



# جامعة عليا Aliah University

(A UGC & AICTE approved autonomous Institution under the Dept of MA&ME, GoWB)  
IIA/27, New Town, Rajarhat, Kolkata – 700 160, West Bengal

Web: [www.aliah.ac.in](http://www.aliah.ac.in)

## **NOTICE INVITING TENDER**

Ref No **047/AU/REG/NIT/18-19**

Date: 28/11/2018

**Sub: Sealed Tenders are invited from the bonafide and resourceful Contractors/Service Providers/Agents/Wholesalers/Suppliers for Supply and Installation of NETSIM software, Single user, Academic version for Department of Mechanical Engineering, Aliah University New Town Campus.**

Aliah University, Kolkata a Premier Educational Institute under the Dept of MA&ME, GoWB, invites **Sealed Tenders are invited from the bonafide and resourceful Contractors/Service Providers/Agents/Wholesalers/Suppliers for Supply and Installation of NETSIM software, Single user, Academic version for Department of Mechanical Engineering, Aliah University New Town Campus.** The tentative quantity of the required items along with technical configuration of each items are mentioned at Annexure separately. Aliah University is looking for interested bidders who have experience in supplying of above type of materials. NIT document will be downloaded from Website of Aliah University, <http://www.aliah.ac.in>. Tender must be submitted on or before **21/12/2018 at 03 P.M** at the Office of the Registrar, Aliah University, IIA/27, New Town, Kolkata- 700160, West Bengal, India by Speed-post/registered Post/by hand. Incomplete applications or applications received after the last date of submission will not be considered. **The sealed envelope must be with super scribing the Name, e-mail, Contact No. of Tenderer, NIT Reference Number and Purpose of NIT.** Interested bidders are requested to provide **their Quotes following the format in Annexure- II** in their official letter heads along with signed **Compliance Statement and Price Bid (Annexure- III)**. They must read and accept Terms and **Conditions and scope of work** of this NIT as per **Annexure- I**. For any information in this regard please visit Dept of Mechanical Engineering, Aliah University, New Town Campus. Information may also seek from the following e-mails to [registrar@aliah.ac.in](mailto:registrar@aliah.ac.in); [storeandpurchase.au@gmail.com](mailto:storeandpurchase.au@gmail.com) and the emails will be forwarded to the respective Department

Sl.	Schedule	Date & Time
1	Date of uploading of NIT (Publishing Date) at Aliah University Website	<b>04/12/2018 at 02 P.M</b>
2	Bid submission start date	<b>05/12/2018 at 12 P.M</b>
3	Bid Submission closing	<b>21/12/2018 at 03 P.M</b>
4	Techno Commercial Bid opening date O/o The <b>Registrar, IIA/27, New Town, Rajarhat, Kolkata – 700 160. (The Bid Opening date and time is tentative and could be open on availability of Concerned Committee Members)</b>	<b>24/12/2018 at 02 P.M</b>

Sd/-  
Registrar  
Aliah University

### **ANNEXURE I: GENERAL TERMS & CONDITIONS**

- Supply and Installation of NETSIM software, Single user, Academic version** to be done at **Department of Mechanical Engineering, Aliah University New Town Campus, IIA/27, New Town, Kolkata – 700 160, West Bengal** within 21 working days of issuing work order.
- The Tenderer should bear all the transportation & insurance **risk** till the on door delivery point. Selected bidder shall take all possible care for Govt. Property & of any damages due to negligence of his workers; the bidder/Agency shall be responsible for all such damages & repair the same at his own cost.
- The rates** so quoted must be inclusive of GST, Central Excise, customs Duty if any, packing freight to destination, Insurances, installation (if any), warranty and levies and necessary delivery at designated places at Aliah University and all charges. No extra charges will be entertained. Prices can be quoted in Indian Currency only (₹). No extra payment will be made for carrying of materials involving head load/ trolley etc.

