

Name of the Trade		LAB ASSISTANT	
S.No.	Name of the item	Std List No.	Specifications
(i)	(ii)	(iii)	(iv)
1	Analytical balances of different makes (with rider, optical reading, one pan	1	Weighing digital balance 0.1 mgm-100 gm: Single Pan Analytical Balance Type Capacity: 200 gm,Readability: 0.0001gm Pan Diameter :80 mm It should have unit selection facility and percent weighing. With Draft shield, Dust Cover & RS – 232 Connection.
2	Digital balance	2	Weighing digital balance 1.0 mgm-100 gm: Single Pan Analytical Balance Digital Type Capacity : 200 gm,Pan : SS,Display : LED/LCD It should have unit selection facility and percent weighing. With Draft shield, Dust Cover
3	Balance (tech.) to 1 kg	3	Single Pan Digital Balance Type Capacity : 1000 gm Readability : 0.1gm. Pan Diameter : 220 X 140 mm approx.
4	Hand centrifuge for determination of fat in milk (Gerber)	4	Smooth & Trouble Free Working,Solid Construction,Electric motor AC 50 cycles, 220/230V,Single phase, 1440 RPM,
5	Auto-clave electrically heated	5	Laboratory autoclave vertical used for sterility under saturated steam pressure at any selected point between 10-20psi. Electrically operated. These are double walled units with inner chamber made of stainless steel. Lid having radial locking system complete with water level indicator pressure guaze,steam release cock, Spring loaded safety valve,pilot lamp and heating element.supplied complete with ss basket cord and plug work on 220/230 volts ACsupply fitted with automatic pressure control switches 40ltr capacity, Dia * Height in mm = 300 * 500
6	Centrifuges electrical	6	Capacity: 4 x 15ml Type of Head: Swing out.No. of Tubes: 4 Max. speed: 3500 RPM Max. RCF: 1750 W X D X H: 295mm x 295mm x 250mm
7	Vacuum pump (central, for 20 places)	7	oil sealed,air cooled, V-belt driven and mounted on base plate with belt guard etc , double stage, displacement: 32 lt/min, motor HP 0.25 AC Single phase
8	Vacuum pump mounted on moving tables	8	Lieght weight, portable single stage 50 lt/min displacement, ultimate vacuum 0.05mm bar, motor 0.25 HP.
9	Electric drying ovens (200°C)	9	For the temperature upto 250 deg centigrade ,double walled inner chamber of anodized stainless steel , thermostat for maintaining the the exact controll of heat , inner chamber size 18" * 18" * 18"

10	Furnaces (Muffle ovens)(1100°C)	10	*Upper 7 Lower Chamber :- 300(W) X 200(H) X 200 (D), thermally and electrically insulated with refractory brick lining and MS door handle. *Furnace shell :- MOC: MS, Shape : Rectangular Cubical Fabricating using heavy guage CRCA sheet and total body in mounted of caster wheel, Heating Elemnet ; silicone Carbide (Si-C) Rod, max Temperature: 1200 deg C., Insulation material : 100 mm of cerawool. *Control panel :- Controller : On-off type digital temperature indicator cum controller of 1200 deg C. Range with suitable temperature, sensor / Thermocouple with connector centrally placed for measuring teperature. Transformer : Suitable transformers for switching both chambers, Power connection : Operating Power 440 V, 50 Hz(+ 10%)AC Connector : 4 pin 15 amp. Metal plug supply cord : 2 m Long suitable type cable electrical witching and fuses. *The furnace shall be painted with good quality epoxy paint over a layer of red oxide. The above furnace will be supplied with 2 set of operating cum instruction and maintenance manual for academic purpose.
11	Water baths(6 places)(electrically heated)	11	Double walled, glass window on both sides, fitted with PID digital indicator cum controller complete with motorised stirrer with electronic control. Working chamber of stainless steel 17" *15" * 15"
12	Sand bath (to be fabricated)	12	Variable speed 180 RPM 4" Stroke for one cylinder
13	Refrigerator (4,5 cu. Ft.)	13	4,5 cu. Ft.
14	Chromatographic equipment (paper, column, thin layer)(if available indigenously)	14	All PAL HPLC sample loaders can be equipped with injection valves built for pressures up to 15,000psi (1000 bar). 6 - or 10-port design available. Various bore sizes for nano- and micro applications,*Three flow ranges can be covered with this one high performance LC pump.Two XYZs and two syringes or other tools enable a Twin PAL to be a extremely versatile robotic sampling and liquid handling device.
15	Stirrers with motors, 230V, AC, capacity 5 – 7 liters	15	Laboratory stirrer with PMDC motor for higher torque even at low speed. Motor with an arrangement to affix glass stirring rod.All fitted on a heavy and stable base with thick rod at centre, having the provision for up & down & to & fro adjustment, speed controller (potentiometer) to control upto minimum speed. Maximum 475 RPM .
16	Magnetic stirrers (with heating plate) 2 litres capacity	16	Fitted without chuck 1/20 HP universal motor with arrangement for the adjustment of height and space, controlled speed for continous stirring with chuck arrangement with hot plate , extra heavy body of mild steel white stoving paint, with electronic speed controller, on heavy casted base.
17	Mortar , 100mm, porcelain with pestle	17	Outside glazed size 5"
18	Heating plates (electric) 1000 watt	18	Mounted on thick MS sheet body a smooth surface cast iron top, heated with an electric element of oxidised kanthal wire. Laid under the plate. A three stem rotary switch works on 220/230 AC controls heating. The top is finished with heat resistant black and the body is finished with white blue stoving, round dia 7.5" with energy regulator
19	Mortar 150 mm. steel / cast iron	19	150 mm. outside glazed steel / cast iron

