IPv4) - the number of VPN tunnels – not less than 800 - Routing protocols: Static IPv4, IPv6, RIP, OSPF, OSPFv3, BGP-4, BGP+, IS-IS - Security: support for access control lists (Access Control List – ACL), TACACS+, RADIUS, SSHv2, NAT, URPF, IP Sec VPN (DES, 3DES, AES 128/192/256), storm protection in the network. - Manageability: support for hierarchical structure of CLI, SNMPv1, v2, v3, RMON, NTP, FTP, TFTP, SFTP	**1** (one)

№	Particulars	Configuration	Units needed
		- Fault tolerance: ability to combine multiple devices into a fault-tolerant stack, support for VRRP, BFD, EAA - Equipment: at least 1 SFP 1Gbit / s Ethernet module for communication over single-mode optical fiber at distances up to 10 km, a set of mounts for installation in a standard 19" rack.	
61.	**Core switch** based on: 1 piece to the ICT and cybersecurity laboratory	Configuration: ‣ at least 2 slots for installing switching modules ‣ at least 2 QSFP 40Gbps Ethernet ports ‣ at least 1 dedicated RJ45 port for management ‣ at least 1 dedicated RJ45 console port ‣ at least 1 USB 2.0 port ‣ at least 2 power supplies ‣ at least 2 ventilation units. Productivity: ‣ Switching matrices - at least 1000 million packets per second. ‣ capacity –not less than 1440 GB/s ‣ the size of the routing table is at least 128,000 entries (IPv4), 64,000 entries (IPv6) ‣ MAC address table size-at least 288,000 entries (IPv4) ‣ IPv6 support Routing protocols: ‣ Static IPv4 and IPv6, OSPF v2, OSPF v3, BFD, RIP/RIPv2/RIPng, BGP, BGP-4, BGP+,IS-IS, MPLS ‣ Policy-based routing, IPv6 tunneling, Switching protocols: ‣ STP (IEEE 802.1D), Rapid STP (RSTP, IEEE 802.1w), Multiple STP(MSTP, IEEE 802.1s), ‣ IEEE 802.3ad Link Aggregation, IGMP, IGMP Snooping, DHCP, DHCP Snooping, ARP, Jumbo frame, Port security ‣ DCB, DCBx, ETS, ECN, FCoE, QoS, PFC, Packet filtering ‣ VXLAN, MAC-based VLAN, LLDP-MED ‣ Number of VLAN is at least 4096 Manageability: ‣ RMON, SNMPv1/v2c/v3, NTP, SNTP, FTP, Telnet, SSH. ‣ Full console (CLI) ‣ Out-of-band interface ‣ Ability to save multiple configurations on the flash. Dual Flash Images ‣ RADIUS and TACACS+ authentication. ‣ Open Flow or Flow support Fault-tolerance: ‣ ability to combine up to 9 devices in a fault-tolerant stack, ‣ support VRRP, BFD, DLDP, Graceful restart for OSPF, BGB, ISIS. ‣ Updating the software without interrupting the service Completeness: ‣ Height not more than 1U ‣ availability of a set of mounts for installation in a standard 19 " rack, ‣ at least 2 switching modules with a total is at least 48 SFP+	**1 (**one**)**

№	Particulars	Configuration	Units needed
		1/10Gbit/s Ethernet ports And at least 4 QSFP 40gbit/s Ethernet ports ‣ availability is at least 2 QSFP+ (DAC) cables for communication between core switches, ‣ Availability of 2 power supply units and 2 hot-swap ventilation units. Warranty ‣ Warranty for at least 3 years.	
62.	**Server rack** based on: 2 pieces per server room	*Rack parameters:* ‣ height not less than 42U, width not less than 600mm, depth not less than 1000mm; ‣ lockable front and rear doors with at least 80% perforation (on the front door), evenly distributed over the entire height for optimal flow of cooling air; ‣ lockable side panels; *Completeness:* ‣ availability of a grounding kit; ‣ availability of a rack stabilization kit; ‣ availability is at least one set of mounting brackets for the rack; ‣ possibility of static installation and wheels for moving the rack in a room with a load of up to 1000 kg; ‣ at least 2 power distribution modules with 12x13.	**2 (**two**)**
63.	**Uninterruptible power supply** based on: 6 pcs per server room	*Form-factor:* ‣ installing the EIA-310D standard in the 19 inch server Cabinet; *Parameters:* ‣ Online UPS with at least 3KW power requirement; ‣ Nominal input voltage - 230 V ‣ Input voltage range: 165-290V; ‣ Supported equipment power: at least 2.5 KW ‣ Input connector-IEC C20 ‣ number of IEC C19 outputs at least 1, number of C13 outputs at least 8 or provision of external PDU based UPS to meet the requirement; ‣ Battery type-valve-controlled, leak-proof, lead-acid; ‣ Hot-swappable batteries; ‣ Up to 4 additional battery modules can be connected; ‣ At least 8 minutes of operation at 50% load ‣ Availability of the network management module (RJ45 Ethernet interface) using SNMP, WEB, or vendor management SOFTWARE; *Warranty* ‣ Warranty is at least 12 months.	**6** (six)
64.	**Touch vertical information kiosk** based on: 2 pcs per ICT CLC corridors	‣ Main technical characteristics ‣ Diagonal of 55” inches ‣ Full HD resolution up to 1920 x 1080 pixel ‣ Intel Core i3 CPU ‣ Hard disk at least 128 Gb SSD ‣ DDR 3 RAM at least 8 Gb ‣ Contrast 1100:1 ‣ Brightness 400 cd/m^2 ‣ 16:9 aspect ratio	**2 (**two**)**

№	Particulars	Configuration	Units needed
		‣ Number of touches 10 touch ‣ Response time 8 ms ‣ Gigabit Ethernet LAN interface ‣ Windows 10 operating system ‣ Metal body ‣ Tempered glass ‣ Warranty for at least 1 year after commissioning	
65.	Installation, delivery, commissioning, testing, Cable lying and fitting Labour	Required for network establishment and software installation and testing for all devices - Skilled job	Calculate as per the list of devices
It is necessary to provide the necessary number of cables, connectors, adapters, converters and other connecting materials for the project implementation.			

Section: 7 (Summary of Project Cost)

Sr. No.	Particulars	Amount (Rs.)
I	SECTION V-A – SCHEDULE OF REQUIREMENT (Bill of Material)	
1.	Section – 1 (Material Cost)	
2.	Section: 2 (Transportation Cost)	
3.	Section: 3 (Statutory Cost)	
4.	Section: 4 (Installation Cost)	
II	SECTION V-B – SCHEDULE OF REQUIREMENT (Bill of Material)	
	Total Cost	