4. **Warranty as per OEM. Warranty document (if any) must be delivered with the Article.**
5. All necessities cables and adapters for functioning of the equipments to be supplied
6. Supply of Items will be made in conformity with the specification & time as mentioned in the work order as decided by the authority. **No deviation in specification** will be accepted. After delivery of the materials to the respective points by selected bidder (s), authority reserves the right to collect the samples of supply the materials at random basis and send those materials for testing to ensure the quality of products etc. If it is found that materials are not according to the specification, the authority has every right to cancel the total lot or otherwise forfeit the security money, blacklisting the respective Manufacturer / Supplier and terminate the contract.
7. If any part of the service in respect of the work assigned and undertaken by you not rendered/delivered in time, Aliah University shall be entitled to levy and recover liquidated damages/ penalty at 1% per week or part thereof the delay/ default, subject to 5% maximum, on the payment due to the agency/contractor for the particular stage. Any delay beyond scheduled dates may attract higher penalty to be decided by the Aliah University
8. **Partial quotations are not allowed for this tender i.e. bidder may quote all item. For overall item lowest bidder (L1) will be selected.**
9. All disputes are subject to exclusive jurisdiction of competent Court and Forum in Kolkata, India only.
10. Any dispute arising out of this contract shall be referred to the Registrar, Aliah University, and if either of the parties hereto is dissatisfied with the decision, the dispute shall be referred to the decision of an Arbitrator, who should be acceptable to both the parties, to be appointed by the Vice-Chancellor of the University. The decision of such Arbitrator shall be final and binding on both the parties.
11. Payment Condition:-The prices shall be inclusive of all taxes & levies including GST and other statutory duties as applicable. Rate of taxes should be indicated separately in the Price Bid. Contract Price specified in Price Bid should be based on the taxes & duties and charges prevailing at the date one day prior to the last date of Bid submission. Statutory deduction, wherever applicable, shall be made from invoice as per government rules. Necessary certificate will be issued for such deductions. Bidder submitting a bid shall produce valid statutory documents / certificates with respect to GST, Income Tax, ROC, Prof. Tax, Trade Licence, etc. All such documents / certificates shall remain valid on the last date of tender submission. GST component of the invoice of the bidder may be kept on hold in case there is any mismatch / irregularity in GST return filling on the part of the bidder. 100% payment will be released after receiving of items in good order and condition and installation (if any) duly certified by the concern authority and immediately on receipt of payment from the Govt. Department (within 60 days from the submission of bills). Successful vendor should arrange to submit a performance security deposit in form of Performance Bank Guarantee to the tune of 10% amount of the total purchase value at the time of submitting the bill. This performance security deposit should be issued from any Nationalized Bank and validity of the same will be till 1 year/warranty period +60 days whichever is higher from the date of delivery of the material. The payment will be made by RTGS / FUND Transfer mode only. Advance payment not allowed. Hence, following information must be clearly written in the Price Bid for RTGS / FUND TRANSFER:;
  - A. Name of the Firm with complete postal address
  - B. Name of the Bank with Branch where the Account exist
  - C. IFSC CODE
  - D. ACCOUNT No
  - E. PAN No
12. The Tenders are liable to be rejected if the fore going conditions are not complied with. The bid should be complete in all respects and duly signed wherever required. Incomplete and unsigned offer will not be accepted.
13. The products asked for should be of very high standard and preferably reputed brand and/or with **B.I.S/I.S.I** code.
14. All bidders must submit all Technical Documents as per Annexure II otherwise their bid may be cancelled.

**Annexure II : Technical Bid Application Format**  
**(Please attach all relevant documents)**

To, The Registrar  
Aliah University  
IIA/27, New Town,  
Kolkata-700 160

**Sub: Application for 1. Supply and Installation of NETSIM software, Single user, Academic version for Department of Mechanical Engineering, Aliah University New Town Campus.**

Ref: - \_\_\_\_\_N.I.T. No .....dated .....

