

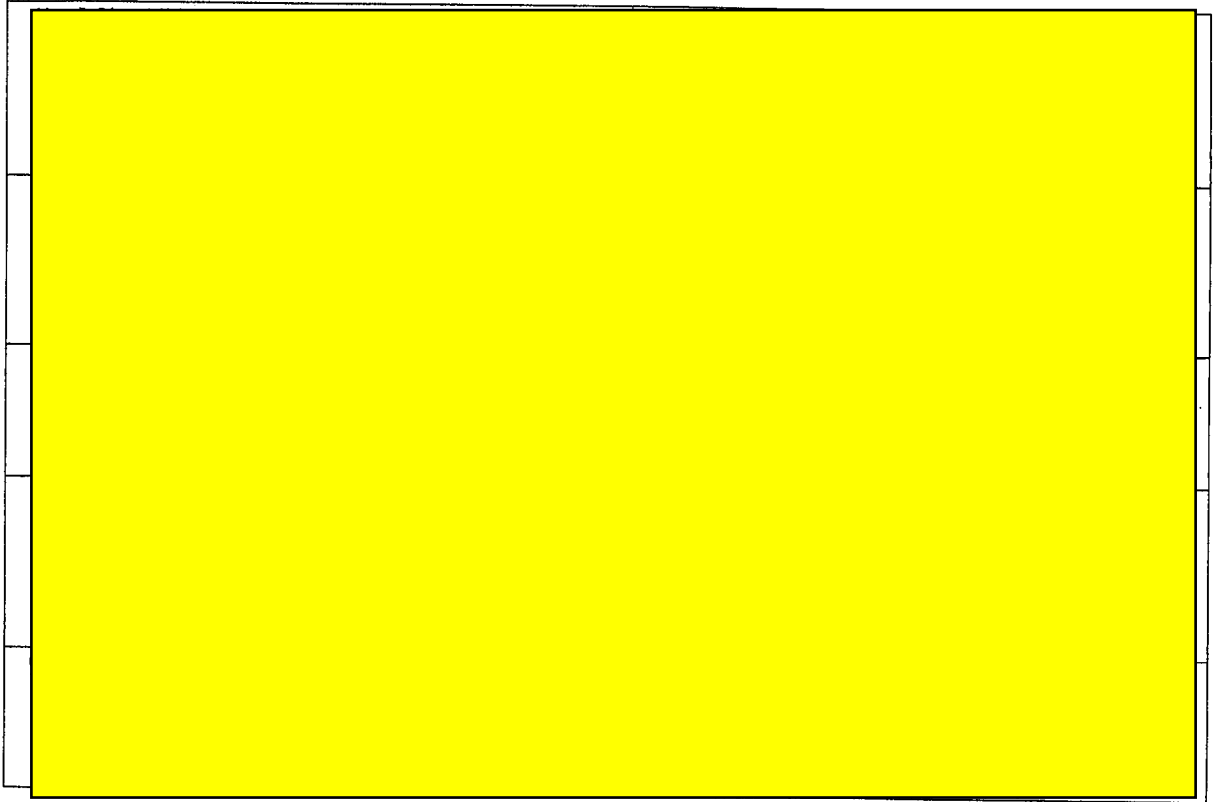
**DIRECTORATE OF TECHNICAL EDUCATION,
MAHARASHTRA STATE**

3, MAHAPALIKA MARG, POST BOX NO. 1967, MUMBAI-400 001
PH: 2264 1150, 2264 1151, 22620601, 22690602, 22621726(D) FAX: 22692102 / 22690007
Telegram:Edutech E-Mail : desk11dte@gmail.com Internet: <http://www.dte.org.in>

No:-11/DTE/Quot.Sciens.Items/2009-10/ 236

Date:- 25/5/09

To,



Sub:- Quotation for the supply of Laboratory Items (Science Group) .

You are requested to send your most competitive quotations for supply of Laboratory Items (Science Group) (List attached) as per the conditions mentioned below. The quotation should be in wax sealed cover and should reach this office on or before **Dt. 2/6/2009 upto 12.00 p.m.**

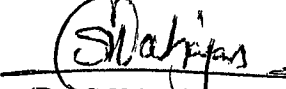
List as attached Page No. 1 to 29

The Sealed cover should be super scribed as "Laboratory Items (Science Group)."
The Quotations will be opened on dated 02/06/2009 at 3.00 p.m.

