Indian Institute of Technology Delhi is in the process of purchasing following item(s) as per details as given as under.

<table>
<thead>
<tr>
<th>Details of the item</th>
<th>Tender for Motion Analyzing System using Brain Computer Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnest Money Deposit to be submitted</td>
<td>NIL. However, bidders are required to submit ‘Bid Security Undertaking’ in lieu of EMD (Annexure-IX)</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 Years/1 साल</td>
</tr>
<tr>
<td>Performance security</td>
<td>3% of Contract value</td>
</tr>
<tr>
<td>Delivery Schedule</td>
<td>Maximum of 16 weeks from the date of the opening of LC</td>
</tr>
</tbody>
</table>

Tender Documents may be downloaded from Central Public Procurement Portal [http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app). Aspiring Bidders who have not enrolled / registered in e-procurement should enroll / register before participating through the website [http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app). The portal enrolment is free of cost. Bidders are advised to go through instructions provided at ‘Instructions for online Bid Submission’.

No manual bids will be accepted. All quotation (both Technical and Financial should be submitted in the E-procurement portal).
<table>
<thead>
<tr>
<th><strong>Name of Organization</strong></th>
<th>Indian Institute of Technology Delhi</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tender Type</strong> (Open/Limited/EOI/Auction/Single/Global)</td>
<td>Global</td>
</tr>
<tr>
<td><strong>Tender Category (Services/Goods/works)</strong></td>
<td>Goods</td>
</tr>
<tr>
<td><strong>Type/Form of Contract (Work/Supply/Auction/Service/Buy/Empanelment/Sell)</strong></td>
<td>Supply</td>
</tr>
<tr>
<td><strong>Product Category (Civil Works/Electrical Works/Fleet Management/Computer Systems)</strong></td>
<td>Motion Analyzing System using Brain Computer Interface</td>
</tr>
<tr>
<td><strong>Source of Fund (Institute/Project)</strong></td>
<td>Budget Code: Equipment / Project Code RP04191G</td>
</tr>
<tr>
<td><strong>Is Multi Currency Allowed</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Date of Issue/Publishing</strong></td>
<td>06/04/2023 (15:00 Hrs)</td>
</tr>
<tr>
<td><strong>Document Download/Sale Start Date</strong></td>
<td>06/04/2023 (15:00 Hrs)</td>
</tr>
<tr>
<td><strong>Document Download/Sale End Date</strong></td>
<td>03/05/2023 (15:00 Hrs)</td>
</tr>
<tr>
<td><strong>Date for Pre-Bid Conference</strong></td>
<td>---</td>
</tr>
<tr>
<td><strong>Venue of Pre-Bid Conference</strong></td>
<td>---</td>
</tr>
<tr>
<td><strong>Last Date and Time for Uploading of Bids</strong></td>
<td>03/05/2023 (15:00 Hrs)</td>
</tr>
<tr>
<td><strong>Date and Time of Opening of Technical Bids</strong></td>
<td>04/05/2023 (15:00 Hrs)</td>
</tr>
<tr>
<td><strong>Tender Fee</strong></td>
<td>Rs.NIL/- (For Tender Fee)</td>
</tr>
<tr>
<td></td>
<td>(To be paid through RTGS/NEFT. IIT Delhi Bank details are as under: Name of the Bank A/C : IITD Revenue Account SBI A/C No. : 10773572622 Name of the Bank : State Bank of India, IIT Delhi, Hauz Khas, New Delhi-110016 IFSC Code : SBIN0001077 MICR Code : 110002156 Swift No. : SBININBB547 (This is mandatory that UTR Number is provided in the online quotation/bid. (Kindly refer to the UTR Column of the Declaration Sheet at Annexure-II)</td>
</tr>
<tr>
<td><strong>No. of Covers (1/2/3/4)</strong></td>
<td>02</td>
</tr>
<tr>
<td><strong>Bid Validity days (180/120/90/60/30)</strong></td>
<td>90 days (From last date of opening of tender)</td>
</tr>
<tr>
<td><strong>Address for Communication</strong></td>
<td>Dr. Sitikantha Roy, Professor, Department of Applied Mechanics &amp; School of Artificial Intelligence, Block IV Room 243, Indian Institute of Technology, Delhi HauzKhas, New Delhi, Delhi 110016, India</td>
</tr>
<tr>
<td><strong>Contact No.</strong></td>
<td>011-26591220</td>
</tr>
<tr>
<td><strong>Email Address</strong></td>
<td><a href="mailto:sroy@am.iitd.ac.in">sroy@am.iitd.ac.in</a></td>
</tr>
</tbody>
</table>

**Chairman Purchase Committee**
(Buyer Member)
Instructions for Online Bid Submission/ऑनलाइन बोली (बिड) के लिए निर्देश:
As per the directives of Department of Expenditure, this tender document has been published on the Central Public Procurement Portal (URL:http://eprocure.gov.in/eprocure/app). 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:
http://eprocure.gov.in/eprocure/app

REGISTRATION

1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL:http://eprocure.gov.in/eprocure/app) by clicking on the link “Click here to Enroll”. Enrolment on the CPP Portal is free of charge.

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

3) 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.

4) 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 / TCS / nCode / eMudhra etc.), with their profile.

5) 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 DSCs to others which may lead to misuse.
6) Bidder then logs in to the site through the secured log-in by entering their userID / password and the password of the DSC / eToken.

बोलीदाता फिर अपने यूजर आईडी / पासवर्ड और डीएससी / इटीक नेटवर्ड के पासवर्ड को दर्ज करके सुरक्षित लॉग-इन के माध्यम से साइट पर लॉग ऑन करता है।

SEARCHING FOR TENDER DOCUMENTS/निविदा दस्तावेजों के लिए खोजना

1) 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.

सीपीपी पोर्टल में निम्नलिखित बिंदु खोज क्रिया हैं, ताकि बोलीदाताओं को कई मापदंडों से संबंधित निविदा खोज सकें। इन मापदंडों में निविदा आईडी, संगठन का नाम, स्थान, तिथि, मुल्य आदि शामिल हो सकते हैं। निविदाओं के लिए उज्ज्वल खोज का एक क्रिया भी है, जिसमें बोलीदाता कई नामों को जोड़ सकते हैं जैसे संगठन का नाम, अनुबंध का स्थान, स्थान, सीपीपी पोर्टल पर प्रकाशित निविदा की खोज के लिए तारीख, अन्य कीवर्ड आदि।

2) 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.

बोलीदाताओं ने एक बार निविदाएं चुनी हैं जिसमें वे रुचि रखते हैं,उसका वे आवश्यक दस्तावेज़ / निविदा कार्यक्रम डाउनलोड कर सकते हैं। ये निविदाएं मैरी निविदाओं फ़ोल्डर में दे जाईजा सकती हैं। इससे सीपीपी पोर्टल को बोलीदाताओं को एसएमएस / ई-मेल के माध्यम से सूचित किया जा सकता है, यदि निविदा दस्तावेज़ में कोई संशोधन जारी किया गया है।

3) 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.

बोलीदाता को प्रत्येक निविदा को निर्देश अद्वितीय निविदा आईडी का नोट बनाना चाहिए, अगर वे हेल्पडेस्क से कोई स्पष्टीकरण / सहायता प्राप्त करना चाहते हैं।

PREPARATION OF BIDS / बोली (विड) की तैयारी

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

बोलीदाता को अपनी बोदलयां जम करने से पहले निविदा दस्तावेज पर प्रकाशित किसी भी शुद्धि को ध्यान में रखना चाहिए।

2) 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.

कृपया बोली के भाग के रूप में जम किए जाने वाले दस्तावेजों को समझने के लिए निविदा विज्ञापन और निविदा दस्तावेज ध्यान से देखें। कृपया उन अंकों की संख्या पर ध्यान दे जिसमें बोली दस्तावेज जमा करना है, दस्तावेजों की संख्या - जिसमें प्रत्येक दस्तावेज के नाम और सामग्री शामिल हैं, जिन्हें प्रस्तुत करने की आवश्यकता है। इनमें से कोई भी विचलन बोली को अद्वीतीय कर सकता है।

3) 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 formats. Bid documents may be scanned with 100 dpi with black and white option.

बोलीदाता, अग्रिम में, निविदा दस्तावेज / अनुसूची में बताए अनुसार प्रस्तुत करने के लिए बोली दस्तावेज तैयार करना चाहिए और आम तौर पर, वे पीडीएफ / एसएसएस / आरएएच / डीएड्डब्ल्यूएफ स्वरूप में हो सकते हैं। बोली दस्तावेजों को 100 डीपीएई के साथ काले और सफेद विकल्प स्कैन किया जा सकता है।
4) 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” 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.

SUBMISSION OF BIDS/बोली (बिड) का जमा करना

1) Bidder should log into the site well in advance for bid submission so that he/she 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.

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

3) Bidder has to select the payment option as “on-line” to pay the tender fee / EMD as applicable and enter details of the instrument. Whenever, EMD / Tender fees is sought, bidders need to pay the tender fee and EMD separately on-line through RTGS (Refer to Schedule, Page No.2).

4) A standard BoQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. 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.

5) 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.
6) 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.

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

8) Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

9) Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet.

ASSISTANCE TO BIDDERS /बोलीदाताओं की सहायता

1) 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.

2) 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. The contact number for the helpdesk is 1800 233 7315.

General Instructions to the Bidders /बोलीदाताओं के लिए सामान्य निर्देश

1) The tenders will be received online through portal http://eprocure.gov.in/eprocure/app . In the Technical Bids, the bidders are required to upload all the documents in .pdf format.

2) Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company’s name is a prerequisite for registration and participating in the bid submission activities through https://eprocure.gov.in/eprocure/app. Digital Signature Certificates can be obtained
from the authorized certifying agencies, details of which are available in the web site https://eprocure.gov.in/eprocure/app under the link “Information about DSC”.

3) Tenderer are advised to follow the instructions provided in the ‘Instructions to the Tendererfor the e-submission of the bids online through the Central Public Procurement Portal for e Procurement at https://eprocure.gov.in/eprocure/app.