Sir,

1. ABOUT THE ORGANIZATION	
1.1	Name of the Organization
1.2	Name of Authorized Person
1.3	Registered Office Address with telephone no. & email address
1.4	Authorized Service Station Name, address, contact person name, phone number, e-mail
2. TECHNICAL DOCUMENTS	
2.1	Company Registration No./Trade License No./Partnership Deed No. (Please attach documentary evidence)
2.2	PAN Registration No (Please attach documentary evidence)
2.3	GST Registration No (Please attach documentary evidence)

**ANNEXURE III COMPLIANCE STATEMENT AND PRICE BID**

Sl	Item Description For any enquiry/ clarification /measurement bidders are requested to visit/Contact the site Department of Mechanical Engineering, Aliah University New Town Campus, IIA/27, New Town, Kolkata – 700 160	QTY and UNIT in Nos	Compliance to Tender specification whether YES/ NO	BASIC RATE (Unit Price X Unit)	GST in Amount and in %	TOTAL AMOUNT With Taxes Altogether
1	<b>NETSIM software, Single user, Academic version</b> NetSim Standard Version Network Simulation Software - Technical Specifications Discrete Event Simulator of the following networking protocols Component 1 - Internetworks • Ethernet – As per IEEE 802.3, CSMA / CD, ARP, Fast and Gigabit Ethernet. Ethernet Switching with STP as per IEEE 802.1 D • Wireless LAN – As per IEEE 802. 11 a, b, g, n, ac, e & p standards. CSMA/CA protocol with RTS / CTS exchange. Infrastructure BSS and DCF mode • TCP – Old Tahoe and Tahoe flavors as per IETF RFC 2001. Retransmission timer management and RTT Variance estimation using Jacobson’s algorithm. Exponential RTO backoff and dynamic window sizing on congestion. Reno (Fast Recovery), New Reno (retransmission during the Fast recovery), BIC and CUBIC algorithms, Window Scaling and Selective Acknowledgement. • UDP – As per IETF RFC 768 with encapsulation • Routing – Routing Information Protocol (RIP) implemented as per IETF RFC 1058. Open Shortest Path First (OSPF) implemented as IETF per RFC 2328. Queuing and implementation of periodic time, update time, invalid timer and flush timer. Routing tables containing source, destination, next hop cost and interface. Component 2 – Legacy Networks • Aloha, Slotted Aloha • CSMA/CD - with truncated binary back off algorithm with attempt limit of 16. • Token Bus – As per IEEE 802. 4, Solicit Successor and who follows • Token Ring – As per IEEE	01 No				