TERMS & CONDITIONS

1. Rates quotation should be F.O.R. Consignee's Premises.(Door delivery basis only)
2. The validity period for the prices and other referred should be clearly mentioned and it should be minimum for 90 days from the date of opening the quotation.
3. You will have to deliver the stores within 2 weeks from the receipt of order. Late deliveries will be charged @0.5% per week , of the value of stores undelivered
4. This office reserves the right to accept any quotations or reject any or all quotations and to order any of the items in any quantity without assigning any reason thereof.
5. Only latest models should be quoted.. IS/BIS mark items wherever available should be quoted .
6. Payment through Bank conditions will not be acceptable .100% payment is to be effected by the consignee on receipt of the material in good conditions.
7. **Bidders must quote the brands while quoting the prices.**
8. Place of delivery will be at Newly proposed Government College of Engineering, Avsari (Khurd) C/o. Government Polytechnic, Avsari (Khurd), Mahchar, Dist.Pune.
9. **Bill to consignee. Payment will be made by consignee only.**
10. Items not up to the standard even at lowest in price will not be accepted and decision of the under signed in the respect will be final. This office reserves the right to reject any / all quotation(s) without assigning any reasons thereof.
11. Duly filled in quotation must be returned and dropped in the tender Box at Desk No.11

Enclosure : As above


(Dr. S.K. Mahajan)
Director,

Technical Education, M.S.Mumbai.

- Copy to :
1. Dr. D.W.Pande, Prof. College of Engineering, Pune and Co-Ordinator newly Proposed College of Engineering, Awasari for information.
 2. The Principal, Government Polytechnic, Awasari - Khurd, Tal- Mahchar, Dist. Pune for display on Notice Board
 3. Website of Director of Technical Education, M.S. Mumbai.

**EQUIPMENT LIST FOR FIRST YEAR ENGINEERING
FOR NEW GOVT ENGG COLLEGE**

First Year
Semester I

Chemistry Laboratory SEMESTER I for First Year Engineering course:

Sr No	Name of the equipment	Specifications	Units required
1	Digital Microprocessor control balance	Microprocessor control digital electronic balance with 1 mg least count	1
2	Suction pump-filtration assembly	Suction pump Rubber tubing receiving flask of 1 lit capacity glass	1
3	Gas line / hot plate	10 microburners and a LPG Cylinder and routers / hot plate of 1.5 KW	10 points or 4 hot plates
4	Water Purification system	Hot water still/ R-O base purifier/ Ion-exchange resin	1 1 1
5	pH meter	Systronics, three point calibration, glass electrodes, Buffer tablets of pH 4,7,9	Min 5
6	Hot air oven	From ambient-350 C, thermostatic control	1
7	Fume hood	2.5 ft* 2.5 ft * 8 ft with suction and blower arrangement	1

		and steel chimney	
8	Glass ware	BOROSIL glass ware Burette 25 ml Pipette 25ml Conical flask 250 ml, 100 ml Beakers 100,250,500 ml Flat bottom flask 500ml, 1lt, 3ltr, 5ltr, 10ltr Funnels Glass rod Watch glass Volumetric flask 50 ml, 100 ml, 250ml, 500ml Measuring cylinder 10,25,50,100, 250, 500 ml 1 ltr	12 12 12,12, 12,12,12 10 each 50 50 12 each 12 each 5 each 2
9	Chemicals	/	/
10	First aid kit, fire fighter unit	/	/

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FE SEMESTER I - Physics lab. equipment

Sr. No	Specification / Description	Qty	Sets reqd.
1.	Spectrometer with 20SEC Least Count	02	6 each for a batch of 20
	Spectrometer	01	6
	Mercury light source	02	6
	Prism (EDF), Size: 38mm for SK001	01	6
	Prism (EDF), Size: 54x54x54, Height 38mm for SK024	01	6
	Diffraction grating	01	6
	Stand Base 'A' Shaped	01	6
	Bosshead Square (Bilateral)	01	6
	Mild Steel Rod, 500 mm	01	6
	Micrometer slit for SK001	01	6
	Micrometer slit for SK024	01	6
			6
2.	Newton Rings	02	6
	Newtons Ring Apparatus	01	6
	Newtons Ring Set	01	6
	Spherometer	01	6
	Optically Plane Glass Plate (Pair)	01	6
			6
3	Digital Polarimeter - Equipments make EQ-801 Readout: 4 digit LED display for degree measurement Det of angle of rotation: $\pm 180^{\circ}$ (- for levo and + for dextro) Resolution: 0.1 degree Repeatability: $\pm 0.1^{\circ}$ Light source: Monochromatic light (620 nm) of infinite life is used but the circuit is designed to match Na wavelength Size: 150 H X 275 B X 395 L Weight 3.5 Kg Detection of light: electronic sensor and meter which leads to repeatability of 0.1°		6

