

Department of Physics
Chaudhary Ranbir Singh University, Jind
(Established by the State Legislature Act 28 of 2014)
Recognized by UGC 1956 u/s 12-B & 2 (f)

No.CRSU/PHY/2018/01

Date: 17.12.2018

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Subject: Request to participate in limited quotation by providing estimate/ quotation for Lab. Equipments/ Tools for Sply, Installation, Testing & Commissioning of Instruments for setting up a Physics Laboratory at CRSU, Jind.


Dear Sir/Madam,

Chaudhary Ranbir Singh University, Jind has been established by Govt. of Haryana in the year of 2014. The University is in the process to setting up of Physics Laboratory for its M.Sc. Physics programme and requests to provide the estimate/rates/quotation of items listed in Table-1 in sealed cover, on or before 02.01.2019 by 05:00 P.M. in the enclosed pro-forma. No quotation will be entertained after the last date. The quotation received with cutting/ overwriting will not be entertained.

Terms and conditions:

1. Vender must be one of the reputed manufactures/dealers. The vendor has to enclose certificate with quotation that firm is having authentic and valid GST registration number.
2. It is mandatory for successful vendor to provide Lab. Manual along with the supplied instruments.
3. The successful vendor will be responsible to provide 05 years onsite warranty on the supplied instruments.
4. Besides the demonstration of the instruments, it will be a sole responsibility of the successful vendor to provide at least three days training to the faculty and other staff at CRSU campus without any extra cost. The date and time will be decided for training in mutual conversation.
5. The successful vendor will be required to visit at least once in a semester time to the laboratory on the date and time given by Chairperson, Department of Physics, CRSU, Jind.
6. In addition to the lab instruments, successful vendor will also provide 15 sets of scientist's portraits, PVC and raxine laboratory charts.

7. The agency shall provide a phone number of atleast one authorized representative/supervisor for the services/ for dealings.
8. The successful vendor shall be responsible to provide immediate standby (if situation arises) of any instrument provided by him, if demanded.
9. The successful vendor shall be required to furnish a Performance Security equivalent to 10% of the total amount in the form of Demand Draft or in the form of Bank Guarantee in favor of the Registrar, CRSU, Jind, payable at Jind within 15 days of receipt of "Work Order". The Performance Security shall remain valid for a period of 12 months after successful completion of the warranty period. The Performance security will be forfeited in the event of violation of any of the terms & conditions of the agreement/policy for deployment of services.
10. Any disputes arising out and in relation to this agreement shall be referred to arbitration by sole arbitrator, to be appointed by the Vice-Chancellor of the University. The arbitration would be conducted and governed by and under the provisions of Arbitration and Conciliation Act 1996. The language of Arbitration shall be English and the seat of Arbitration shall be at CRSU, Jind Campus. Any legal dispute will be subject to jurisdiction of Jind Courts and no other Court shall have the jurisdiction.
11. All liabilities arising out of accident or mis-happening while on supply, installation, testing and commissioning of instruments for setting up a physics laboratory at CRSU, Jind shall be borne by the vendor. The vendor shall be responsible for any injury or accident to his staff during visit or commencing the project and no claim shall be given by the University.


Chairman (DAA)
Special Committee
Physics Department
C.R.S. University, Jind (HR)

