



**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL  
UNIVERSITY, LONERE**

At. Po. Lonere, Tal. Mangaon, Dist. Raigad 402 103 MS (www.dbatu.in)

INVITATION FOR QUOTATION

10 JUN 2026

Our Ref No. : DBATU/store/Ele.Engg/ Synchronous Machine and Three-Phase Generator  
Laboratory Trainer Kits. /2026/2477

Date: 08/06/2026

Quotation For: Synchronous Machine and Three-Phase  
Generator Laboratory Trainer Kits.

Due On: 15/06/2026

Date of Opening: 16/06/2026

Time: 11:30AM

To,

**Sub: QUOTATION FOR THE SUPPLY OF STORE**

Dear Sir,

Your quotation for the items listed overleaf, may please be submitted to the under  
signed, so as to reach this Office not later than: 15/06/2026

While submitting your quotation, the following procedure may please be observed  
and other points borne in mind.

1. The maker's name must be specified.
2. The "Terms and Conditions" for supply and delivery of stores, should be clearly indicated in the quotation, stating whether rates are, inclusive of all taxes, Packing and forwarding charges Freight charges, etc. or not, however rates offered as including all taxes will be more welcome.
3. If packing and forwarding charges are to be charged separately, it should be so clearly stated in your quotation.
4. Please mention clearly whether consignment would be Ex-Godown, Ex-Shop, of F.O.R. dispatching stations. Preferably terms offered as "Delivery of consignment of stores, on F.O.R."
5. Envelope should be super-scribed "**Quotation for reference No..... of dated.....**" It should also be superscripted as per the format given above.
6. The quotation would be opened as per date and timing given above, if desired by you, you may depute an authorized representative with a letter of authority to be present at the time of opening of the quotation at this Office on the aforesaid day, date & time.
7. Your quotation must be valid for a minimum 30 (Thirty) working days from the date of its opening.
8. Quotation received after the date of opening may not be taken into consideration.
9. Items tendered should confirm to the specification shown in the attached list when and where, full or no specifications are indicated against items in the list. Kindly furnish your full specification in accordance with accepted standards against each item tendered. Where reference to catalogue is made, the relevant catalogues/ Pamphlets/ Literature should accompany the quotation.
10. Your quotation should be for all new items and not for second hand.
11. Please state whether items will be available Ex-Stock. If not the minimum period for delivery, or for supplying the items or stores.
12. It should be clearly stated whether **GST**, Insurance, Freight or packing and forwarding charges, or any other taxes and duties, etc. leviable.
13. It would be appreciated if illustrated catalogues/Literature etc. is furnished with the quotation.



14. Expression to as "Complete with standard Equipment" complete with standard accessories "Equipment to" As good as should be avoided. If at all their use is unavoidable then it should be very specifically indicated as to what exactly they mean and what exactly would be supplied under them. Any ambiguity or vagueness should be avoided.
15. For convenience, kindly adopt while quoting the same serial Nos. as given in the list detailed below.

Thanking You,

Yours faithfully,

  
Registrar

Dr. Babasaheb Ambedkar Technological University,  
Lonere

## Specification

### Technical Specifications & Budget

Component	Technical Specifications	Brands
DC Motor-Alternator Set	2HP DC Motor coupled with 1kVA Salient Pole Alternator.	Crompton
Comprehensive Control Panel	Includes Synchronization lamps, Synchroscope,	
	Star-Delta Starter.	BCH Electric
	AC/DC Meters	Meco
	DC Excitation unit	
3-Phase Variable Inductive Load	415V, 1.5 kVAR (for ZPF and Load tests).	
3-Phase Variac	415V, 10A (Crucial for the Slip Test).	
Power Factor Meter	3-Phase, Digital/Analog (for V-curves).	Meco
Static Exciter	0-220V DC/5A Variable supply for Field excitation Included in Panel.	

### Key Experiment Details & Equipment Needs

#### Exp 1 & 2: EMF and ZPF Methods

- **Equipment:** DC Prime Mover, Alternator, Field Rheostat, and a **3-Phase Inductive Load**.
- **Purpose:** To predict voltage regulation. ZPF is more accurate as it accounts for armature reaction and leakage reactance separately.

#### Exp 3 & 4: Reactance Determination ( $X_d$ , $X_q$ & Sub-transient)

- **Slip Test:** Requires a **3-Phase Variac** to apply low voltage to the stator while the rotor is unexcited and driven at a speed slightly different from synchronous speed.
- **Sub-transient ( $X_d''$ ,  $X_q''$ ):** Requires a **Storage Oscilloscope (DSO)** to capture the current waveform during a sudden short circuit (advanced level).

#### Exp 5: V-Curves and Inverted V-Curves

- **Equipment:** Synchronous Motor, Variable DC Excitation, and a **Mechanical Load** (Brake Test).
- **Observation:** Students plot  $I_a$  vs  $I_f$  (V-curve) and PF vs  $I_f$  (Inverted V).

#### Exp 6: Symmetrical Impedances

- **Purpose:** To find Positive (Z1), Negative (Z2), and Zero (Z0) sequence impedances using unbalanced fault conditions. Requires a specialized sequence filtering circuit or calculation from fault data.

**Exp 14: Parallel Operation**

- **Equipment:** Two identical Alternator sets, a **Synchroscope**, and **Three-Lamp dark/bright set**.

**Three Phase Generator Kit**

1. **Open Circuit (OC) and Short Circuit (SC) Tests:** To determine the Synchronous Impedance ( $Z_s$ ) and Voltage Regulation using the **EMF Method**.
2. **Load Test on 3 $\phi$  Alternator:** To study the effect of Load (Resistive, Inductive, Capacitive) on the terminal voltage.
3. **Determination of V-Curves and Inverted V-Curves:** Performed when the machine is running as a Synchronous Motor to study the effect of field excitation on the power factor.
4. **Synchronization of Alternator:** Using the "**Three Dark Lamps**" method or a **Synchroscope** to connect the generator to the infinite bus (Grid).

Component	Technical Specifications	Brands
DC Motor-Alternator Set	<b>Motor:</b> 2 HP (needed to drive 1HP Gen), 220V DC. <b>Alternator:</b> 1 HP (1 kVA), 415V, 3 Phase, 50Hz, 1500 RPM, Salient Pole type.	Crompton Greaves
3 Phase Alternator Control Panel	Includes Voltmeter (0-500V),	Meco
	Ammeters (0-5A AC, 0-2A DC)	Meco
	DC Excitation source.	
	Field Rheostat.	
3 Phase Variable Loading Bank	<b>Resistive:</b> (1.5 kW), <b>Inductive:</b> (1.5 kVAR), and <b>Capacitive:</b> (1.5 kVAR) for power factor study.	
Synchronizing Setup	Three lamp pair arrangement with switches or a Digital Synchroscope.	
DC Starter & Rheostats	3-Point Starter for prime mover; 500 $\Omega$ / 1.2A Field Rheostat.	Benn Electricals,