Sample tube: pvc material, 20cm or 10cm in length Body: fabricated from ABS material		
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Sr. No.	Description of Goods Specifications	Qty
4	Traveling Microscope, Model TVM-02	04
5	Magneto-resistance Set-up, Model DMR - 01	04
6	Quinck's Tube with Stand	04
7	Sample : FeCl ₃	04
8	Four Probe Arrangement, suitable for DMR-01	04
9	Sample: Ge. Crystal (n-type), suitable for DMR-01.	04

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**EQUIPMENT LIST FOR FIRST YEAR ENGINEERING
FOR NEW GOVT ENGG COLLEGE**

First Year
Semester I

Basic Electrical Engineering

Sr. No.	Item	Specifications	Quantity
1	Trolley mounted experimental setup for conducting basic electrical engineering laboratory experiments consisting of the following	As per ANNEXURE- A-1	10
2	A.C. Voltage stabilizer	As per ANNEXURE- A-2	01
3	Single phase Auto transformer	As per ANNEXURE- A-3	03
4	Three phase Auto transformer	As per ANNEXURE- A-4	02
5	A.C. D.C. Ammeter and Voltmeter-Portable-Size	As per ANNEXURE- A-5	2 Each As per ANNEXURE A-5
6	Multi range Multi-parameter portable meters	As per ANNEXURE- A-6	2 Each As per ANNEXURE- A-6
7	Portable Power and Power factor meter	As per ANNEXURE- A-7	1 each as Per ANNEXURE A-7
8	D.C. Rectifier	As per ANNEXURE- A-8	1
9	Phase Sequence Indicator	As per ANNEXURE- A-9	1
10	Maximum demand meter	As per ANNEXURE- A-10	1
11	Static energy meter	As per ANNEXURE- A-11	1

12	LED Type frequency meter	As per ANNEXURE- A-12	1
13	Leakage clamp meter	As per ANNEXURE- A-13	1
14	Clamp meter	As per ANNEXURE- A-14	1
15	Digital multimeter	As per ANNEXURE- A-15	1
16	Megger	As per ANNEXURE- A-16	1
17	Single Phase Transformer	As per ANNEXURE- A-17	1
18	Three phase Induction Motor	As per ANNEXURE- A-18	1
19	Wire wound Rheostat	As per ANNEXURE- A-19	3

ANNEXURE: A

Technical Specifications

A-1) Trolley mounted experimental set up for conducting basic electrical engineering laboratory experiments

Sr. No.	Item description and Specifications	Quantity
	Trolley mounted experimental setup for conducting basic electrical engineering laboratory experiments consisting of the following	
1	Three phase isolation transformer 415 V, 5A	1
2	Single Phase Variac Input: 230VAC, 50 Hz Output: 0-260 VAC, 50 Hz	2
3	D.C. Power supply with Single phase bridge rectifier, 0-110VDC output	2
4	Step down transformer 10:1 for conducting OC and SC tests on transformer	1
5	Set of instruments for measurement of various parameters: Digital voltmeter: 0-600V with AC/DC selected switch- 1 no. Analog AC/DC voltmeter: 0-600V- 1 no Digital Ammeter: 0-10 A with AC/DC selector switch- 1 no Analog AC/DC ammeter- 0-10 A- 1 no Single phase digital Wattmeter- 1 no Single phase analog Wattmeter- 1 no Digital frequency meter- 1 no Analog frequency meter- 1 no Digital power factor meter: 0.1 to 1 lead/lagging 5% accuracy - 1 no Analog Power factor meter- 1 no Digital multimeter- 1 no Digital L-C-R meter- 1 no Single phase static energy meter- 1 no Digital stop watch with start and stop push button - 1 no	1 set
6	Load Banks: Resistive, Inductive and capacitive load banks with suitable values and ratings will be required with the test set up. Torroidal rheostat as a variable resistor, inductor with multiple tappings, variable capacitor with selector switch. Fixed value R, L, and C components with appropriate voltage, current and power rating will be supplied with the set up for conducting various experiments. Set of loads to study effect of unbalance supply.	1 set
7	Panel: Sheet metal fabricated panel to house all the instrumentation and with number of components to store various components supplied	1 set