निविदकों को सलाह दी जाती है कि वे निविदक को निर्देश दिए गए हों ताकि ई-प्रोक्रेमेंट के लिए सेंट्रल पब्लिक प्रोक्रेमेंट पोर्टल के जरिए https://eprocure.gov.in/eprocure/app पर ऑनलाइन निविदाएं जमा कर सकें।
NOTICE INVITING QUOTATIONS

Subject : Tender Motion Analyzing System using Brain Computer Interface

Invitation for Tender Offers

Indian Institute of Technology Delhi invites online Bids (Technical bid and Commercial bid) from eligible and experienced OEM (Original Equipment Manufacturer) OR OEM Authorized Dealer for supply, installation & integration of motion analyzing system using brain computer interface with (warranty period as stated at page #1 of this tender) on site comprehensive warranty from the date of receipt of the material as per terms & conditions specified in the tender document, which is available on CPP Portal http://eprocure.gov.in/eprocure/app

TECHNICAL SPECIFICATION:

Interested bidder shall quote separately for part (S.No 1 & 2). Combined price for both S.No 1 & 2 shall not be considered and their tender will be considered “rejected”

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dual Belt Instrumented Treadmill solution with following components and features:</td>
<td>1 Set</td>
</tr>
<tr>
<td>1.A</td>
<td>Instrumented Treadmill Control Software: The basic GUI software for controlling the dual-belt Instrumented Treadmill.</td>
<td>1 No.</td>
</tr>
<tr>
<td>i.</td>
<td>The basic GUI should allow manually changing the speed, acceleration, direction of movement of each belt, and pitch and sway of the instrumented treadmill, dynamically.</td>
<td></td>
</tr>
<tr>
<td>ii.</td>
<td>The basic GUI should save raw GRF data (in voltages) as well as filtered GRF data (in Newtons) in .csv,.txt, .mat, .c3d or .xlsx formats on computer for later retrieval.</td>
<td></td>
</tr>
<tr>
<td>iii.</td>
<td>The instrumented treadmill should have the option to upgrade the software or be integrated through another GUI based software that can integrate 3D motion capture data, EEG data, EMG data, Metabolic cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>analyser data, and other force plate data.</strong></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>1.B</td>
<td><strong>Dual Belt Instrumented Treadmill:</strong></td>
<td>1 No.</td>
</tr>
<tr>
<td>i.</td>
<td>No. of Belts: 2 (each with independent control)</td>
<td></td>
</tr>
<tr>
<td>ii.</td>
<td>Walking Surface length: 2 m, or larger</td>
<td></td>
</tr>
<tr>
<td>iii.</td>
<td>Walking Surface width: 1 m (2 x 0.5 m), or wider</td>
<td></td>
</tr>
<tr>
<td>iv.</td>
<td>Handrails: Yes</td>
<td></td>
</tr>
<tr>
<td>v.</td>
<td>Treadmill speed: Standard: maximum speed of 18 km/h or higher upto 25 km/h (should allow rapid acceleration and deceleration)</td>
<td></td>
</tr>
<tr>
<td>vi.</td>
<td>Treadmill belts reverse mode: Allowing treadmill belts to run in the opposite direction speed allowing for backward walking with maximum speed of 6 km/h or higher</td>
<td></td>
</tr>
<tr>
<td>vii.</td>
<td>Treadmill speed stepping: 0.01 m/s (or better)</td>
<td></td>
</tr>
<tr>
<td>viii.</td>
<td>Treadmill acceleration: at least 3 m/s² - 15 m/s², or better</td>
<td></td>
</tr>
<tr>
<td>ix.</td>
<td>Number of Force plates: 2 (1 Force plate under each belt)</td>
<td></td>
</tr>
<tr>
<td>x.</td>
<td>Forceplate type: 6 Component (Fx, Fy, Fz, Mx, My, Mz) or better</td>
<td></td>
</tr>
<tr>
<td>xi.</td>
<td>Fx Load Capacity (sideways): 5 kN, or higher</td>
<td></td>
</tr>
<tr>
<td>xii.</td>
<td>Fz Load Capacity (vertical): 5 kN or higher</td>
<td></td>
</tr>
<tr>
<td>xiii.</td>
<td>Fy Load Capacity (running direction): 5 kN or higher</td>
<td></td>
</tr>
<tr>
<td>xiv</td>
<td>Center of Pressure Error: ≤ ±5 mm or better</td>
<td></td>
</tr>
<tr>
<td>xv</td>
<td>Instrumented Treadmill Power requirements: 400 VAC, 32A. 3-phase, female plug. Other normal power sockets for computers, Monitors etc..</td>
<td></td>
</tr>
<tr>
<td>xvi</td>
<td>Degrees of Freedom: 2 or more</td>
<td></td>
</tr>
<tr>
<td>xvii</td>
<td>Dynamic Pitch: +/- 10°. It should be possible to change pitch during experiments.</td>
<td></td>
</tr>
<tr>
<td>xviii</td>
<td>Dynamic Sway: +/- 5 cm. It should be possible to apply sway perturbations under dynamic conditions, during experiments.</td>
<td></td>
</tr>
<tr>
<td>1.C</td>
<td><strong>Optical passive marker IR Camera technology based 3D Motion Capture</strong></td>
<td>1 No.</td>
</tr>
</tbody>
</table>
**System**: Integrated and synchronized 3D Motion capture System for full body tracking of the subject, to generate full body kinematics and dynamics model in real-time in a tight feedback-control loop, as well as for post-analysis.

<table>
<thead>
<tr>
<th>i.</th>
<th>No. of Cameras: 10 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>ii.</td>
<td>Camera resolution: 1.3 Mega-pixel or higher</td>
</tr>
<tr>
<td>iii.</td>
<td>Maximum Frame Rate: 250 Hz or better</td>
</tr>
</tbody>
</table>
| iv. | Sync Hardware: Motion capture system supported dedicated Hardware for hardware based time synchronization of third party systems, with  
  - atleast 64 Analog inputs for interfacing with 3rd party Hardwares with Analog outputs,  
  - trigger start/stop,  
  - digital synch in/out etc., or better for interfacing analog outputs from both Force Platforms and flexible digital/Trigger Inputs/Outputs for time synchronization with third party hardwares like EMG, EEG, fNIRS, Eye Trackers.  
  - Should be able to synchronize or integrate Metabolic Analysis System. |
| v. | Markers:  
  - Atleast 200 no.s of passive retro-reflective markers (8mm -12mm)  
  - Should also include starting quantity of means of attaching the markers on body segments, like double sided adhesive tapes, hook and loop Velcro pads etc.. |
| vi. | Motion Capture Computer: Dedicated Server hardware for Motion Capture.  
  ≥ Windows 10 64 bit, Quad Core Intel Xeon,  
  ≥ 8GB RAM  
  ≥ 240GB SSD hard disk,  
  ≥ nVidia Quadro P620 Graphics card |
| vii. | Motion Capture System Software should compulsorily allow synchronized data collection (an integration wherever possible) from:  
  - 3D Motion Capture System  
  - Ground reaction force (GRF) data from Force Platforms in Instrumented Treadmill  
  - other third party hardwares, like any EMG System, that can output EMG data as Analog outputs,  
  - any other hardware with Analog outputs |
through compatible Data Acquisition System in a single file.

| vii. | Motion Capture System Software should also allow digital triggers in/out for simultaneous start of data collection of different hardwares, and continuous synch pulse inputs and outputs to/from third party hardwares for common time base marking of data streams with respect to external hardware’s clocks for pulse by pulse synchronization. |
| ix. | Motion Capture System’s Accessories: Sufficient no. and type of compatible power and data cabling, lenses, camera mounts, Tripods etc. for satisfactory installation of Motion Capture System according to the site, for an excellent coverage of the full body of human walking on the Instrumented treadmill, with no, or little, occlusion of markers. |

1.D **GENERAL:**

i. 1. Safety and fall protection systems:
   2. The safety system should include various active systems to ensure shutdown in case of emergency.
   3. The fall protection system should consist of a safety harness and safety line, to be mounted to the ceiling, to arrest a fall in the event of balance loss.
   4. By default, two harnesses should be included: size 0 and size 2.
   5. Option of purchasing extra, different sizes of harnesses should be available.

ii. System should be CE marked, and preferably EN ISO 13485 certification

1.E **Metabolic Analysis System:** 1 Set

i. *Research Grade breath-by-breath metabolic analysis system with following technical specs. with 1 Year Warranty.*

ii. Life: ≥ 20 Years

iii. Maintenance requirements: Minimal

iv. **O2 Analyzer:**
   1. Response Time: ≤60 ms
   2. Rise Time 10 to 90%: ≤30ms
   3. Measuring Range: 0 to 100%
   4. Linearity: ≤0.1%
   5. Resolution: ≤0.02%
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|  | 6. Precision: ≤1% relative  
Stability: ≤0.05% per day |
| v. | CO2 Analyzer:  
1. Response Time: ≤60 ms  
2. Rise Time 10 to 90%: ≤30ms  
3. Measuring Range: 0 to 15%  
4. Linearity: ≤0.1%  
5. Resolution: ≤0.02%  
6. Precision: ≤1% relative  
7. Stability: ≤0.05% per day |
| vi. | Pneumotechnograph:  
1. Range: 0 to 800 Litres/minute  
2. Bandwidth: 600 Hz  
3. Precision: ≤1%  
4. Linearity: ≤0.1% |
| vii. | Analog Inputs (user configurable voltage range): 4, or better, for Analog inputs time and also for synch pulse recording from 3rd party hardwares for time synchronization. |
| viii. | A. Analog outputs: Raw sensor Analog data outputs of O2, Co2 and Flow sensors. |
| ix. | ECG: Should include ECG sensor |
| x. | Software features:  
1. The following parameters should be measured during metabolic exercise test with Metabolic Analysis System for all 3 phases of a metabolic test: Rest, Exercise and Recovery. All parameters including Resting Energy Expenditure should be computed throughout the whole test.:  
2. FiO2, FiCO2, Vt, FeO2, FeCO2, FETO2, FETCO2, Heart Rate, ST segment, SAP, DAP  
3. The following variables should then computed: Breathing Rate, Vebtps, VO2 (l/min), VO2/kg, Respiratory Ratio, VCO2, O2Pulse, Gross Efficiency, Half Recovery Time and HR, Metabolic Rate, METS, PETO2, PETCO2, RO2, RECO2, Ventilatory Reserve, Cardiac Reserve, DVO2/DW, Cardiac Response, TRUEO2, Vd/Vt, FVC, Caloric Equivalent, REE, Cardiac Output and Cardiac Stroke.  
4. It should be possible to perform Flow Volume Curves during a test to detect hyperinflation subjects.  
5. It should be possible to run Spirometry and Cardiac Stress test stand-alone, independently and together with Metabolic Exercise Test too.  
6. It should be possible for results editing and data export in tabular and graphical interactive
| xi. | Integration and Synchronization: Metabolic Analysis System should save data in ASCII Text format with external synch markers at a certain frequency at it’s Analog input, for time synchronization with third party equipments for post-processing analysis. |
| xii. | A. Should include Cart, 2 Monitors, starting set of consumables like complete mask and a supplementary set of face piece, headgear and adapter, Protection filters, Spirometry filters, sampling line, calibration tank equipped with a double chamber pressure regulator. |