Enclosure: Performa to Quote the Estimate

Table - 1

Sr. No	Name of Instruments	Detailed Specifications.	Quantity	Rates (In Rs.)
	For M.S.C Physics Sem-II General Physics			
1	To measure the resistivity of a Ge crystal using four probe method at different temperatures and find its energy band gap.	Resistivity of Semiconductors by Four Probe Method at Different Temperatures and Determination of Band-Gap The experiment consists of the following : (i) Four Probe Arrangement (ii) Oven (upto 200°C) (iii) Sample : Ge Crystal mounted (iv) Thermometer (0-200°C) (v) Four Probe Setup (a) Constant Current power supply digital Accuracy : +0.25% of the reading +1 digit Load Regulation : 0.03% for no load to full load (b) Electronic Milli voltmeter 200 mV Accuracy : + 0.1% of reading = 1 digit Impedance : 1 M ohm Display : 3½ digit, 7 segment LED (12.5mm) height with auto polarity and decimal indication.	1	
2	Lattice dynamic kit: (i) To study the dispersion relation of monoatomic lattice and to find the cut off frequency. (ii) To study the dispersion relation of diatomic lattice: acoustical, optical branches, Energy gap and comparison of experimental and theoretical values.	It consists of an Audio oscillator with amplitude control and facility to vary the frequency from 0.9 KHz to 90 KHz. It has built in powersupply and output stage to match the impedance of simulated lattice. Another part of Lattice Dynamic Kit consists of transmission line, which simulates one- dimensional mono-atomic and di-atomic lattices. The only additional equipment needed is a General purpose C.R.O	1	
3	Determination of Lande g-factor of DPPH using ESR spectrometer.	Specifications:- An Electronics unit with in built following feature are. FET based marginal R.F. Oscillator upto 20 MHz Digital display of frequency upto 20 MHz. Excellent peaks display using DPPH Coils Digital display of Helmholtz Coil Current upto 250 mA. Sensitivity Control and phase control. Optional Accessories:- CRO Dual Channel.	1	
4	To study the band gap of a semiconductor material using p-n junction diode and find the diffusion potential of the diode.	Specifications:- An Electronics unit with in built following features are.. Fixed Stepply DC Regulated Supply 2, 4 & 6 Volt, Digital Microammeter upto 99.99 uA, Sample Diodes as Silicon and Ge Material, Copper Calorimeter with heating arrangement, Thermometer upto 200°C, Sample Oil, Connecting Leads.	1	

5	To study B-H curve of a given sample and find the energy loss in ferromagnetic material.	Specifications:- An Electronics unit with in built following feature are.. Stepply Variable AC Voltage, mounted soleniod with perimary and secondary coils, also supporting R & C through this coil, Two variable control for phase and sensitivity , Output terminals with X and Y Plate w.r.t to Ground, Sample Soft Iron Sticks. Optional Accessories:- CRO Dual Channel.	1	
6	To determine the dielectric constant of polar and non-polar liquids.	Main Unit has two terminals to which the di-electric cell has to be connected . (First is an electronics unit with contains following features are:- In built Frequency Counter 4 Digits, In built oscillator 500 KHz , based on calibrated electronics circut and in second part we provide Di-electric cell with special SS grade material , liquid glass container, connecting BNC to BNC Cable. Two Different type of liquids for polar and Non polar test.	1	
7	Determination of ionization potential of mercury.	Specifications :- An Electronics unit with in built which comprises of DC Regulated Power Supply 0- 15VDC/150mA & AC Power Supply 6.3 VAC/1Amp, two round meters for voltage & current measurement, valve diagram is Printed on Front panel, connections of supplies & valve brought out at 4 mm Sockets. Valve Used:-Thyratron valve 2D21/2051	1	
8	To determine Stefan's constant using black body radiations from copper plates (Electrical Method).	The KIT contains two black copper radiation plates with heater element in between, three thermometers Mercury Filled, built in AC Variable power Supply, ac. voltmeter, ac. Ammeter and their controls.	1	
9	To study the characteristics (illumination, I-V, Power-load, Areal and Spectral characteristics) of a Solar cell.	Specifications:- An Electronics unit with in built mounted MO-65 analog voltmeter and ammeter with range (0-3) V and (0-5) mA ,Mounted Decade Dials for Resistances with dial 100 Ohm & 1 Kilo Ohm, Solar Cell mounted on metallic stand and frame, A Lamp House with stand, Wooden Plank 50 cm., Electronics patch cords	1	