	with the test set up. Panel interior and exterior will be power coated with siemens gray and VIP blue colours. Good earth will be provided on the panel. Panel is trolley mounted for ease of handling. Panel includes different types of industrial plugs and sockets for single phase and three phase power distribution application.	
8	Set of push buttons ON and OFF with contactor to study contactor/ relay logic	1 no
9	Protection devices: Panel will be supplied with over current protection circuits consisting of MCB, OLR etc. ELCB will be provided for protection against any earth connection faults.	1 set
10	12 V Automotive battery as a power source for DC experiments and study of battery charging circuits.	1 no
11	Wiring: All the electrical wiring will be done as per industry standard practices with proper ferruling on each conductor. All cables used will be of Jhonson/Polycab or equivalent.	1 no
12	Operating instruction and maintenance manual is required with the equipment.	1 no
13	List of few experiments which should get conducted with the test set up- <ul style="list-style-type: none"> • Verification of Thevenins, Superposition, Nortons theorem • R-L-C series and parallel circuits • Calibration of single phase energy meter • To study charging and discharging of capacitor and battery • To study the series and parallel resonance in a.c. circuits • To measure power and power factor in a single phase AC circuits • Open circuit (OC), Short circuit (SC) and Load test on a single phase transformer • To measure resistance, inductance, capacitance and Q by bridge method • Measurement of a power in three phase circuit using one or two wattmeter method • Line and phase voltage, current relationships in Star and delta connections 	

A-2) A.C. Voltage stabilizer

Type	Indoor, Floor Mounting.
Cooling	Air - Oil Cooled.
Input	160 - 260V / 180 - 250V, 1 Phase AC. 300 - 460V / 360 - 460V, 3Phase, 4 Wire (or 3 Wire if required) AC (Balanced or Unbalanced).
Output	230V / 240V \pm 1%, 1 Phase AC. 380V / 400V / 415V \pm 1%, 3Phase AC.
Capacity	15 kVA
Frequency	50-Hz.
Insulation Resistance	Not less than 5 Mohms at 500V DC
Dielectric test	1.5kV RMS for 1 minute.
Operating temperature	0°C to 50°C

- Input & output voltages, other than specified above, are available on specific request.
- For 3 Phase balanced supply system, a common controller, connected to any one phase is employed.
- For 3 Phase unbalanced supply system, 3 individual & independent controllers, one for each of the 3 Phases, are employed
- Oil should be Transformer Oil

A-3) Single phase Auto transformer

Model	Portable Enclosed Manual (Air Cooled) — P
Operating voltage	For Single Phase - 240V AC, 50-60 Hz, 1-ph
Current Ratings	For Air Cooled models, the ratings are as shown below.
Maximum Current	10 A
Continuous Current	9 A
Operating temperature	0° - 45°C.
Insulation resistance	Not less than 5 Mohms at 500V DC.
Dielectric test	2.5kV RMS for 1 minute.

- The basic Dimmerstat is meant for operation from a nominal input voltage of 240V 1ph AC & can give output voltage anywhere between 0 to 240V or 0 to 270V AC by simple transformer action.
- As output voltage is continuously variable, Dimmerstats are rated in terms of current that can be drawn from the output.

A-4) Three phase Auto transformer

Model	Portable Enclosed Manual (Air Cooled) — P
Operating voltage	For Three Phase - 415V AC, 50-60 Hz., 3-ph - 4wire
Current Ratings	For Air Cooled models, the ratings are as shown below.
Maximum Current	10 A
Continuous Current	9 A
Operating temperature	0° - 50°C.
Insulation resistance	Not less than 5 Mohms at 500V DC.
Dielectric test	2.5kV RMS for 1 minute.

- The basic Dimmerstat is meant for operation from a nominal input voltage of 415V AC, 50-60 Hz., 3-ph - 4wire.
- As output voltage is continuously variable, Dimmerstats are rated in terms of current that can be drawn from the output.