### 2. A. MOBILE WIRELESS EEG SYSTEM WITH SALINE ELECTRODES

1. Should be a minimum 32 channel EEG system, Ultra lightweight for mobile applications.
2. Should offer Wireless transmission of data and should be capable of storing data internally on SD-Card and/or hard disk.
3. Should be offered with a saline Based sensor cap with 32 pieces of electrodes.
4. Should be expandable to 64 channels of EEG System, with 8 Auxiliary channels and 8 BIT Trigger for peripheral signal recording.
5. Should have Built-in TTL Trigger input.
6. Should be able to store data on an exchangeable SD-Card and hard disk.
7. System should be able to integrate with third party devices like research EMG devices, motion tracking etc.
8. Should be compatible with all the electrode types: passive, active, active dry and Water Based Net Cap.
9. Electrodes should be supplied with 32 pcs of high-quality Ag/AgCl sensors with a wide port to apply Gel. Caps should be offered with exchangeable sponge tips. Should include consumables to continue the recordings for 15-30 mins.
10. Each electrode should have a built in adjustable bands to mould the cap for better comfort and fit to various head shapes.
11. Each electrode should have a port to refill saline water if any electrode becomes dry.
12. Users should be able to repair electrodes themselves at site without the need of replacing the whole caps.

13. Cap should be based on the international 10-20 positioning system.

14. Should be European CE certified.

15. Features:
   a. Sampling rate: 1000 Hz
   b. Wireless transmission range: up to 10 m indoors and up to 30 m outdoors
   c. A/D conversion: 24 bit
   d. Operating range: +/- 341.6 mV
   e. Resolution: Approx. 40.7 nV / bit
   f. Noise: less than 2 µV pp from 0.01 Hz - 65 Hz
   g. CMRR: more than 80 dB at 50/60 Hz
   h. Should have Built-in 3-axis accelerometer
   i. Should have Uninterrupted recording time: up to 3.5 h with internal battery (extendable via power bank)
   j. Weight: less than 60 grams

16. Should be offered with Windows based Recording Software, should have wizard-based workspaces for various research requirements and protocols. Menu structure to guide the user with all crucial steps for setting up the hardware/software filter configuration, selecting the hardware filters on a channel-by-channel basis from the same manufacturer.
   a. Data Recording Software- Recording Software should be able to record and process the data acquired from electrodes and auxiliary sensors with the below features.
   b. The recording software should be from the same manufacturer as the amplifier to ensure maximum compatibility and a better sampling rate. Open source or universal processing software like Matlab or toolboxes will not be accepted.
   c. The selection of hardware filters on a channel-by-channel basis should be easy and fast. The acquired data should be displayed in multiple ways and the channel montages (original, bipolar and average) to be made switchable on the fly, to adjust the channel view to the specific experiment needs.
d. It should be able to check the channel by channel impedance value should be displayed with a fully selectable color coding.

e. It should be able to perform a complete evoked potential analysis in real-time directly and the segmented/averaged data should be stored together with the raw data.

f. It should be compatible to send out the incoming data to the network via the TCP/IP protocol using the Remote Data Access module for real-time data analyses.

g. Should be able to do Online Average Overlay-allows you to add a static overlay of a previously recorded average to the average view and thus compare the ongoing wave with a prototypical one.

h. Should offer the selection of Default Display Interval i.e to select the length of the time interval to be displayed by default on the computer screen.

i. Should offer to select a subset of channels during monitoring.

j. Should offer Interface to the active electrode control software, should be able to automatically save the impedance values in the header file of EEG data and should not need a separate file to save them.

k. Acquisition software should be able to transfer the data to the other Programs like MATLAB and Python, located on the local computer or on computers in the network.

l. BCI Applications Should have Provision for scripting and developing user defined analysis for BCI tools along with Data exporting.

m. The data scripting should be enabled where the user can script own code for special purpose applications along with the export facility to load into any other analysis tools should be available.

17. Data Streaming-The system should be able to stream the online recorded data with user specified filters, and segmentation over a TCP/IP protocol to the computer network of
18. Must quote (door delivery) price for 3 year warranty and support

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<tr>
<th>2B</th>
<th>26 CHANNEL WIRELESS EMG SYSTEM</th>
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1. System should be offered with 26 wireless sensors, each channel should have a Built-in IMU to upgrade our existing Noraxon EMG system. Each Sensor unit should be compatible with our existing EMG device.

2. Should be shielded lead based sensors and not just the contact points. The whole sensor has to be in touch with the muscle to be measured. Should offer no movement artefacts in the EMG data.

3. The wireless EMG sensors should be able to charge and communicate using the existing charging cradle.

4. Sensors should have shielded EMG leads.

5. Should be able to record from prosthesis by modifying the lead length without drilling holes in the prosthesis.

6. Should be able to work with extensions for the existing sensor for collecting EMG, ECG, respiration, Linear Force, Footswitch, Goniometer, Insoles, biomonitor, accelerometer etc.

7. Should be able to sync with any standard research equipment by sending TTL triggers including EEG data, and camera for tracking so that everything is recorded in Sync.

8. Electrode Impedance Test: Integrated into sensors

9. EMG Sensor Dimensions - Weight: 25 grams or less.

10. Each sensor unit should have a multi-colored LED to indicate battery or functional status and identification of the sensor unit.

11. EMG System should offer 24 bit resolution with sampling rate upto 4,000 Hz and
following features:

a. ± 24,000 µV EMG input range
b. Input Impedance > 1,000 MOhm
c. Resolution (5,000 To 24,000uv) :1.1uv
d. High Pass Filters :Upto 20hz
e. Low Pass Filters :Upto 1500hz
f. EMG Baseline Noise: <1µv
g. Integrated 16g accelerometer
h. CMRR < -100dB

12. Each EMG sensor unit should have a multi-colored LED to indicate battery or functional status and identification of the sensor unit.

13. Internal Memory >8 Hours Of Data Storage.

14. System should be offered with an extension receiver unit and three charging stations, each with a capacity to hold 9 sensors of both EMG/IMU at the same time.

15. The sensors should be sweat resistant.

16. Data transmission should be wireless (from sensors to receiving unit).

17. EMG signal receiving unit range at least 30 meters.

18. On board solid state buffer memory system for lossless data recording, even when the sensor is out of range of the receiving unit.

19. Weight <20 grams including battery.

20. Should have synchronization trigger input and output in the Receiver unit.

21. Receivers should have the option to output analog data up to 32 channels.

22. Must quote (door delivery) price for 3 year warranty and support

3

| 3A | myoMUSCLE Software to allow display and | 1Set |
recording of data from EMG and motion tracking on the same interface and can even overlay data. Software to measure and record acceleration, angular velocity, and magnetic field amplitude simultaneously with measurement sensors. Enable IMU data for individual sensors during measurement setup.

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<tr>
<td>3B</td>
<td>MyoSync should be provided which will enable to send TTL triggers to sync other third party devices including EEG recording system, and motion capture system.</td>
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<tr>
<td>3C</td>
<td>2 or more optical passive marker IR cameras for full body tracking of the subject, to generate full body kinematics and dynamics model in real-time in a tight feedback-control loop, as well as for post-analysis. Camera resolution: 1.3 Mega-pixel or higher.</td>
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<tr>
<td>3D</td>
<td>4 or more EMG sensors which should be shielded lead based sensors and not just the contact points. The whole sensor has to be in touch with the muscle to be measured.</td>
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<tr>
<td>3E</td>
<td>Must quote price for 2 year extended warranty and support</td>
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</table>

A complete set of tender documents* may be Download by prospective bidder free of cost from the website [http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app). Bidder has to make payment of requisite fees (i.e. Tender fees (if any) and EMD) online through RTGS/NEFT only.
### Terms & Conditions Details

