

Department of Physics

University of Rajasthan, Jaipur

No *P.H.Y./2020/620*

Date: *29/01/2020*

TENDER NOTICE

Sealed quotations with terms and conditions*are invited for the purchase of different items mentioned below in the Department of Physics, University of Rajasthan, JAIPUR-302004. Interested Firms (suppliers / make) are requested to give in additional full detail of the specifications, delivery and availability of the quoted on the forwarding basis etc.

1. **Four Probe Set-up for measuring the resistivity of very low to high resistive sample at different temperature**

(i) **Probe arrangements:** Four collinear and equally spaced spring loaded probes with good electrical insulation between the probes, probe arrangement should be mounted on a suitable stand with removable sample plate and RTD sensor, proper lead connections should be provided for the current-voltage measurements.

(ii) **PID Control Oven:** the P,I,D parameters should be set for immediate use and adjustable for specific applications as well as auto-tuned the oven whenever required:

Specifications of the oven controller: Temp. range (ambient to 200 °C, and extended up to 600 °C), display accuracy - ± 0.3 °C, Setting type - Front push buttons, Control Method - PID, PIDF, PIDS; Measurement accuracy - ± 0.5 °C; Oven designed for four probe set-up, Sensor (Chromel-Alumel thermocouple); 7 segment LED two rows display; Power ~ 150 Watt; Process value, PV and Set value, SV.

(iii) **Constant Current Sources:** It can be used for (a) low to medium resistivity and (b) high resistivity measurements of the samples.

(a) **Specifications of the Constant Current source:** IC regulated current generator and ripple free d.c. source. This constant current source is suitable for the resistivity measurements of thin films of metals/alloys and semiconductors (like Ge, Si etc.)

<i>Open Circuit Voltage</i>	: 10 V
<i>Current Range</i>	: 0-20mA, 0-200mA
<i>Resolution</i>	: 10 μ A
<i>Accuracy</i>	: $\pm 0.25\%$ of the reading ± 1 digit
<i>Display</i>	: 3 $\frac{1}{2}$ digit, 7 segment LED with autopolarity and decimal indication
<i>Load Regulation</i>	: 0.03% for 0 to full load
<i>Line Regulation</i>	: 0.05% for 10% changes

(b) **Specifications of the Low current source:** These sources are needed, when the sample resistance is large. As in the case of silicon wafers or high resistive deposited thin films.

Open Circuit Voltage	: 15V
Current Range	: 0-2 μ A, 0-20 μ A, 0-200 μ A & 0-2mA
Minimum	: 1nA at 0-2 μ A range
Accuracy	: \pm 0.25% of the reading \pm 1 digit
Display	: 3½ digit, 7 segment LCD with autopolarity and decimal indication
Load Regulation	: 0.05% for 0 to full load
Power	: 2 x 9V batteries

(iv) **Microvoltmeter:** Digital D.C. Microvoltmeter

Estimated cost of the above four probe set-up inclusive all items (i-iv): ~ 60,000/-

2. DSO (Digital Storage Oscilloscope):

Specifications:

- ✓ Dual analog channels with range 1mV/div~20V/div
- ✓ 7 inches widescreen LCD displays
- ✓ Special Print Screen Feature
- ✓ Supports plug-and-play USB storage device. Communication with and remote control of computer through the USB device;
- ✓ USB drive system software upgrade
- ✓ Storage of waveforms setups and interfaces waveforms and setups reproduction
- ✓ Automatic measurement of 28 waveform parameters
- ✓ Unique waveform recording and replay function
- ✓ Multilingual menu displays

Estimated cost ~ Rs. 20,000/-

Last date & Time of Quotations submission ...^{10th} February 2020 up to^{2:00} PM

Date and Time of opening the quotations ...^{10th} February 2020 at^{3:00} PM

Terms and conditions

1. Quotation should be on the name of the **Head, Department of Physics, University of Rajasthan Jaipur - 302004** and reach this office on time.
2. Quotation received after due date will not be considered in any case.
3. The rate should be C.I.F./F.O.R. Jaipur inclusive of all charges and taxes etc.



HEAD OF DEPARTMENT
Department Of Physics
Head of the Dept. of Physics
University of Rajasthan, JAIPUR

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