A-5) A.C. D.C. Ammeter and Voltmeter Portable Size

Type	Scale	Range	Accuracy
D.C. μ -Ammeter	Triple	250 μ A, 500 μ A, 1000 μ A	
D.C. MILLI-Ammeter	Triple	10mA, 100mA, 1000mA,	
D.C. Ammeter	Triple	1A, 10A, 25A (INT. SHUNT)	
D.C. MILLI-Voltmeter	Triple	50mV, 100mV, 1000mV.	
DC Voltmeter	Triple	1V, 10V, 600V.	

			1.0%
A.C. Milli-Ammeter	Triple	10mA, 50mA, 1000mA	1.5%
A.C. Voltmeter	Triple	10V, 100V, 600V	
A.C. Ammeter	Single	1A, 10A, 25A	1.5%
A.C. Voltmeter	Single	50 V, 250V, 600V.	

- Portable Moving Coil DC, Moving Coil rectifier type AC, Moving Iron AC ammeters & voltmeters suitable for use laboratories & for field operation.
- Specially designed to be operated in horizontal position (also in inclined position upto 45°) & can be carried along safely.
- Instruments with high resistance to shock & vibrations.

A-6) Multi-range and Multiple parameter (Medium size bakelite housing) Portable instrument

Type	Scale	Range	Accuracy
Moving Iron AC Volt Ammeter	Triple	0 - 50/250/500V & 0 - 2.5/10/25A	1.5%
Moving Coil DC Volt Ammeter	Triple	0 - 50/250/500V & 0 - 2.5/10/25A	
Moving Coil DC & AC Voltmeter	Quadru- ple	0 - 1.5/15/150/600V-DC 0 - 6/60/300/600V AC	
Power Factor Meter 1 - Phase	Single	0.5 Lag - Unity - 0.5 Lead at Single Voltage 110V/220V/440V & Single Current 1A/5A	
Power Factor Meter 3-Phase - 1Element	Single	0.5 Lag-Unity-0.5 Lead at Single Voltage 110V/220V/440V & Single Current 1A/5A	

- Portable Moving Coil DC, Moving Coil Rectifier type AC, Moving Iron AC ammeters & voltmeters and can be used in conjunction with transducers for measurement of frequency, power factor and low power factor wattage. Single phase dynamometric instrument is used for measurement of power at Unity Power Factor (UPF).

A-7) Portable Power and Power factor meter

Type	Potential Coil (V)	Current Coil (A)	Accuracy
Watt Meter With	75/150/300/600	1, 2.5/5/10/20	1.5%

Low Power Factor			
VAR Meter	75, 150, 300, 600	0.5, 5, 10, 20	1.5%

- Instruments with accuracy class 0.5 for 1 Ph Watt, 1.5 for 3Ph, 2° for PF.
- Robust housing suitable for schools, workshops and field operations for continuous use.

A-8) D.C. Rectifier

- Simple / rugged construction; in adequately thick sheet steel enclosure / tank.
- Very high efficiency for plating type rectifier - upto 86%, for battery charger - upto 80%.
- Operating temp. -45°C.
- Dimmerstat controlled / SCR controlled / mag-amp controlled.
- Very low ripple content $\pm 5\%$ for 3Ph units, can be provided better for special application.
- Various protective features like fuse protection, visual & audible alarms with tripping, can be provided

A-9) Phase sequence indicator

Type	Electro-mechanical
Operating Voltage	50V to 500V AC
Frequency	25 Hz to 60 Hz.
Insulation resistance	Greater than 20 Mohms at 500V DC
Dielectric strength	2kV RMS for one minute
Operating temperature	-10°C to 55°C

- It is a rotating disc type instrument. The disc rotates in clockwise direction when correctly connected to incoming three phase power supply. Black arrow on white disk indicates correct phase sequence. If rotation is anti-clockwise then it indicates that one of the phases is reversed. It is suitable for use only in horizontal position and should not be left in circuit. Three, 1 meter long red, yellow, blue colour leads with clips and sheaths are provided.

A-10) Maximum demand meter

Type	BIMETALLIC; ANALOGUE AMMETER.
Operating Current	1 Amp or 5Amp
Frequency	40 ~ 65Hz.
Accuracy	$\pm 3\%$ for resettable red pointer (Bimetallic).
Thermal LAG (SETTING TIME)	15 minutes (standard) & 8 minutes (on special request).
VA Burdon	Approx. 3.5VA for Bimetallic Ammeters & Approx. 4VA for Bimetallic And Moving Iron Ammeter.
Insulation resistance	Greater than 20 Mohms at 500V DC
Dielectric test	2kV rms for 1 minute.