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<th>Sl.No.</th>
<th>Specification</th>
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<td>1.</td>
<td><strong>Due date:</strong> The tender has to be submitted on-line before the due date. The offers received after the due date and time will not be considered. No manual bids will be considered.</td>
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| 2.     | **Preparation of Bids:** The offer/bid should be submitted in two bid systems (i.e.) Technical bid and financial bid. The technical bid should consist of all technical details along with commercial terms and conditions. Financial bid should indicate item wise price for the items mentioned in the technical bid in the given format i.e.BoQ XXXX. The Technical bid and the financial bid should be submitted Online.  
*Note: Comparison of prices will be done ONLY on the bids submitted for the Main Equipment and anything asked as ‘Optional’ in the specs is not to be included for overall comparison.* |
| 3.     | **EMD (if applicable):** The tenderer should submit an EMD amount through RTGS/NEFT. The Technical Bid without EMD would be considered as UNRESPONSIVE and will not be accepted. The EMD will be refunded without any interest to the unsuccessful bidders after the award of contract. Refer to Schedule (at page 1 of this document) for its actual place of submission. |
| 4.     | **Refund of EMD:** The EMD will be returned to unsuccessful Tenderer only after the Tenders are finalized. In case of successful Tenderer, it will be retained till the successful and complete installation of the equipment. |
| 5.     | **Opening of the tender:** The online bid will be opened by a committee duly constituted for this purpose. Online bids (complete in all respect) received along with EMD (if any) will be opened as mentioned at “Annexure: Schedule” in presence of bidders representative if available. Only one representative will be allowed to participate in the tender opening. Bid received without EMD (if present) will be rejected straight way. The technical bid will be opened online first and it will be examined by a technical committee (as per specification and requirement). The financial offer/bid will be opened only for the offer/bid which technically meets all requirements as per the specification, and will be opened in the presence of the vendor’s representatives subsequently for further evaluation. The bidders if interested may participate on the tender opening Date and Time. The bidder should produce authorization letter from their company to participate in the tender opening. |
| 6.     | **Acceptance/ Rejection of bids:** The Committee reserves the right to reject any or all offers without assigning any reason. |
| 7.     | **Pre-qualification criteria:**  
(i) Bidders should be the manufacturer / authorized dealer. Letter of Authorization from original equipment manufacturer (OEM) on the same and specific to the tender should be enclosed.  
(ii) An undertaking from the OEM is required stating that they would facilitate the bidder on a regular basis with technology/product updates and extend support for the warranty as well. (Ref. Annexure-II)  
(iii) OEM should be internationally reputed Branded Company.  
(iv) Non-compliance of tender terms, non-submission of required documents, lack of clarity of the specifications, contradiction between bidder specification and supporting documents etc. may lead to rejection of the bid.  
(v) In the tender, either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender.  
(vi) If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product. |
| 8.     | **Performance Security:** The supplier shall require to submit the performance security in the form of irrevocable bank guarantee issued by any Indian Nationalized Bank/ Foreign Bank (if local representative is not involved) for an amount which is stated at page #1 of the tender document within 21 days from the date of receipt of the purchase order/LC and should be kept valid for a
period of 60 days beyond the date of completion of warranty period.

9. **Force Majeure:** The Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, it’s delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

- For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. SUCH events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.
- If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

10. **Risk Purchase Clause:** In event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from the other source on the total risk of the supplier under risk purchase clause.

11. **Packing Instructions:** Each package will be marked on three sides with proper paint/indelible ink, the following:
   - i. Item Nomenclature
   - ii. Order/Contract No.
   - iii. Country of Origin of Goods
   - iv. Supplier’s Name and Address
   - v. Consignee details
   - vi. Packing list reference number

12. **Delivery and Documents:**
    Delivery of the goods should be made within a maximum of 16 weeks (for goods ready for shipment) & Maximum (To be filled by Purchaser) weeks (For special/ to be fabricated goods) from the date of the opening of LC. Within 24 hours of shipment, the supplier shall notify the purchaser and the insurance company by email the full details of the shipment including contract number, railway receipt number/ AAP etc. and date, description of goods, quantity, name of the consignee, invoice etc. The supplier shall mail the following documents to the purchaser with a copy to the insurance company:
    1. 4 Copies of the Supplier invoice showing contract number, goods’ description, quantity
    2. unit price, total amount;
    3. Insurance Certificate if applicable;
    4. Manufacturer’s/Supplier’s warranty certificate;
    5. Inspection Certificate issued by the nominated inspection agency, if any
    6. Supplier’s factory inspection report; and
    7. Certificate of Origin (if possible, by the beneficiary);
    8. Two copies of the packing list identifying the contents of each package.
    9. The above documents should be received by the Purchaser before arrival of the Goods (except where the Goods have been delivered directly to the Consignee with all documents) and, if not received, the Supplier will be responsible for any consequent expenses.

13. **Delayed delivery:** If the delivery is not made within the due date for any reason, the Committee will have the right to impose penalty 1% per week and the maximum deduction is 10% of the contract value/ price.

14. **Prices:** The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges. The offer/bid should be exclusive of taxes and duties, which will be paid by the purchaser as applicable. However, the percentage of taxes & duties shall be clearly indicated. The price should be quoted without custom duty and excise duty, since IIT Delhi is exempted from
payment of Excise Duty and is eligible for concessional rate of custom duty. Necessary certificate will be issued on demand.

**IN CASE OF IMPORTS, THE PRICE SHOULD BE QUOTED ON FOB/FCA ORIGIN AIRPORT BASIS ONLY.** Under special circumstances (only perishable chemicals), when the item is imported on CIF/CIP, please indicate CIF/CIP charges separately up to IIT Delhi indicating the mode of shipment. IIT Delhi will make necessary arrangements for the clearance of imported goods at the Airport/Seaport. Hence the price should not include the above charges. **At any circumstances, it is the responsibility of the foreign supplier to handover the material to our nominated forwarder at the origin airport after completing all the inland clearing.**

In case of CIF/CIP, shipment information must be provided at **least 2 days in advance** before the landing of shipment along with the documents i.e. invoice, packing list, forwarder Name, address, contact No. in India to save penalty/demurrage charges (imposed by Indian Customs), failing which, these charges will be recovered from the supplier/Indian Agent. To avoid the penalty/demurrage charges due to late filing of Bill of Entry, it is advisable to handover the shipment to the Freight forwarder nominated by the Logistic Agent contracted by IITD.

*Note: Comparison of prices will be done ONLY on the bids submitted for the Main Equipment and anything asked as ‘Optional’ in the specs is not to be included for overall comparison.*

### 15. Evaluation of Price/Financial Bid:

For the bids surviving the technical evaluation which have been found to be responsive the evaluation & comparison shall be made as under:

1. **If the response to the tender consists only of Indigenous Offers**
   
   (i) The final landing cost of purchase after all discounts, freight, forwarding, insurance, taxes etc. shall be the basis of evaluation.
   
   (ii) In the case of goods manufactured in India or goods of foreign origin already located in India, GST and excise duty (if applicable) and other similar taxes and duties, which will be contractually payable (to the tenderer) on the goods are to be added and will be considered in determination of evaluation criteria for L-1 in those cases where only Indian bidders are competing.

2. **If the response to the tender consists only of Imported Offers**
   
   (i) The FOB/FCA price shall be the basis of evaluation. **Please make sure that your Price Bid mentions FOB/FCA prices clearly and not just CIF/CIP prices directly OTHERWISE for the purpose of comparison such CIF/CIP price will be taken into account.**
   
   (ii) In cases where all the offers are from foreign suppliers, ranking will be assessed on FOB/FCA basis. In the case of goods of foreign origin offered from abroad, customs duty and other similar import duties/taxes, which will be contractually payable (to the tenderer) on the goods, are to be added;
   
   (iii) All the foreign quotes will be brought to a common denomination in Indian Rupees by adopting the Selling exchange rate of the RBI/State Bank of India on the date of the opening of Price/financial Bids.

3. **If the response to the tender consists of Imported as well as Indigenous Offers**
   
   (i) The comparison between the indigenous and the foreign offers shall be made on the final
landing cost of purchase taking into account, freight, forwarding, insurance, taxes etc. as specified in clause 1(i) and (ii) and for bids in foreign currency as per clause 2 (i), (ii) & (iii) Further, adding advalorem/custom duty/countervailing duty (as applicable) at the rate of 9.34% on price quoted on FOB/FCA term including cost for safe Unloading and all other costs for all activities as per scope of work basis. IIT Delhi will submit Custom Duty Exemption Certificate under clause no.51/96.

(ii) iGST @ 18% of shipment value & Custom Duty

16. **Notices:** For the purpose of all notices, the following shall be the address of the Purchaser and Supplier.
   **Purchaser:** Dr. Sitikantha Roy, Professor  
   Department of Applied Mechanics & School of Artificial Intelligence  
   Block IV Room 243  
   Indian Institute of Technology, Delhi  
   Hauz Khas, New Delhi - 110016.

   **Supplier:** (To be filled in by the supplier)
   *(All suppliers should submit its supplies information as per Annexure-II).*

17. **Progress of Supply:** Wherever applicable, supplier shall regularly intimate progress of supply, in writing, to the Purchaser as under:
   1. Quantity offered for inspection and date;
   2. Quantity accepted/rejected by inspecting agency and date;
   3. Quantity dispatched/delivered to consignees and date;
   4. Quantity where incidental services have been satisfactorily completed with date;
   5. Quantity where rectification/repair/replacement effected/completed on receipt of any communication from consignee/Purchaser with date;
   6. Date of completion of entire Contract including incidental services, if any; and
   7. Date of receipt of entire payments under the Contract (In case of stage-wise inspection, details required may also be specified).

18. **Inspection and Tests:** Inspection and tests prior to shipment of Goods and at final acceptance are as follows:
   - After the goods are manufactured and assembled, inspection and testing of the goods shall be carried out at the supplier’s plant by the supplier, prior to shipment to check whether the goods are in conformity with the technical specifications attached to the purchase order. Manufacturer’s test certificate with data sheet shall be issued to this effect and submitted along with the delivery documents. The purchaser shall be present at the supplier’s premises during such inspection and testing if need is felt. The location where the inspection is required to be conducted should be clearly indicated. The supplier shall inform the purchaser about the site preparation, if any, needed for installation of the goods at the purchaser’s site at the time of submission of order acceptance.
   - The acceptance test will be conducted by the Purchaser, their consultant or other such person nominated by the Purchaser at its option after the equipment is installed at purchaser’s site in the presence of supplier’s representatives. The acceptance will involve trouble free operation and ascertaining conformity with the ordered specifications and quality. There shall not be any additional charges for carrying out acceptance test. No malfunction, partial or complete failure of any part of the equipment is expected to occur. The Supplier shall maintain necessary log in respect of the result of the test to establish to the entire satisfaction of the Purchaser, the successful
• In the event of the ordered item failing to pass the acceptance test, a period not exceeding one week will be given to rectify the defects and clear the acceptance test, failing which the Purchaser reserve the right to get the equipment replaced by the Supplier at no extra cost to the Purchaser.
• Successful conduct and conclusion of the acceptance test for the installed goods and equipment shall also be the responsibility and at the cost of the Supplier.

