



भारतीय प्रौद्योगिकी संस्थान  
INDIAN INSTITUTE OF TECHNOLOGY  
(काशी हिन्दू विश्वविद्यालय)  
(BANARAS HINDU UNIVERSITY)

रासायनिक अभियांत्रिकी एवं प्रौद्योगिकी विभाग  
DEPARTMENT OF CHEMICAL ENGINEERING & TECHNOLOGY  
(उच्चानुशीलन केन्द्र एवं डी एस टी प्रायोजित 'फिस्ट' विभाग)  
(CENTRE OF ADVANCED STUDY & DST DEPARTMENT UNDER FIST)  
(वाराणसी - 221004) Varanasi - 221005

QUOTATION ENQUIRY

Ref: ChE/2019-20/QTN/ 77  
Posting Date: 20.08.2019

Tender Closing Date: 03.09.2019

Date 20.08.2019  
Tender Opening Date: 04.09.2019

Dear Sir,

Please submit your lowest rate for supplying the under mentioned items. Quotations in duplicate reach us before the date marked above and should contain the following information:

1. Full specification and make of the item offered and its rate F.O.R. Varanasi/CIF New Delhi.
2. Sales Tax/GST at concessional rate as applicable to educational institution.
3. Your VAT/GST registration number, PAN&TAN numbers.
4. Conditions of supply and terms of payment.

If you are a manufacture of the item or if you have proprietary right over it, please mention it in the quotation and provide a certificate.

5. Please mention your agency commission in Indian Rs., if applicable (in case of imported items).
6. Please give undertaking as per annexure-I-B

Quotation must be sent in a **Sealed Envelope** with word "QUOTATION", our reference number, and due date as given above, clearly marked over it.

List of Equipments with specifications enclosed.

N.B: Other terms & conditions pertaining to item mentioned above, shall be mentioned below:

The sealed quotations will be opened on 04.09.2019 at 03.00 PM in the office of the Head, Department of Chemical Engineering & Technology, IIT(BHU) (This is mandatory in case of e-publishing)

Head of the Department

विभागाध्यक्ष, Head  
रासायनिक अभियांत्रिकी प्रौद्योगिकी विभाग  
Department of Chemical Engg. & Tech.  
भारतीय प्रौद्योगिकी संस्थान, Indian Institute of Technology  
काशी हिन्दू विश्वविद्यालय / Banaras Hindu University  
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## Specification of Experimental Setups for Process Dynamics and Control Laboratory

S.No.	Name of the Experimental Setup	No of units required	Specifications
1	Two Tank Interacting and Non Interacting System	02	There should be provision to conduct experiments to evaluate the Dynamic Characteristics of the Two Tank System connected in Interacting and Non-Interacting Manner. The setup include stainless steel water tank along with circulating pump. Other details are as follows Tank Volume:20 Litres or more Tank Material: SS/Standard Valve: Swagelok / Standard Connecting Pipe Diameter: ½ inch or more
2	Control Valve Characteristics	02	The setup should contain minimum three pneumatic valves. The valves should be mounted on SS frame. All valves should be connected with standard needle valve to control the inlet flow rate and rotameter to measure the flow rate. All items used in the setup should be from standard make. Connecting Pipe Diameter in the setup should be ½ inch or more. The setup include ss water tank along with circulating pump.
3	Dynamics of U Tube Manometer	02	The setup should consist of 2 U Tube manometers containing mercury and water. There should be provision to introduce step input and record (take readings) of I <sup>st</sup> and II <sup>nd</sup> peak as well as time.
4	To Study the Static and Dynamic Characteristics of Temperature Measuring Devices	02	The setup should be consisted of Temperature Measuring Devices such as Thermocouple, Thermometers and Resistance Temperature Detectors (RTD) etc. along with provision to disturbances and record the variation in reading with time. Provision for experiments on signal conditioning should also be included in the setup.
5	Dynamic Response of Pressure Tank	02	The setup should be consisted of a cylindrical pressure tank (Minimum 30 Litres) with supply of air through a pressure regulator, a valve (needle valve) and a well calibrated rotameter. The outlet of the tank should be connected with well calibrated precise valve. To measure the pressure in the tank, a well calibrated large dial pressure gauge and a U-Tube manometer should be connected with the setup. The disturbance in the setup may be introduced by changing the flow of air which can be measured by rotameter. Connecting Pipe Diameter in the setup should be ½ inch or more.
06	Dynamic Response of Liquid Level in Single Tank System	02	The setup should be consisted of a SS tank/Glass column (Minimum 20 Litres) with inflow through a rotameter and outflow through a well calibrated needle valve. Connecting Pipe Diameter in the setup should be ½ inch or more. The setup include ss water tank along with circulating pump.



07	Temperature Control Trainer	01	The setup should have provision to study the close loop response of a Temperature Control Process.
08	Level Control Trainer	01	The setup should have provision to study the close loop response of a Level Control Process.
09	Pressure Control Trainer	01	The setup should have provision to study the close loop response of a Pressure Control Process.
10	Flow Control Trainer	01	The setup should have provision to study the close loop response of a Flow Control Process.
11	Humidity Measurement Trainer	01	The setup should be consisted of different techniques used for Humidity measurement
12	Flow Measurement Trainer	01	The setup should be consisted of different techniques used for Flow measurement
13	Pressure Measurement Trainer	01	The setup should be consisted of different techniques used for Pressure measurement
14	A/D and D/A Converters	01	The setup should demonstrate A/D and D/A conversion
15	PID Control Trainer	01	The setup should demonstrate P, PI, PD and PID control actions.
16	Peristaltic Pumps	03	Range: 0 – 100 mL/h

Remarks:

1. Miniature type setups only for demo purpose are not required. The setup should be fully functional with good reproducibility of results.
2. Only standard make components should be used in the setup.
3. The Trainers should be available with open code software.
4. The PC/Laptop of minimum required configuration should be quoted with trainers and other setups (if required).
5. For any clarification regarding specifications, please contact Prof. R.S. Singh (09450119379),  
[Email-rssingh.che@iitbhu.ac.in](mailto:Email-rssingh.che@iitbhu.ac.in).

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