- RMS measurement of maximum current.
- Long current peaks are registered.
- Red pointer to indicate maximum current reached
- Analogue Indication.
- 20% overload capacity.
- Instantaneous current measurement.
- Sturdy movement.

A-11) Static Energy meter

Wiring Method	Single Phase 3 Phase 3 Element 4 Wire, 3 Phase 2 Element 3 Wire.
Operating Voltage (Range)	110V Line voltage (85 to 130V) 240V Phase Voltage (180V to 270V) 415 Line Voltage (330V to 470V)
Operating Current (Range)	1Amp (0.05 to 1.2-Amps) - 5Amps (0.25A to 6Amps)
Signal Frequency	45Hz TI 55Hz
Operating Power Factor	0.5 (Lag) - Unity - 0.8 (Lead)
Accuracy	1.0%
Display	6 Digit Mechanical Counter, Tamper proof, Non-resettable.
Operating Temperature	0° C to 55° C

- True RMS measurement.
- Isolated Solid - State Pulse Output Or built - in RS - 485 interface for communication with PC.
- Reverse direction indication.
- Tamper - proof
- Battery Backup facility to retain the data for six months. (only for kWh meter having in-built RS- 485

A-12) LED Type Frequency meter

Type	Electronic
Operating Voltage	110V~125V, 220V-250V, 380V~440V.
Power Consumption	Less than 3VA (Single scale), Less than 6VA (Double scale).
Measuring Method	Time measurement between consecutive cycles.
Display	Box LED, Colour Red/Green, Size 6.3 X 3.7mm
Sampling Rate	2-3 samples/sec.
Response Time	Less than 1 sec.
Insulation Resistance	Greater than 20 Mohms at 500V DC.
Dielectric strength	2kV RMS for 1 minute.

- No vibrating parts.
- No aging effect.
- Faster response.
- Lighter in weight.

- Low power consumption
- No effect of external vibration
- Visible in dark & from distance.

A-13) Leakage Current Clamp Meter

Display	With LED
Measurement Cycle	2 times/second (Digital display), 12 times/second (Bar-graph display)
Range switching	Auto-range
Ambient temperature and humidity	0 °C to 50 °C, 80 % R _H or less (no condensation)
Temperature coefficient	0.05% of range/°C or less (within the ranges of 0 °C to 18 °C and 28 °C to 50 °C for measurement of 0-50 A)
Circuit voltage	<300 Vrms
Withstanding voltage	3.7 Kv a.c
Battery type	3 V Lithium battery (button cell)
Battery life	Approx. 90 hours (when continuously used)
3 mA	Resolution: 0.001 mA Accuracy: 1% + 5 Max Permissible current: 60 A rms
30 mA	Resolution: 0.01 mA Accuracy: 1% + 5 Max Permissible current: 60 A rms
30 A	Resolution: 0.01 mA Accuracy: 1% + 5 Max Permissible current: 60 A rms

A-14) Clamp meter

Voltage DC	Range: 0 - 400 V Resolution: 0.1 V Accuracy: 1%
Voltage AC	Range: 0 - 600 V Resolution: 1 V Accuracy: 1.2 %
Current AC	Range: 0-400 A Resolution: 0.1 A Accuracy: 1.8 %
Resistance	Range: 0-400 ohm Resolution: 0.1 ohm Accuracy: 1 %
Continuity	<=30 ohm

A-15) Digital Multimeter

Voltage DC	Range: 1000 V Resolution: 0.1 V Accuracy: 1%
Voltage AC	Range: 1000 V Resolution: 0.1mV Accuracy: 0.5%
Current DC	Range: 10 A Resolution: 0.01 A Accuracy: 0.4%
Current AC	Range: 0-10 A Resolution: 0.01 A Accuracy: 1.2%
Resistance	Range: 0-50 M-ohm Resolution: 0.1 ohm Accuracy: 0.4%
Continuity	<=30 ohm
Capacitance upto 10000 uF and frequency upto 200KHz With diode and transistor testing facility	

A-16) Megger

Range: 0-infinity Megaohms, 500V DC, Hand driven generator

A-17) Single Phase Transformer

220/110, Single phase 1 kVA transformer

A-18) Three phase Induction Motor

5 hp, 7.2 A, 415 V, 3 Phase, 50 Hz, 1440 rpm, Class F, Squirrel cage rotor

A-19) Wire wound Rheostat

720 Ohm, 5 A, 230 Volts, wire wound type