19. **Resolution of Disputes**: The dispute resolution mechanism to be applied pursuant shall be as follows:

- In case of Dispute or difference arising between the Purchaser and a domestic supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996, the rules there under and any statutory modifications or re-enactments thereof shall apply to the arbitration proceedings. The dispute shall be referred to the Director, Indian Institute of Technology (IIT) Delhi and if he is unable or unwilling to act, to the sole arbitration of some other person appointed by him willing to act as such Arbitrator. The award of the arbitrator so appointed shall be final, conclusive and binding on all parties to this order.
- In the case of a dispute between the purchaser and a Foreign Supplier, the dispute shall be settled by arbitration in accordance with provision of sub-clause (a) above. But if this is not acceptable to the supplier then the dispute shall be settled in accordance with provisions of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules.
- The venue of the arbitration shall be the place from where the order is issued.

20. **Applicable Law**: The place of jurisdiction would be New Delhi (Delhi) INDIA.

21. **Right to Use Defective Goods**
If after delivery, acceptance and installation and within the guarantee and warranty period, the operation or use of the goods proves to be unsatisfactory, the Purchaser shall have the right to continue to operate or use such goods until rectifications of defects, errors or omissions by repair or by partial or complete replacement is made without interfering with the Purchaser’s operation.

22. **Supplier Integrity**
The Supplier is responsible for and obliged to conduct all contracted activities in accordance with the Contract using state of the art methods and economic principles and exercising all means available to achieve the performance specified in the contract.

23. **Training**
The Supplier is required to provide training to the designated Purchaser’s technical and end user personnel to enable them to effectively operate the total equipment.

24. **Installation & Demonstration**
The supplier is required to done the installation and demonstration of the equipment within one month of the arrival of materials at the IITD site of installation, otherwise the penalty clause will be the same as per the supply of materials.

In case of any mishappening/damage to equipment and supplies during the carriage of supplies from the origin of equipment to the installation site, the supplier has to replace it with new equipment/supplies immediately at his own risk. Supplier will settle his claim with the insurance company as per his convenience. IITD will not be liable to any type of losses in any form.

25. **Insurance**: For delivery of goods at the purchaser’s premises, the insurance shall be obtained by the supplier in an amount equal to 110% of the value of the goods from "warehouse to warehouse" (final destinations) on “All Risks" basis including War Risks and Strikes. The insurance shall be valid for a period of not less than 3 months after installation and commissioning. **In case of orders placed on FOB/FCA/ExW basis, the purchaser shall arrange Insurance. If orders placed on CIF/CIP basis, the insurance should be up to IIT Delhi.**

26. **Incidental services**: The incidental services also include:
• Furnishing of 01 set of detailed operations & maintenance manual.
• Arranging the shifting/moving of the item to their location of final installation within IITD premises at the cost of Supplier through their Indian representatives.

27. Warranty:
(i) Warranty period shall be (as stated at page #2 of this tender) from date of installation of Goods at the IITD site of installation. The Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the contract. If for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the Supplier shall at its discretion make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expense and to carry out further performance tests. The warranty should be comprehensive on site.
(ii) The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall immediately within in 02 days arrange to repair or replace the defective goods or parts thereof free of cost at the ultimate destination. The Supplier shall take over the replaced parts/goods at the time of their replacement. No claim whatsoever shall lie on the Purchaser for the replaced parts/goods thereafter. The period for correction of defects in the warranty period is 02 days. If the supplier having been notified fails to remedy the defects within 02 days, the purchaser may proceed to take such remedial action as may be necessary, at the supplier’s risk and expenses and without prejudice to any other rights, which the purchaser may have against the supplier under the contract.
(iii) The warranty period should be clearly mentioned. The maintenance charges (AMC) under different schemes after the expiry of the warranty should also be mentioned. The comprehensive warranty will commence from the date of the satisfactory installation/commissioning of the equipment against the defect of any manufacturing, workmanship and poor quality of the components.
(iv) After the warranty period is over, Annual Maintenance Contract (AMC)/Comprehensive Maintenance Contract (CMC) up to next two years should be started. The AMC/CMC charges will not be included in computing the total cost of the equipment.

28. Governing Language
The contract shall be written in English language. English language version of the Contract shall govern its interpretation. All correspondence and other documents pertaining to the Contract, which are exchanged by the parties, shall be written in the same language.

29. Applicable Law
The Contract shall be interpreted in accordance with the laws of the Union of India and all disputes shall be subject to place of jurisdiction.

30. Notices
• Any notice given by one party to the other pursuant to this contract/order shall be sent to the other party in writing or by cable, telex, FAX or e-mail and confirmed in writing to the other party’s address.
• A notice shall be effective when delivered or on the notice’s effective date, whichever is later.

31. Taxes
Suppliers shall be entirely responsible for all taxes, duties, license fees, octroi, road permits, etc., incurred until delivery of the contracted Goods to the Purchaser. However, GST etc, in respect of the transaction between the Purchaser and the Supplier shall be payable extra, if so stipulated in the order.

32. Duties
IIT Delhi is exempted from paying custom duty under notification No.51/96 (partially or full) and necessary “Custom Duty Exemption Certificate” can be issued after providing following information
and Custom Duty Exemption Certificate will be issued to the shipment in the name of the Institute, (no certificate will be issued to third party): The procured product should be used for teaching, scientific and research work only.
a) Shipping details i.e. Master Airway Bill No. and House Airway No. (if exists)
b) Forwarder details i.e. Name, Contact No., etc.

33. **Agency Commission:** Agency commission if any will be paid to the Indian agent in Rupees on receipt of the equipment and after satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances. The details should be explicitly shown in Tender even in case of Nil commission. The tenderer should indicate the percentage of agency commission to be paid to the Indian agent.

34. **Payment:**
   (i) For imported items Payment will be made through irrevocable Letter of Credit (LC) Cash Against Documents (CAD)/Against delivery/after satisfactory installation by T.T. Letter of Credit (LC) will be established in favour of foreign Supplier after the submission of performance security. The letter of credit (LC) will be established on the exchange rates as applicable on the date of establishment. For Imports, LC will be opened for 100% FOB/CIF value. 80% of the LC amount shall be released on presentation of complete and clear shipping documents and 20% of the LC amount shall be released after the installation and demonstration of the equipment at the INST site of installation in faultless working condition for period of 60 days from the date of the satisfactory installation and subject to the production of unconditional performance bank guarantee as specified in Clause 8 of tender terms and conditions.
   (v) For Indigenous supplies, 100% payment shall be made by the Purchaser against delivery, inspection, successful installation, commissioning and acceptance of the equipment at IITD in good condition and to the entire satisfaction of the Purchaser and on production of unconditional performance bank guarantee as specified in Clause 9 of tender terms and conditions.
   (vi) Indian Agency commission (IAC), if any shall be paid after satisfactory installation & commissioning of the goods at the destination at the exchange rate prevailing on the date of negotiation of LC documents, subject to DGS&D registration for restricted items.
   (vii) All the bank charges within India will be borne by the Institute and outside India will be borne by the Supplier.

35. **User list:** Brochure detailing technical specifications and performance, list of industrial and educational establishments where the items enquired have been supplied must be provided. (Ref. Annexure-III)

36. **Manuals and Drawings**
   (i) Before the goods and equipment are taken over by the Purchaser, the Supplier shall supply operation and maintenance manuals. These shall be in such details as will enable the Purchaser to operate, maintain, adjust and repair all parts of the works as stated in the specifications.
   (ii) The Manuals shall be in the ruling language (English) in such form and numbers as stated in the contract.
   (iii) Unless and otherwise agreed, the goods equipment shall not be considered to be completed for the purposes of taking over until such manuals and drawing have been supplied to the Purchaser.

37. **Application Specialist:** The Tenderer should mention in the Techno-Commercial bid the availability and names of Application Specialist and Service Engineers in the nearest regional office. (Ref. to Annexure-III)

38. **Site Preparation:** The supplier shall inform to the Institute about the site preparation, if any, needed for the installation of equipment, immediately after the receipt of the purchase order. The supplier must provide complete details regarding space and all the other infrastructural requirements needed for the equipment, which the Institute should arrange before the arrival of the equipment to ensure
its timely installation and smooth operation thereafter. The supplier shall visit the Institute and see the site where the equipment is to be installed and may offer his advice and render assistance to the Institute in the preparation of the site and other pre-installation requirements.

39. **Spare Parts**
The Supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier:
- ii. Such spare parts as the Purchaser may elect to purchase from the Supplier, providing that this election shall not relieve the Supplier of any warranty obligations under the Contract; and
- iii. In the event of termination of production of the spare parts:
- iv. Advance notification to the Purchaser of the pending termination, in sufficient time to permit the Purchaser to procure needed requirements; and
- v. Following such termination, furnishing at no cost to the Purchaser, the blueprints, drawings and specifications of the spare parts, if requested.
Supplier shall carry sufficient inventories to assure ex-stock supply of consumable spares for the Goods, such as gaskets, plugs, washers, belts etc. Other spare parts and components shall be supplied as promptly as possible but in any case within six months of placement of order.

40. **Defective Equipment**: If any of the equipment supplied by the Tenderer is found to be substandard, refurbished, un-merchantable or not in accordance with the description/specification or otherwise faulty, the committee will have the right to reject the equipment or its part. The prices of such equipment shall be refunded by the Tenderer with 18% interest if such payments for such equipment have already been made. All damaged or unapproved goods shall be returned at suppliers cost and risk and the incidental expenses incurred thereon shall be recovered from the supplier. Defective part in equipment, if found before installation and/or during warranty period, shall be replaced within 45 days on receipt of the intimation from this office at the cost and risk of supplier including all other charges. In case supplier fails to replace above item as per above terms & conditions, IIT Delhi may consider "Banning" the supplier.