<p>802.5. Interfaces between LLC and MAC, PHY and MAC Component 3 – BGP Networks • Border Gateway Protocol (BGP) implemented per RFC 1771. Path Vector Routing, Routing Tables, Loop Prevention, BGP messages. Component 4 – Advanced Wireless Networks (MANET, Wi-Max) • MANET: Dynamic Source Routing (DSR) implemented as per RFC4278 and Adhoc on Demand Distance Vector Routing (AODV) per RFC 3561. Mobility is via the Random waypoint model, Random Walk, Group mobility, File Based Mobility, which is designed to describe the movement pattern of mobile users, and how their location, velocity and acceleration change over time. Zone Routing Protocol (ZRP) per Section 10 of RFC 2026 and Optimized Link State Routing (OLSR) per RFC 3626 • WiMAX: implemented as per IEEE802.16d-2004. Traffic is via Erlang B call model. Analysis of Call blocking probability, DL-MAP/UL-MAP scheduling, Call admission control. Component 5 – Cellular Networks: GSM and CDMA • GSM (Global System for Mobile): Implemented as per 3GPP and ETSI standard. Traffic is via Erlang B call model. Analysis of Call blocking probability, Different technique of channel allocation scheme, Handover. Mobility is as per Random waypoint and Random walk model. • CDMA (Code division multiple access): Implemented as per IS95 A/B. Traffic is via Erlang B call model. Analysis of Call blocking probability, Call dropping probability, one call class of channel allocation scheme, Handover. Mobility is as per Random waypoint and Random walk model. Component 6 – Internet of Things • Wireless Sensor Network, Internet of Things and Zigbee per IEEE 802.15.4 MAC and PHY. 802.15.4 PHY: Change radio state, Received power calculation, Shadow Loss, Path Loss Error, Bit Error Rate, Channel Formation, Clear Channel Assessment, SINR Calculation. 802.15.4 MAC: Locate back-off boundary, Super Frame, Beacon mode, Back-off Calculation, GTS, Unslotted CSMA / CA, Slotted CSMA / CA • RPL Routing protocol covering Local DODAGs Route Discovery, Rank Properties, Loop Avoidance, RPL Instance, ICMPv6 RPL Control Message, Sequence Counters, Upward Routes, Downward Routes, Non-Storing Mode, Packet Forwarding and Loop Avoidance/Detection, Maintenance of Routing Adjacency. Component 7 – Cognitive Radio Networks • Cognitive Radio per IEEE 802.22 standards covering Spectrum manager: Form Channel set, CPE association, SSA Init, Quiet period scheduling, Quiet period, SSF,UCS, Channel switching, Channel update, Form USMAP, Form USBurst, Transmit USBurst, Form UCD, Transmit SCH, Process SCH, Data packet forwarding, OFDMA init, Incumbent start, Incumbent end, Fragment packet, Transmit FCH, Process FCH, Service Flow: Create Service flow, Process DSA Req and RSP, Process DSD and RSP, Terminate service flow. Operational Interval and Operational frequency is changed to OFF_Duration and ON_Duration Component 8 – LTE and LTE-Advanced Networks • LTE Network layer, Data link and physical layer</p>				
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<p>implementation is as per standards 3GPP 36.xxx. UE, eNB with MME can be used for the scenario building and simulation. • Network layer: Handover Decision, Handover Initiation, Handover routing, MME routing Handover control packet processing • Data Link layer: PDCP init, Header compression/ Uncompression, Data sequencing, RRC Connection establishment – Paging, T300 expiration, RLC - RLC SDU formation, Data forwarding, Mac Scheduler - Round Robin, Max CQI, Proportional fair scheduling, GBR Queue, Non GBR queue • Physical layer: Received Power Calculation, Path Loss – Fading, Shadowing, SINR calculation, BER calculation, CQI Reporting, CQI_MCS mapping, MCS_TBS mapping • Mobility is via the Random waypoint, Random Walk, Group mobility • LTE-A Network layer, Data link and physical layer implementation is as per standards 3GPP 36.xxx. UE, eNB, Relay with MME can be used for the scenario building and simulation. • Physical layer: Carrier Aggregation, Transmission index – MIMO concept, and featuring relays nodes • LTE D2D (where UEs can communicate directly with each other) and LTE Femtocell with HNB gateways are implemented Component 9 – Vehicular Adhoc Networks • VANET: implemented as per IEEE 1609 WAVE, • Basic Safety Message (BSM) protocol per J2735 DSRC. • Dynamic interfacing with SUMO through TraCI API's Network Emulator (Add On) • Connect real hardware running live applications to NetSim Simulator. Emulation not available for Legacy Networks, Wireless Sensor Network, Zigbee Network and Cellular Networks • Multicasting is implemented Source Code Source C code must be provided for all components protocol libraries with DLL interfacing for simulation in the loop debugging. Traffic Generator (All components except component 5 and 6) The following traffic models are available in NetSim • File Transfer Protocol (FTP) • Database Application • Voice Traffic • Video Traffic • Custom Model: Users can develop custom application model based on Packet size and inter-arrival time available in the following probability distributions • Email • HTTP • Peer to Peer • CBR • Application encryption using AES and DES algorithms Traffic Generator (Component 5) • Erlang Voice call model Traffic Generator (Component 6) • Sensor_App Performance Metrics Network, Sub network and Link by Link levels covering Simulation time, Response time, Throughput, Normalized throughput, Medium Access time, Queuing Delay, Mean Delay, Details of control frames such as RTS and CTS, RIP packets etc. Graphical plots over time for link and application throughputs and TCP congestion windows. Detailed Packet Trace (All Components) • All protocols have detailed packet level trace generated in a tab ordered .txt, .xlsx format. • Packet trace contains the details of packet like packet number, source, destination, arrival time, payload, overheads etc. Detailed Event Trace (All Components) • All protocols have detailed event level trace generated in a tab ordered .txt, .xlsx format. • Event trace contains the details of event like Event Time, Event Type, Device Type, Application ID</p>				
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<p>etc. Dynamic Metrics: Dynamic metrics allows users to monitor the value of a parameter over simulation time. Channel Models (For wireless protocols) The following channel (propagation) models should be available for wireless protocols: • Friis Free Space • Log Distance • Const 231 HATA Urban • Const 231 HATA Suburban • HATA Urban • HATA Suburban • Indoor Office • Indoor Factory • Indoor Home Fading model: Rayleigh, Nakagami Shadowing: Lognormal, Constant Command Line Interface – CLI • CLI mode of running for more concise and powerful means of control • Facilitates use of automated scripts for running batch simulations • Model network configurations using XML based configuration files Packet Animation • Animates packet flow over wired and wireless links, as well as node movement • Color variation for data, control and error packets • Animation settings via play, pause and time-slide External Interfacing: • Interfacing with SUMO, MATLAB and Wireshark. Network Programming Exercises in C • Address Resolution Protocol • Assignments of Sites to Concentrators • Cryptography: Substitution, Transposition, XOR, Advanced - Data Encryption Standard, Rivest Shamir Adleman (RSA), Wired Equivalent Privacy (WEP) • Distance Vector Routing • Dynamic Host Configuration Protocol • Error Correcting Code - Hamming Code • Error Detection Code - Cyclic Redundancy Check (CRC), Longitudinal Redundancy Check (LRC) • Framing Sequence - Bit Stuffing, Character Stuffing • Generic Cell Rate Algorithm - Virtual Scheduling Algorithm • IPV4 Addressing - Address Mask, Binary Conversion, Classless Inter Domain Routing, Network Address, Special Addresses, Sub-netting • IPV6 Addressing – EUI-64 Interface Identifier, Host Address, Subnetting • Leaky Bucket Algorithm • Multi Level Multi Access • Multiple Access Technology – CDMA, TDMA, OFDMA • PC to PC Communication - Socket Programming, Chat Application • Scheduling - First In First Out (FIFO), Max - Min Fair (MMF) • Shortest Path - Floyd’s, Link State • Sliding Window Protocol - Go Back N, Selective Repeat • Sorting Technique - Bubble Sort, Insertion Sort, Quick Sort, Selection Sort • Spanning Tree – Borovska, Kruskal, Prims • Transmission Flow Control - Go Back N, Selective Repeat, Stop and Wait Complete source code should be provided for all programming exercise.</p>				
<p><b>Total Amount in Rupees</b></p>				
<p><b>Total Amount in Word</b></p>				