10	To study the energy levels of Ar using Frank-Hertz experiment.	<p>Argon filled tetrode Filament Power Supply : 2.6-3.4V continuously variable Power Supply for VG1K : 1.3-5V continuously variable Power Supply for VG2A : 1.3 - 12V continuously variable Power Supply for VG2K : 0 - 95V continuously variable All the power supplies are highly stabilised and output voltages can be read on 3 1/2 digit, 7 segment LED DPM with autopolarity and decimal indication through a selector switch.</p> <p>Saw tooth waveform for CRO display Scanning Voltage : 0-80V Scanning Frequency : 115±20Hz Multirange Analogue Voltmeter Range : 0-5V, 0-15V & 0-100V Multirange Digital Ammeter Display : 3 1/2 digit 7 segment LED Range Multiplier : 10-7, 10-8, 10-9 Power : 220V±10% mains, 50Hz. Accessories:- CRO Dual Channel.</p> <p style="text-align: right;">Optional</p>	1		
For M.S.C Physics Sem-II Electronics					
1	To study the frequency response of a single stage negative feedback amplifier for voltage series and shunt feedback.	<p>Specifications:- An Electronics unit with in built fixed (± 12 VDC), Bread Board, 2 mm ouptut banana sockets, switch for feedback function, Loose Spare components for circuit single stage amplifier using transistor CL-100 S, Single Stand Wire for connections. Optional Accessories:- CRO & Function Generator.</p>	1		
2	To study the frequency variation in RC phase shift, Colpitt and Hartley Oscillators.	<p>Specifications:- An Electronics unit with in built fixed (± 12 & ± 9 VDC), Bread Board, 2 mm ouptut banana sockets, Loose Spare components for circuit For RC Phase Shift, Colpitt & Hartley Oscillator using transistor , capacitor, inductance & others, Single Stand Wire for connections. Optional Accessories:- CRO.</p>	1		
3	To study the applications of operational amplifier as summer, astable multivibrator, Schmitt trigger, integrator and differentiator	<p>Specifications:- An Electronics unit with in built fixed (± 15 VDC), Variable DC Regulated Power Supply (0-5)V-02 Nos, IC-741, Supporting Resistance, Capacitors, Diodes, & Others, Bread board, bakelite housing, top bakelite, 2 mm ouptut banana sockets, single stand wire. Optional Accessories:- CRO, Function Generator & Digital Multimeter.</p>	1		
4	To study the frequency/amplitude modulation and demodulation.	<p>Specifications:- An Electronics unit with in built fixed DC Power supply, in built Sine wave signal with variable amplitude with 1 KHz, 2 KHz frequency as AF Signal, Carrier Frequency with higher frequency range upto 455 KHz, IC Based and supporting R & C for modulations, & de modulations with supporting diodes and others. Two kit provide for AM & FM Electronics kit. Optional Accessories:- CRO Dual Channel.</p>	1		

5	To study the analog to digital conversion and digital to analog conversion circuits.	Specifications:- An Electronics unit with in built fixed (± 15 VDC), Variable DC Regulated Power Supply (0-10)V, IC-741, Supporting Resistance & LED, Toggle Switch For (0 & 1) -04 Nos, Bread board, bakelite housing, top bakelite, 2 mm ouptut banana sockets, single stand wire. Optional Accessories:- Digital Multimeter.	1	
6	To study analog comparator circuit.	Specifications:- An Electronics unit with in built fixed (± 15 VDC), IC-741, Loose Components provide as supporting two zener diode, resistance, variable resistance pot, Bread board, bakelite housing, top bakelite, 2 mm ouptut banana sockets, single stand wire. Optional Accessories:- Digital Multimeter.	1	
7	To study the binary module-6 and 8 decade decoder and shift register.	Two Different electronics kit provide for 4 Bit Shift Register and Decade Decoder.with following specifications..... Shift Register:- DC Regulated Power Supply 5VDC/150mA, 4 SPDT switches provided for selecting logic 1 & logic 0, 1Hz mono-shot clock pulse, four output indicators, Circuit diagram for IC 7495 printed and two switches for serial input & Mode control. Decoder:-DC regulated power supply 5VDC/150mA, 4 SPDT switches provided for selecting logic 1 & logic 0, 1HZ monoshot clock pulse, 4 output indicators, circuit diagram for IC 7490, IC7447 & 7-segment display printed & connections for various inputs & outputs brought out at the sockets on the front panel.	1	
8	To study the BCD to seven segment display.	Specifications:- An Electronics unit with in built following features are:- DC regulated power supply 5VDC/150mA, 4 SPDT switches provided for selecting logic 1 & logic 0, 1HZ monoshot clock pulse, 4 output indicators, circuit diagram for IC 7490, IC7447 & 7-segment display printed & connections for various inputs & outputs brought out at the sockets on the front panel.	1	
9	To study the I-V characteristics of uni-junction transistor and its application as saw tooth wave generator.	Specifications:- An Electronics unit with in built variable DC Power Supply (0-20) & (0-50) V, Fixed 9 VDC, mounted bread board, Loose Components of Fixed and variable limiting resistance with supporting Sample UJT 2N2646 , Capacitors, Housing Plastic, Top Bakelite Sheet with fitted 4 mm banana sockets, Connecting Leads. Optional Accessories:- CRO-01 Nos & Digital Multimeter -03 Nos.	1	
10	To study the I-V characteristics of silicon-controlled rectifier and its applications.	An Electronics Unit with in built contains following features are. :- two DC Regulated Power Supplies 0-30VDC/150mA & 0-1VDC/150mA, three round meters for voltage & current measurement, SCR 2P4M mounted behind the panel, connections of Supplies, Meters & SCR brought out at 4mm Sockets.	1	
	Others			