41. **Termination for Default**
The Purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, terminate the Contract in whole or part:
- i. If the Supplier fails to deliver any or all of the Goods within the period(s) specified in the order, or within any extension thereof granted by the Purchaser; or
- ii. If the Supplier fails to perform any other obligation(s) under the Contract.
- iii. If the Supplier, in the judgment of the Purchaser has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

- For the purpose of this Clause:
  - i. “Corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.
  - ii. “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition;”

- In the event the Purchaser terminates the Contract in whole or in part, the Purchaser may procure, upon such terms and in such manner, as it deems appropriate, Goods or Services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for such similar Goods or Services. However, the Supplier shall continue the performance of the Contract to the extent not terminated.
| 42. | **Shifting**: After 1-2 years once our new Academic Block will be ready, the supplier has to shift and reinstall the instrument free of cost (if required). |
| 43. | **Downtime**: During the warranty period not more than 5% downtime will be permissible. For every day exceeding permissible downtime, penalty of 1/365 of the 5% FOB value will be imposed. Downtime will be counted from the date and time of the filing of complaint within the business hours. |
| 44. | **Training of Personnel**: The supplier shall be required to undertake to provide the technical training to the personnel involved in the use of the equipment at the Institute premises, immediately after completing the installation of the equipment for a minimum period of one week at the supplier’s cost. |
| 45. | **Disputes and Jurisdiction**: Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within New Delhi. |
| 46. | **Compliancy certificate**: This certificate must be provided indicating conformity to the technical specifications. (Annexure-I) |
| 47. | **As per Ministry of Finance, Deptt. of Expenditure, Public Procurement Division Order (Public Procurement No.1) issued from file No.6/18/2019-PPD dated 23rd July, 2020** regarding Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs) 2017, it is directed that any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority i.e. the Deptt. for Promotion of Industry and Internal Trade (DPIIT). The said order will not apply to bidders from those countries (even sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects (updated lists of the countries are given in the Ministry of External Affairs). |

“**Bidder**” (including the term ‘tenderer’, ‘consultant’ or ‘service provider’ in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participated in a procurement process.

“**Bidders from a country which shares a land border with India**” for the purpose of this Order means:

i. An entity incorporated, established or registered in such a country; or
ii. A subsidiary of an entity incorporated, established or registered in such a country; or
iii. An entity substantially controlled through entities incorporated, established or registered in such a country; or
iv. An entity whose **beneficial owner** is situated in such a country; or
v. An Indian (or other) agent of such an entity; or
vi. A natural person who is the citizen of such a country; or
vii. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

The **beneficial owner** for the purpose of above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person (s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercise control through other means.

Explanation-

a. “**Controlling ownership interest**” means ownership of or entitlement to more than twenty-five per cent of share or capital or profit of the company;
b. “Control” shall include the right to appoint majority of the directors or to control the management of policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

2. In case of a partnership firm, the beneficial owner is the natural person (s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person (s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

An agent is a person employed to do any act for another, or to represent another in dealings with the third person.

For Works contracts, including Turnkey contracts, the successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

A certificate shall be submitted by bidders in the tender documents regarding their compliance with the said order. If the certificate submitted by a bidder whose bid is accepted is found to be false, this would be a ground for immediate termination and further legal action in accordance with law. Annexure VI (For Goods/ Services contracts)/ Annexure VII (For Works contracts, including Turnkey contracts)
COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Technical Specifications for integrated Motion Analyzing System using Brain Computer Interface

An integrated Motion Analyzing System using Brain Computer Interface is required consisting of following components and respective quantities with 3 year Warranty, onsite installation and training:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>Compliance Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dual Belt Instrumented Treadmill solution with following components and features:</td>
<td>1 Set</td>
</tr>
<tr>
<td>1.A</td>
<td>Instrumented Treadmill Control Software:</td>
<td>1 No.</td>
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<tr>
<td></td>
<td>The basic GUI software for controlling the dual-belt Instrumented Treadmill.</td>
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<tr>
<td>i.</td>
<td>The basic GUI should allow manually changing the speed, acceleration, direction of movement of each belt, and pitch and sway of the instrumented treadmill, dynamically.</td>
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<tr>
<td>ii.</td>
<td>The basic GUI should save raw GRF data (in voltages) as well as filtered GRF data (in Newtons) in .csv,.txt,.mat,.c3d or .xlsx formats on computer for later retrieval.</td>
<td></td>
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<tr>
<td>iii.</td>
<td>The instrumented treadmill should have the option to upgrade the software or be integrated through another GUI based software that can integrate 3D motion capture data, EEG data, EMG data, Metabolic cost analyser data, and other force plate data.</td>
<td></td>
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<tr>
<td>i.</td>
<td><strong>No. of Belts:</strong> 2 (each with independent control)</td>
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<td>ii.</td>
<td><strong>Walking Surface length:</strong> 2 m, or larger</td>
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<td>iii.</td>
<td><strong>Walking Surface width:</strong> 1 m (2 x 0.5 m), or wider</td>
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<td>iv.</td>
<td><strong>Handrails:</strong> Yes</td>
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<td>v.</td>
<td><strong>Treadmill speed:</strong> Standard: maximum speed of 18 km/h or higher up to 25 km/h (should allow rapid acceleration and deceleration)</td>
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<tr>
<td>vi.</td>
<td><strong>Treadmill belts reverse mode:</strong> Allowing treadmill belts to run in the opposite direction speed allowing for backward walking with maximum speed of 6 km/h or higher</td>
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<tr>
<td>vii.</td>
<td><strong>Treadmill speed stepping:</strong> 0.01 m/s (or better)</td>
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<td>viii.</td>
<td><strong>Treadmill acceleration:</strong> At least 3 m/s² - 15 m/s², or better</td>
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<tr>
<td>ix.</td>
<td><strong>Number of Force plates:</strong> 2 (1 Force plate under each belt)</td>
<td></td>
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<tr>
<td>x.</td>
<td><strong>Forceplate type:</strong> 6 Component (Fx, Fy, Fz, Mx, My, Mz) or better</td>
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<tr>
<td>xi.</td>
<td><strong>Fx Load Capacity (sideways):</strong> 5 kN, or higher</td>
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<tr>
<td>xii.</td>
<td><strong>Fz Load Capacity (vertical):</strong> 5 kN or higher</td>
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<tr>
<td>xiii.</td>
<td><strong>Fy Load Capacity (running direction):</strong> 5 kN or higher</td>
<td></td>
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<tr>
<td>xiv</td>
<td><strong>Center of Pressure Error:</strong> ( \leq \pm 5 \text{ mm} ) or better</td>
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<tr>
<td>xv</td>
<td><strong>Instrumented Treadmill Power requirements:</strong> 400 VAC, 32A. 3-phase, female plug. Other normal power sockets for computers, Monitors etc..</td>
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<tr>
<td>xvi</td>
<td><strong>Degrees of Freedom:</strong> 2 or more</td>
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<tr>
<td>xvii</td>
<td><strong>Dynamic Pitch:</strong> +/- 10°. It should be possible to change pitch during experiments.</td>
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</tr>
<tr>
<td>xviii</td>
<td><strong>Dynamic Sway:</strong> +/- 5 cm. It should be possible to apply sway perturbations under dynamic conditions, during experiments.</td>
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</tr>
</tbody>
</table>
1.C  **Optical passive marker IR Camera technology based 3D Motion Capture System:** Integrated and synchronized 3D Motion capture System for full body tracking of the subject, to generate full body kinematics and dynamics model in real-time in a tight feedback-control loop, as well as for post-analysis.

1. No.

i. No. of Cameras: 10 or more

ii. Camera resolution: 1.3 Mega-pixel or higher

iii. Maximum Frame Rate: 250 Hz or better

iv. Sync Hardware: Motion capture system supported dedicated Hardware for hardware based time synchronization of third party systems, with
   - atleast 64 Analog inputs for interfacing with 3rd party Hardwares with Analog outputs,
   - trigger start/stop,
   - digital synch in/out etc., or better for interfacing analog outputs from both Force Platforms and flexible digital/Trigger Inputs/Outputs for time synchronization with third party hardwares like EMG, EEG, fNIRS, Eye Trackers.
   - Should be able to synchronize or integrate Metabolic Analysis System.

v. Markers:
   - Atleast 200 no.s of passive retro-reflective markers (8mm -12mm)
   - Should also include starting quantity of means of attaching the markers on body segments, like double sided adhesive tapes, hook and loop Velcro pads etc..

vi. **Motion Capture Computer:** Dedicated Server hardware for Motion Capture.
   - ≥ Windows 10 64 bit, Quad Core Intel Xeon,
   - ≥ 8GB RAM
   - ≥ 240GB SSD hard disk,
   - ≥ nVidia Quadro P620 Graphics card
### vii. Motion Capture System Software

Motion Capture System Software should compulsorily allow synchronized data collection (an integration wherever possible) from:

- 3D Motion Capture System
- Ground reaction force (GRF) data from Force Platforms in Instrumented Treadmill
- other third party hardwares, like any EMG System, that can output EMG data as Analog outputs,
- any other hardware with Analog outputs through compatible Data Acquisition System in a single file.

Motion Capture System Software should also allow digital triggers in/out for simultaneous start of data collection of different hardwares, and continuous synch pulse inputs and outputs to/from third party hardwares for common time base marking of data streams with respect to external hardware’s clocks for pulse by pulse synchronization.

### ix. Motion Capture System’s Accessories

Motion Capture System’s Accessories: Sufficient no. and type of compatible power and data cabling, lenses, camera mounts, Tripods etc. for satisfactory installation of Motion Capture System according to the site, for an excellent coverage of the full body of human walking on the Instrumented treadmill, with no, or little, occlusion of markers.

### 1.D GENERAL:

#### i.

6. Safety and fall protection systems:
   7. The safety system should include various active systems to ensure shutdown in case of emergency.
   8. The fall protection system should consist of a safety harness and safety line, to be mounted to the ceiling, to arrest a fall in the event of balance loss.
   9. By default, two harnesses should be included: size 0 and size 2.
   10. Option of purchasing extra, different sizes of harnesses should be available.

