

**Department of Mechanical Engineering
Indian Institute of Technology Delhi**

25 March 2013

SUBJECT: N.I.Q. for the purchase of a U universal Vibration Machine

Quotations are invited for the purchase of a modular Universal Vibration test setup that should be able to perform the following experiments in the same set up:

- Simple pendulum
- Compound pendulum
- Centre of percussion
- Determination of the acceleration due to gravity by means of a reversible pendulum
- Bifilar suspension
- Mass-spring systems
- Torsional oscillations of a single rotor
- Torsional oscillations of a single rotor with viscous damping
- Torsional oscillations of a two rotor system
- Transverse vibration of a beam with one or more bodies attached
- Undamped vibration absorber
- Forced vibration of a rigid body-spring system with negligible damping
- Free damped vibrations of a rigid body-spring system
- Forced damped vibration of a rigid body-spring system

Specification of the experiments / setup should cover the following:

- a. The test setup should be having the heavy and sturdy steel frame and storage area for storing accessories. The frame with small wheels and cupboard should be mobile so that it can be moved around easily. The frame should be adjustable to enable levelling.

- b. Studies on different pendulums, their characteristics and behavior should be possible with simple wooden and steel Bob and Kater pendulums, a wooden compound pendulum and a bifilar suspension bar.
- c. Mass-Spring System should include different masses and springs of different rate to enable estimation of time period and frequency of natural mode; should enable experiments on Free and Forced Vibrations in a beam and spring system. It should include a long steel beam and supports, a damping dashpot and a drum recorder (with power) or better alternative to record vibration of system.
- d. Motor and Speed Control: The motor with speed control should be of best quality to give controlled, forced vibrations at a known frequency. The system should also be able to help trigger the optional stroboscope.
- e. Vibration Absorber should be able to study how to 'tune' two bodies to absorb vibrations. In the form of two masses fitted at equal distances on a leaf spring assembly. The system should also allow one to study SHM Torsional Oscillations in a twisting shaft. The setup should include at least three different shafts and two different flywheels and inertia weights, shaft clamps.
- f. The test setup should allow study on damped Torsional Oscillations and study influence of damping due to oil on torsional oscillations of shaft. This should include a pen recorder and dashpot; at least three different shafts, an oil reservoir assembly and oil clamps to hold the parts.
- g. The total sound level of the system while standing at 1feet from the setup should be less than 72dBA.
- h. The entire system should operate with 50Hz 230V electrical supply.
- i. Tools included in the setup: Metric allen keys (hexagon tools) Metric spanners, A stopwatch and a rule.
- j. Nett dimensions and weight: less than $3m^3$ and less than 450 kg
- k. The entire system should be comply with latest European Electromagnetic and Mechanical CE marking directives (Directive 2004/108/EC). The system should comply with the Directive 2006/42/EC for the machinery.
- l. The system should accompany a comprehensive user guide.
- m. The quote should enlist additional accessories, if any, as options priced separately.

Please note:

1. Separate sealed technical and financial bids should be put inside a sealed envelop and submitted.
2. The Quotation received after due date will not be considered.
3. The Institute reserves the right to reject any quotation without assigning any reasons.
4. Validity of the quote should be atleast 90 days.
5. The Payment terms should be specified in the quotation, advance payment & payment against delivery are not acceptable.
6. Payment will be made through wire transfer after successful installation.
7. A warranty of atleast 2 years from date of installation should be given. Rates for an extended warranty / AMC beyond the initial warranty period should also be given.
8. A company profile along with a client list and copies of POs of past clients should be included in the technical bid.
9. The technical bid should include a compliance sheet clearly specifying compliance or otherwise on all the aspects mentioned in this NIQ.
10. In case the bid is a given through an agent, a valid agentship certificate should be attached.
11. If the item is a proprietary item, a proprietorship certificate form the principle manufacturer should be included.
12. Accessories needed for functioning of the equipment should be included in the quote and clearly specified. Additional accessories available may also be quoted separately as optionals.
13. If the item is to be imported, delivery should be made on FOB basis only, and prices quoted should include all taxes at source.
14. For items quoted in Indian Rupees, all applicable taxes should be clearly indicated.

Sealed bids as above should be submitted on or before 11AM on 12th April, 2013 to the following address:

Dr A K Darpe

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