

Annexure- A

No.94/Phy/RIMS/E-C-15

Imphal 19th Dec 2015

(all the equipment should be US FDA approved/CE Certified)

Item no.1:- Computerized Exercise Physiology System

- i. The system should be able to record & measure VO₂ oxygen consumption, VCO₂ carbon dioxide production, VE expired minute volume, RER respiratory exchange ratio, ECG, HRV, Body Temperature and Pressure Saturate BTPS, Standard Temperature and Pressure Dry STPD, (VE/VO₂), (VE/VCO₂) etc. and should generates a number of graphs like Metabolic Log Window, VE (BTPS) vs VO₂, VE (BTPS) vs VCO₂, VCO₂ vs VO₂, RER vs Time, VO₂ vs Time, VE (BTPS) vs Time.
- ii. Should be supplied with multichannel recording unit with a range of + 2 mV to + 10 V sampling rate of 400 KHZ (aggregate speed).
- iii. ADC resolution of 16 bits on all gain ranges and variable sampling speed on each channel with continuously record and display up to 32 channels of data.
- iv. The system should provide wireless monitoring of Posturography, 4 channel force sensor balance board should communicate with the Software via inbuilt blue tooth.
- v. To plot real time flow & volume loops. ECG switch box (lead I, II, III, aVL, aVF, aVR and V1 to V6) for real time cardiac axis and vector analysis.
- vi. The software should have step by step by step instructions, protocol and experimental design for performing various experiments in physiology teaching applications. Also should have sample data for animal experiments for demonstrating to the students.
- vii. Facility to perform complete heart rate variability analysis (Time & Frequency domains) during exercise.
- viii. Have oxygen sensor with minimum range of 5-100% oxygen and resolution of at least 0.02% and the carbon dioxide sensor with minimum range 0-8% of carbon dioxide and resolution of at least 0.1% and variable flow range of 0-185 ml/min for best performance and results.
- ix. Supplied with breathing accessories and Douglas bags.
- x. Must have a facility for interfacing finger arterial based noni invasive Beat to Beat continuous blood pressure monitoring with Systolic, Diastolic, CO, BRS etc.
- xi. The software should provide an easy file sharing option to a distant user with-out involving any cost with a 5 year of free updates and upgrade.
- xii. IEC 60601-1 & ISO 9001:2008 certification for safety and quality standards.
- xiii. An obligatory demonstration of the equipment and necessary training to be provided by the experts.
- xiv. To be supplied with compatible bicycle ergometer, branded computer & UPS.



Item no.2:- Continuous Beat to Beat Human NIBP System

- i. Should be able to record continuous beat-to-beat blood pressure non-invasively from the human subject for long term recording.
- ii. Should have facility for Height Correction Unit.
- iii. Should have facility for online and offline recording & Analysis.
- iv. Accuracy 1% for Cuff Pressure (within 3 mmHg) and Heart Rate Accuracy [HR (bpm)/60] %
- v. One pairs of each of finger cuffs of small, medium and large sizes.
- vi. Should have Volume Clamp Technology that providing accurate finger pressure measurement.
- vii. Must have brachial arterial reconstruction technology that translates the finger pressure into the commonly used brachial arterial blood pressure.
- viii. The analysed data should be exported to text, excel and other file formats.
- ix. The Blood pressure data should be integrated & analysed with HRV data.
- x. Necessary software for recording and analysis of blood pressure signal. The software should provide hemodynamic parameters from pressure data, wave forms etc.
- xi. The operating temperature must be within 10 - 40°C (50-104°F).
- xii. The operating humidity (non-condensing) should be within 5 - 90%.
- xiii. Software update and upgrades should be provided for at least next 5 years.
- xiv. Must have necessary certification like ISO, IEC and FDA etc.
- xv. Onsite training from the company experts should be provided.
- xvi. Should be compatible and seamlessly interface to Labchart Software for recording and analysis without any additional hardware.
- xvii. Electronic Tilt Table (0 - 90 degree) to be quoted separately.



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