**Declaration**

I, Sri/Smt. .... The Managing Director/Proprietor (etc.) of the Firm.,..... (Name of the firm) At (address)..... do hereby solemnly affirm and declare as follows:

1. That I have not ever been convicted of any offence making myself liable to be disqualified to provide any goods/services/work to any Educational Institutions/Govt. or Govt. undertaking Organization /Institution in the State of West Bengal or other State or States.

2. That no case is pending against me or against my firm in any criminal court of law or blacklisted/debarred/banned to provide similar items to the Educational Institutions / Govt. or Govt. undertaking Organization / Institution in the State of West Bengal or other State or States ( If any case is pending, state the details ).

3. That, I also declare that if any information subsequently found incorrect or false will it automatically render the tender submitted by me cancelled and make me liable for penal/legal action as per law of the country.

4. That I do further affirm that the statements made by me in this tender are true to the best of my knowledge and belief and all the documents attached are genuine & correct.

5. I/We agree to supply the above goods/equipment/products in accordance with the technical specifications for a total contract price of Rs..... (Amount in figures) (Rupees .....amount in words) within the period specified in the invitation for Quotation. We confirm that the normal commercial warranty/guarantee of mentioned in this Quotation shall apply to the offered items and we also confirm to agree with terms and conditions as mentioned in the invitation letter. We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery. Certify that all above information are correct to the best of my/our information, knowledge and belief.

**Signature of the Bidder**

**Date** \_\_\_\_\_

**Name** \_\_\_\_\_

**Designation** \_\_\_\_\_

**Seal**

**Ref. No: 047/AU/REG/NIT/18-19**

**Dated: 28/11/2018**

Copy to:

- 1. Chairman, Departmental Purchase Committee, Dept of Mechanical Engineering, Aliah University**
- 2. Notice Board at Aliah University**
- 3. Website: [www.aliah.ac.in](http://www.aliah.ac.in)**
- 4. One Bengali News paper**
- 5. Guard File**

**Sd/-  
Registrar  
Aliah University**