1	Digital Multimeters	Display: 3 ½ digit display with 1999 counts Over Range Indication: "1" Operating Temperature & Humidity: 0°C to 40°C < 75% RH Storage Temperature & Humidity: -10°C to 50°C < 75% RH Polarity Indication: Displayed For Negative Polarity Data hold Function Back Light Low Battery Indication Power supply: 9 Volt battery Unit Size : 138 X 69 X 31 mm Display Size: 20×45mm Weight : Approx.170g.(Including Batteries) Accessories: Instruction Manual, 1 Set test leads & 1pc 9Volt battery.	10	
2	Analog Function Generator 100 KHz.	Specification:- An Electronic Device which is very useful & versatile laboratory instrument & it provides three basic waveform-sine, square & triangular.. Frequency Range:- 1 Hz to 100 KHz. Input Voltage:- 220V, 50 Hz. Output Voltage:- 0-15/20V Peak to Peak Cont. Variable. Output Impedence:- 50 Ohm Housed Cabinet:- Metallic/Bakelite...	2	
3	CRO 30 MHz Dual Channel	Highest Sensitivity up to 1mV/div (After Expand) Full band Trig Auto Sweep Circuit Flex Trig mode (Select either CH1 or CH2 Signal / External Signal) Alt-Trig View 2 in relative Signal Ext Trig Input Power Supply : AC 200 ±10%V Specification Bandwidth AC 10Hz ~ 30MHz (-3dB) DC ~ 30MHz (-3dB) Y Deflection 5mV / div ~ 20V / div Rise Time <18ns, Mag x 5 Accuracy : <5% Max Input 400V(DC+ACp-p) Sweep Mode Auto, Trig, Lock, Single Sweep Rate 0.1µs/div ~ 0.2s/div 1-2-5 20 steps, error ±5% Trig Source Y1, Y2, ALT, Line, Ext, TV-H, TV-V Min Sync. Level Trig DC ~ 30MHz, Int. 1 div, Ext. 0.2Vp-p, TV Int. 2div, Ext. 0.3Vp-p Trig Lock (50Hz ~ 10MHz) Internal 2div Freq. Response AC : 10Hz ~ 1MHz -3dB DC : 0 ~ 1MHz -3dB Z Max. Input 400V (DC+ACp-p) Min Input Level TTL Level WaveForm Square wave Amplitude 1KHz ±2% Frequency 0.5Vp-p ±2% Standard Accessories Power Chord, Two 30MHz Oscilloscope Probes, Manual	5	
4	Tool Kit	Wire Cutter , Soldering Iron with paste and wire	3	
TOTAL AMOUNT				
GRAND TOTAL				