#### ii.

System should be CE marked, and
preferably EN ISO 13485 certification

<table>
<thead>
<tr>
<th>1.E</th>
<th><strong>Metabolic Analysis System:</strong></th>
<th>1 Set</th>
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<tbody>
<tr>
<td>i.</td>
<td>Research Grade breath-by-breath metabolic analysis system with following technical specs. with 1 Year Warranty.</td>
<td></td>
</tr>
<tr>
<td>ii.</td>
<td>Life: ≥ 20 Years</td>
<td></td>
</tr>
<tr>
<td>iii.</td>
<td>Maintenance requirements: Minimal</td>
<td></td>
</tr>
</tbody>
</table>
| iv. | O2 Analyzer:  
  7. Response Time: ≤60 ms  
  8. Rise Time 10 to 90%: ≤30ms  
  9. Measuring Range: 0 to 100%  
 10. Linearity: ≤0.1%  
11. Resolution: ≤0.02%  
12. Precision: ≤1% relative  
13. Stability: ≤0.05% per day |
| v.  | CO2 Analyzer:  
  8. Response Time: ≤60 ms  
  9. Rise Time 10 to 90%: ≤30ms  
 10. Measuring Range: 0 to 15%  
11. Linearity: ≤0.1%  
12. Resolution: ≤0.02%  
13. Precision: ≤1% relative  
14. Stability: ≤0.05% per day |
| vi. | Pneumotechnograph:  
  5. Range: 0 to 800 Litres/minute  
  6. Bandwidth: 600 Hz  
  7. Precision: ≤1%  
  8. Linearity: ≤0.1% |
| vii.| Analog Inputs (user configurable voltage range): 4, or better, for Analog inputs time and also for synch pulse recording from 3rd party hardwares for time synchronization. |
| viii.| B. Analog outputs: Raw sensor Analog data outputs of O2, Co2 and Flow sensors. |
| ix. | ECG: Should include ECG sensor |
| x. | Software features:  
  7. The following parameters should be measured during metabolic exercise test with Metabolic Analysis System for all 3 phases of a metabolic test: Rest, Exercise and Recovery. All parameters including Resting Energy Expenditure should be computed |
throughout the whole test:
8. $\text{FiO}_2$, $\text{FiCO}_2$, $\text{Vt}$, $\text{FeO}_2$, $\text{FeCO}_2$, $\text{FETO}_2$, $\text{FETCO}_2$, Heart Rate, ST segment, SAP, DAP
9. The following variables should then computed:
Breathing Rate, Vebtps, VO2 (l/min), VO2/kg, Respiratory Ratio, VCO2, O2Pulse, Gross Efficiency, Half Recovery Time and HR, Metabolic Rate, METS, PETO2, PETCO2, REO2, RECO2, Ventilatory Reserve, Cardiac Reserve, DVO2/DW, Cardiac Response, TRUEO2, Vd/Vt, FVC, Caloric Equivalent, REE, Cardiac Output and Cardiac Stroke.
10. It should be possible to perform Flow Volume Curves during a test to detect hyperinflation subjects.
11. It should be possible to run Spirometry and Cardiac Stress test stand-alone, independently and together with Metabolic Exercise Test too.
12. It should be possible for results editing and data export in tabular and graphical interactive interpretation.

B. Tests should be able to be realized in Normoxy, Hypoxia or under respirator and with modification, in hypobaric chamber.

xi. Integration and Synchronization: Metabolic Analysis System should save data in ASCII Text format with external synch markers at a certain frequency at it’s Analog input, for time synchronization with third party equipments for post-processing analysis.

xii. B. Should include Cart, 2 Monitors, starting set of consumables like complete mask and a supplementary set of face piece, headgear and adapter, Protection filters, Spirometry filters, sampling line, calibration tank equipped with a double chamber pressure regulator.

2 2A MOBILE WIRELESS EEG SYSTEM WITH SALINE ELECTRODES
1. Should be a minimum 32 channel EEG system, Ultra lightweight for mobile applications.
2. Should offer Wireless transmission of data and should be capable of storing data internally on SD-Card and/or hard disk.
3. Should be offered with a saline Based sensor cap with 32 pieces of electrodes.
4. Should be expandable to 64 channels of EEG System, with 8 Auxiliary channels and 8 BIT Trigger for peripheral signal recording.
5. Should have Built-in TTL Trigger input.
6. Should be able to store data on an exchangeable SD-Card and hard disk.
7. System should be able to integrate with third party devices like research EMG devices, motion tracking etc.
8. Should be compatible with all the electrode types: passive, active, active dry and Water Based Net Cap.
9. Electrodes should be supplied with 32 pcs of high-quality Ag/AgCl sensors with a wide port to apply Gel. Caps should be offered with exchangeable sponge tips. Should include consumables to continue the recordings for 15-30 mins.
10. Each electrode should have a built-in adjustable bands to mould the cap for better comfort and fit to various head shapes.
11. Each electrode should have a port to refill saline water if any electrode becomes dry.
12. Users should be able to repair electrodes themselves at site without the need of replacing the whole caps.
13. Cap should be based on the international 10-20 positioning system.
14. Should be European CE certified.
15. Features:
   a. Sampling rate: 1000 Hz
   b. Wireless transmission range: up to 10 m indoors and up to 30 m outdoors
   c. A/D conversion: 24 bit
d. Operating range: +/- 341.6 mV
e. Resolution: Approx. 40.7 nV / bit
f. Noise: less than 2 µV pp from 0.01 Hz - 65 Hz
g. CMRR: more than 80 dB at 50/60 Hz
h. Should have Built-in 3-axis accelerometer
i. Should have Uninterrupted recording time: up to 3.5 h with internal battery (extendable via power bank)
j. Weight: less than 60 grams

16. Should be offered with Windows based Recording Software, should have wizard-based workspaces for various research requirements and protocols. Menu structure to guide the user with all crucial steps for setting up the hardware/software filter configuration, selecting the hardware filters on a channel-by-channel basis from the same manufacturer.
   a. Data Recording Software-Recording Software should be able to record and process the data acquired from electrodes and auxiliary sensors with the below features.
   b. The recording software should be from the same manufacturer as the amplifier to ensure maximum compatibility and a better sampling rate. Open source or universal processing software like Matlab or toolboxes will not be accepted.
   c. The selection of hardware filters on a channel-by-channel basis should be easy and fast. The acquired data should be displayed in multiple ways and the channel montages (original, bipolar and average) to be made switchable on the fly, to adjust the channel view to the specific experiment needs.
   d. It should be able to check the channel by channel impedance
value should be displayed with a fully selectable color coding.

e. It should be able to perform a complete evoked potential analysis in real-time directly and the segmented/averaged data should be stored together with the raw data.

f. It should be compatible to send out the incoming data to the network via the TCP/IP protocol using the Remote Data Access module for real-time data analyses.

g. Should be able to do Online Average Overlay-allows you to add a static overlay of a previously recorded average to the average view and thus compare the ongoing wave with a prototypical one.

h. Should offer the selection of Default Display Interval i.e to select the length of the time interval to be displayed by default on the computer screen.

i. Should offer to select a subset of channels during monitoring.

j. Should offer Interface to the active electrode control software, should be able to automatically save the impedance values in the header file of EEG data and should not need a separate file to save them.

k. Acquisition software should be able to transfer the data to the other Programs like MATLAB and Python, located on the local computer or on computers in the network.

l. BCI Applications Should have Provision for scripting and developing user defined analysis for BCI tools along with Data exporting.

m. The data scripting should be enabled where the user can script own code for special
purpose applications along with the export facility to load into any other analysis tools should be available.

17. Data Streaming-The system should be able to stream the online recorded data with user specified filters, and segmentation over a TCP/IP protocol to the computer network of the Lab.

18. Must quote (door delivery) price for 3 year warranty and support.

<table>
<thead>
<tr>
<th>2B</th>
<th>26 CHANNEL WIRELESS EMG SYSTEM</th>
</tr>
</thead>
</table>

1. System should be offered with 26 wireless sensors, each channel should have a Built-in IMU to upgrade our existing Noraxon EMG system. Each Sensor unit should be compatible with our existing EMG device.

2. Should be shielded lead based sensors and not just the contact points. The whole sensor has to be in touch with the muscle to be measured. Should offer no movement artefacts in the EMG data.

3. The wireless EMG sensors should be able to charge and communicate using the existing charging cradle.

4. Sensors should have shielded EMG leads.

5. Should be able to record from prosthesis by modifying the lead length without drilling holes in the prosthesis.

6. Should be able to work with extensions for the existing sensor for collecting EMG, ECG, respiration, Linear Force, Footswitch, Goniometer, Insoles, biomonitor, accelerometer etc.

7. Should be able to sync with any standard research equipment by sending TTL triggers including EEG data, and camera for tracking so that everything is recorded in Sync.
8. Electrode Impedance Test: Integrated into sensors

9. EMG Sensor Dimensions - Weight: 25 grams or less.

10. Each sensor unit should have a multi-colored LED to indicate battery or functional status and identification of the sensor unit.

11. EMG System should offer 24 bit resolution with sampling rate upto 4,000 Hz and following features:
   a. ± 24,000 µV EMG input range
   b. Input Impedance > 1,000 MOhm
   c. Resolution (5,000 To 24,000uv) :1.1uv
   d. High Pass Filters :Upto 20hz
   e. Low Pass Filters :Upto 1500hz
   f. EMG Baseline Noise: <1µv
   g. Integrated 16g accelerometer
   h. CMRR < -100dB

12. Each EMG sensor unit should have a multi-colored LED to indicate battery or functional status and identification of the sensor unit.

13. Internal Memory >8 Hours Of Data Storage.

14. System should be offered with an extension receiver unit and three charging stations, each with a capacity to hold 9 sensors of both EMG/IMU at the same time.

