



**Department of Applied Optics and Photonics
University of Calcutta**

Tender document No. AOP/LAB/22-23/01

Tenders are invited for the supply of the following items. All training kits should contain complete instruction manuals and should have a one-year warranty.
Tenders in sealed envelopes should reach the following address with 7 days from publication of this tender document on the University's website.

Head of the Department
Department of Applied Optics and Photonics
University of Calcutta Technology Campus
JD-2, Sector III, Bidhannagar, Kolkata 700106

Sl.No	Item / description	Specifications
1.	PWM & PPM-Modulation & Demodulation Trainer Kit: The single board trainer for the study of Pulse Width Modulation and Pulse Position Modulation & Demodulation technique.	<ol style="list-style-type: none">1. I.C. Regulated Power Supply.2. PWM & PPM Modulator.3. Demodulator.4. Sine Wave Signal Generator : Variable Frequency range ≤ 100 Hz to ≥ 1 KHz & Variable Amplitude [8V to 10V Max].5. Carrier Wave Generator : Frequency 11 KHz [fixed]
2.	ASK Modulation & Demodulation Trainer Kit: The single board trainer to facilitate studies in ASK Modulation & Demodulation technique.	<ol style="list-style-type: none">1. Square Wave Signal Source : Variable Frequency range ≤ 100 Hz to ≥ 700 Hz2. Sine Wave Carrier Generator : Variable Frequency range ≤ 12 KHz to ≥ 100 KHz3. Modulator using Transistor.4. Demodulator.
3.	Pulse Amplitude Modulation & Demodulation Trainer Kit: The single board trainer to facilitate studies in PAM Modulation & Demodulation technique.	<ol style="list-style-type: none">1. I.C. Regulated Power Supply.2. PAM Modulator.3. PAM Demodulator.4. Sine Wave Signal Generator : Variable Frequency range ≤ 300 Hz to ≥ 3 KHz & Variable Amplitude [6V to 8V max].5. Square Wave Carrier Generator : Frequency 11KHz [fixed].
4.	Phase Shift Keying Modulation & Demodulation Trainer Kit: The single board trainer to facilitate studies in PSK Modulation & Demodulation technique.	<ol style="list-style-type: none">1. Sine Wave Carrier Generator : Frequency ≥ 30 KHz.2. Square Wave Signal Source : Variable Frequency 16 to 20 KHz [Max] and Amplitude [5V to 8V Max]3. PSK Modulator.4. PSK Demodulator.

Sl.No	Item / item description	Specifications
5.	Pulse Code Modulation & Demodulation Trainer Kit: The single board trainer to facilitate studies in PCM & Demodulation technique.	1. IC Regulated Power Supply : +5 V @500 mA. 2. IC Regulated Power Supply : +12 V & – 12V @250 mA. 3. Variable Voltage Source : 0 to 8 V. 4. Sampling Pulse. 5. Sampler. 6. ADC. 7. Parallel to Serial Converter. 8. Serial to Parallel Converter. 9. Parallel in Parallel out Converter. 10. DAC. 11. Low Pass Filter circuit.
6.	PC TO PC Communication through Optical Fibre Kit: Training kit to setup up a USB based PC to PC link.	The kit should be complete with 1. EO and OE modules 2. Single mode optical fibre. 3. Connectors 4. Necessary patch chords 5. Should be able to support a baud rate of 9600
7.	Solar Cell Trainer Kit: Experiments targeted are Electrical and spectral properties of Solar cells	The solar cell kit should contain the following: 1.Digital Voltmeter and Milliammeter. 2.Solar Cell. 3. Lamp holder assembly with stand. 4. Set of colour filters for measurement of spectral response.