15. The sensors should be sweat resistant.

16. Data transmission should be wireless (from sensors to receiving unit).

17. EMG signal receiving unit range at least 30 meters.
18. On board solid state buffer memory system for lossless data recording, even when the sensor is out of range of the receiving unit.

19. Weight <20 grams including battery.

20. Should have synchronization trigger input and output in the Receiver unit.

21. Receivers should have the option to output analog data up to 32 channels.

22. Must quote (door delivery) price for 3 year warranty and support.

<table>
<thead>
<tr>
<th>3</th>
<th>OPTIONAL ITEMS</th>
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<tbody>
<tr>
<td>3A</td>
<td>myoMUSCLE Software to allow display of data from EMG and motion tracking on the same interface and can even overlay data. Software to measure and record acceleration, angular velocity, and magnetic field amplitude simultaneously with measurement sensors. Enable IMU data for individual sensors during measurement setup.</td>
</tr>
<tr>
<td>3B</td>
<td>MyoSync should be provided which will enable to send TTL triggers to sync other third party devices including EEG recording system, and motion capture system.</td>
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<td>3C</td>
<td>2 or more optical passive marker IR cameras for full body tracking of the subject, to generate full body kinematics and dynamics model in real-time in a tight feedback-control loop, as well as for post-analysis. Camera resolution: 1.3 Mega-pixel or higher.</td>
</tr>
<tr>
<td>3D</td>
<td>4 or more EMG sensors which should be shielded lead based sensors and not just the contact points. The whole sensor has to be in touch with the muscle to be measured.</td>
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</tbody>
</table>
I have also enclosed all relevant documents in support of my claims, (as above) in the following pages.

Signature of Bidder

Name: __________________________

Designation: _______________________

Organization Name: __________________________

Contact No. : ____________________________
DECLARATION SHEET

We, ________________________________ hereby certify that all the information and data furnished by our organization with regard to this tender specification are true and complete to the best of our knowledge. I have gone through the specification, conditions and stipulations in details and agree to comply with the requirements and intent of specification.

This is certified that our organization has been authorized (Copy attached) by the OEM to participate in Tender. We further certified that our organization meets all the conditions of eligibility criteria laid down in this tender document. Moreover, OEM has agreed to support on regular basis with technology / product updates and extend support for the warranty.

The prices quoted in the financial bids are subsidized due to academic discount given to IIT Delhi.

<table>
<thead>
<tr>
<th>We, further specifically certify that our organization has not been Black Listed/De Listed or put to any Holiday by any Institutional Agency/ Govt. Department/ Public Sector Undertaking in the last three years.</th>
<th>NAME &amp; ADDRESS OF THE Vendor/ Manufacturer / Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Phone</td>
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<tr>
<td>2 Fax</td>
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<tr>
<td>3 E-mail</td>
<td></td>
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<tr>
<td>4 Contact Person Name</td>
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<td>5 Mobile Number</td>
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<td>6 GST Number</td>
<td></td>
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<tr>
<td>7 PAN Number</td>
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<tr>
<td>(In case of on-line payment of Tender Fees)</td>
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<tr>
<td>8 UTR No. (For Tender Fee)</td>
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<tr>
<td>(In case of on-line payment of EMD)</td>
<td></td>
</tr>
<tr>
<td>9 UTR No. (For EMD)</td>
<td></td>
</tr>
<tr>
<td>10 Kindly provide bank details of the bidder in the following format:</td>
<td></td>
</tr>
<tr>
<td>a) Name of the Bank</td>
<td></td>
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<tr>
<td>b) Account Number</td>
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</tr>
<tr>
<td>c) Kindly attach scanned copy of one Cheque book page to enable us to return the EMD to unsuccessful bidder</td>
<td></td>
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</table>

(Signature of the Tenderer)

Name:

Seal of the Company
List of Government Organizations for whom the Bidder has undertaken such work during last three years (must be supported with work orders)

<table>
<thead>
<tr>
<th>Name of the organization</th>
<th>Name of Contact Person</th>
<th>Contact No.</th>
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</table>

Name of application specialist / Service Engineer who have the technical competency to handle and support the quoted product during the warranty period.

<table>
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<tr>
<th>Name of the organization</th>
<th>Name of Contact Person</th>
<th>Contact No.</th>
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Signature of Bidder

Name: _______________________

Designation: ___________________

Organization Name: ___________________

Contact No.: ___________________
# Previous Supply Order Details

(Annexure – IV)

Name of the Firm_____________________________________

<table>
<thead>
<tr>
<th>Order placed by (Full address of Purchaser)</th>
<th>Order No. and Date</th>
<th>Description and quantity of order equipment</th>
<th>Value of order</th>
<th>Date of Completion of delivery as per contract</th>
<th>Has the equipment been installed satisfactorily (Attach a Certificate from the Purchaser/Consignee)</th>
<th>Contact person along with Telephone No., Fax No. and email address</th>
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</table>

Signature and Seal of the Manufacturer/ Bidder

__________________________________

Place: ____________________________

Date: ____________________________
Tender No. :- ……………………………….. Date:- …………

To
The Director,
Indian Institute of Technology Delhi,
New Delhi- 110016

Dear Sir,

We manufactures of original equipment at (…………………………..address of factory…………………………..) do hereby authorize M/s (Name and address of Agent) to submit a bid, negotiate and receive the order format against your tender enquiry.

M/s. ……………………………. is authorized to bid and conclude the contract in regard to this business.

We hereby extend our full guarantee and warranty as per clause ……………………… of the terms and conditions NIQ for the goods and services offered by the above firm.

Yours Faithfully,

(Name)
(Name & Seal of Manufactures)

Note: -

1. **Items of indigenous nature or quoted in INR**, more than 1 authorized representative may participate in the same tender and submit their bids on behalf of their OEM/Principal/Manufacturer if the OEM permits more than one authorized bidder in such case as per their policy.

2. **In cases of agents quoting in offshore procurements**, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. **One manufacturer can also authorize only one agent/dealer**

3. The letter of authority should be on the letterhead of the manufacturer and should be signed by a person competent and having the power of attorney to bind the manufacturer. The same should be included by the bidder in its techno-commercial unpriced bid.
(ANNEXURE-VI)

(For Goods/ Services Contracts)

No.______________________

Dated:_______________

CERTIFICATE

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that this bidder is not from such a country.

OR (whichever is applicable)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that this bidder is from ______________(Name of Country) and has been registered with the Competent Authority. I also certify that this bidder fulfills all the requirements in this regard and is eligible to be considered.

(Copy/ evidence of valid registration by the Competent Authority is to be attached)

Signature of Bidder/ Agent

Name: __________________________

Designation: ______________________

Organization Name: __________________________

Contact No. : ____________________________
CERTIFICATE

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries and hereby certify that this bidder is not from such a country and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority.

OR (whichever is applicable)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries and hereby certify that this bidder is from __________(Name of Country) and has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I also certify that this bidder fulfills all the requirements in this regard and is eligible to be considered.

(Copy/ evidence of valid registration by the Competent Authority is to be attached)

Signature of Bidder/ Agent

Name: ___________________________
Designation: _______________________
Organization Name: ___________________
Contact No. : ____________________________
BID SECURITY UNDERTAKING
(To be issued by the bidder on company’s letterhead in lieu of EMD)

To,

The Registrar,
I.I.T. Delhi, Hauz Khas,
Delhi – 110016.

We, M/s ____________________________________________ (Name of the Firm), with ref. to Tender No. ____________ dated __________ hereby undertake that:

1. We accept all terms and conditions of the tender document.
2. We accept that, we will not modify our bid during the bid validity period and will honour the contract after the award of contract.
3. In the event of any modification to our bid by us or failure on our part to honour the contract after final award, our firm may be debarred from participation in any tender/ contract notified by IIT Delhi for a period of one year.

Yours faithfully,

(signature)
Name:
Date:
Office Seal:
## BID SUBMISSION

### Online Bid Submission:

The Online bids (complete in all respect) must be uploaded online into two Envelops as explained below:-

<table>
<thead>
<tr>
<th>Envelope – 1</th>
<th>Content</th>
<th>File Types</th>
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</thead>
<tbody>
<tr>
<td>Sl. No.</td>
<td>Document</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Compliance Sheet (Annexure - I)</td>
<td>.PDF</td>
</tr>
<tr>
<td>2.</td>
<td>Organization Declaration (Annexure - II)</td>
<td>.PDF</td>
</tr>
<tr>
<td>3.</td>
<td>List of organizations/ clients where the same products have been supplied (in last two years) along with their contact number(s). (Annexure-III)</td>
<td>.PDF</td>
</tr>
<tr>
<td>4.</td>
<td>Technical supporting documents in support of all claims made at Annexure-I</td>
<td>.PDF</td>
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<tr>
<td>5.</td>
<td>Previous Supply Order (Annexure - IV)</td>
<td>.PDF</td>
</tr>
<tr>
<td>6.</td>
<td>Original Equipment Manufacturing Authorization Form (MAF) (Annexure - V)</td>
<td>.PDF</td>
</tr>
<tr>
<td>7.</td>
<td>Certificate - Bidder Not from/ from Country sharing Land border with India &amp; Registration of Bidder with Competent Authority (Annexure-VI)</td>
<td>.PDF</td>
</tr>
<tr>
<td>8.</td>
<td>Certificate – Bidder Not from/ from Country sharing Land border with India, Registration of Bidder with Competent Authority &amp; not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority (Annexure-VII)</td>
<td>.PDF</td>
</tr>
<tr>
<td>9.</td>
<td>Bid Security Undertaking in lieu of EMD (Annexure-VIII)</td>
<td>.PDF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Envelope – 2</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sl. No.</td>
<td>Document</td>
</tr>
<tr>
<td>1.</td>
<td>Price bid should be submitted in given BOQ_XXXX.xls format. (Note: -Comparison of prices will be done ONLY on the bids submitted for the Main Equipment and anything asked as ‘Optional’ in the specs is not to be included for overall comparison.) Bids for optional items are to be submitted in ‘sheet2_Quote for optional items’</td>
</tr>
</tbody>
</table>