20	Desiccators 160 mm. dia.	20	Dessicator with lid, vacuum, die pressed, made of borosilicate neutral glass (with porocelain perforated plate and glass sleeve 160 mm. inner dia.
21	Desiccators vacuum	21	Dessicator with lid, vacuum, die pressed, made of borosilicate neutral glass (with porocelain perforated plate and glass sleeve 210 mm. inner dia.
22	Electric heating plates (for Soxleth)	22	Soxhlet's extraction heating unit for flask 250 ml capacity without glass parts with OFF/ON switches and individual energy regulator (Hot plate type) 6 test.
23	Heating mantles (universal)	23	Made from heavy count glass yarn provided with triple sleeve for kanthal oxidised coil for more life and safety, complete with energy regulator, 500 ml capacity 200 watt.
24	Borer for stoppers with sharpener	24	Cork borer set of 6 consists of sequentially numbered, nested tubes that start at 4.5mm (3/16") O.D. and gradually increase in size. A steel punch is included with each set.
25	Clamps with spring or screw	25	Universal clamp die pressed, felt lined can hold upto 50mm and 70 mm dia all black painted or zinc plated
26	Cork press	26	Cork boring machine with cork borer set of 12 and an ejector hand operated with screw type shaft.
27	Scissors	27	Superior quality sharp ends, all Stainless Steel 5" size
28	Bunsen's burners	28	It should be giving narrow, pointed, long flame, made of heavy brass tube chrome plated screw type air regulator Height:150 mm approx and Tube diameter: 12 mm.
29	Set sieves 20 – 200	29	brass frame & G.I Frame Sieves of dia 200mm, 300mm.Normally brass sieves are manufactured in 200 cm dia and frame is spun brass, joint less.The Sieve cloth used is standard SS or phosper bronze wire mesh
30	Shaking machines for sieves & bottles	30	Vibration type variable speed vortex accentric motor driven neoprene cup impart vigrous agitation to tubes or small flask with speed control through variac system. With touch in start shaking starts immediately on pressing the test tube and for 30.5 cm (12") Sieves
31	Steam generator (copper) for steam distillation	31	Steam Generators. Cylindrical copper vessel 180 x 115 mm height x diameter, with filling tube, steam vent and vertical tube terminating the chute passing
32	Hot water funnel	32	Plain, 60° Angle, Long Stem. MOC : Borosilicate Glass Diameter :65 mm
33	Extraction thimbles	33	Extraction Thimbles Cellulose 33 mm OD x 80 mm H , Glass microfiber thimbles , Quartz microfiber thimbles, Soxhlet thimble, Soxhlet filter, 25 pack
34	Glass tubes & rods of different diameter	34	Borosilicate glass rods for stirring both ends flat with different dia (6",8" 10"), round bottom test tube 25 ml with rim,graduated and 50 ml capacity OD * L* WT mm = 18 * 150 * 1.2 and 25 *150 *1.2
35	Rubber tubes for water, gas & vacuum, stopper, rubber each glass, plastic & cork of different sizes	35	Laboratory rubber tubing coil of 10 meter approximate bore size 8mm with wall thickness1.5 mm (or other sandard sizes used maximum in the labs), rubber autoclave stopper for over flange, plain for test tube of different dia 12,15,18mm.
36	Tongs (forceps) nickel for crucibles & weights	36	Crucible tongs die pressed 6" length and 8" made of stainless steel.
37	Tongs long for crucibles (muffle furnace)	37	Crucible tongs die pressed 15" & 18" for muffle made of stainless steel □

38	Spatulas nickel	38	Spatula made of nickel or stainless steel one end flat and one end spoon 8"
39	Test tube stand for 10 – 12 test tubes	39	Test tube stand Alluminium made from thick hardened gauge sheet highly anodize for 12 test tube of dia 18mm and 25 mm
40	Tripods	40	Made of heavy cast iron top triangular three balanced screwed legs size 8" * 4"
41	Asbestos wire gauge	41	Asbestos wire guaze heavy type superior quality Size : 6" x 6".
42	Wire gauge (without asbestos)	42	Wire guaze heavy type superior quality Size : 6" x 6".
43	Cork rings	43	Ring size: 1 1/4" x 1/4" x 1/4" hole
44	Test tube holders	44	test tube holder for holding large dia upto 25 mm test tube . Superior quality
45	Clamp holders	45	Rod Size Up to 3/4", Mild Steel With Plastic Cover
46	Clamps	46	universal clamp made of moulded aluminium alloy cork lined jaws can hold 70mm article, powder coated.
47	Rings with clamps for filtering & heating	47	Retort clamps brass moulded, rubber cover /cork lined cylindrical
48	Stands	48	Rod Size Up to 3/4",
49	Stands with clamps for burettes	49	Stand made of cast iron base size 6" *4" rod size 18" * 3/8" (length * dia), base epoxy col. painted and rod of mild steel AND burett clamp replacement of routine type moulded aluminium alloy. Fisher clamp made of thick sheet. All die pressed symmetrical non-breakable. One holds the burette tube and other presses it due to spring force. Boss head can accomodate upto 18mm, dia rod totally chrome plated.
50	Pipe clay Triangles	50	wires with ceramic or catlinite tubing, allowing it to support heatproof crucible containers while providing direct heat.
51	Apparatus for distilling for deminerlizing water	51	Distillation apparatus vertical gives pyrogen free distilled water with special double walled condenser, all interchangeable fitting with automatic ejecting arrangement and water level device for 3000ml capacity.
52	Crucible nickel 30 mm. dia, height 40 mm., rabless brushes, liquid soap, acid cleaning mixture for glassware, glass wool, etc.	52	made of Nickel 30 mm. dia, height 40 mm.,
53	Erlenmeyer flasks 250 ml.	53	250 ml capacity Volumetric flask with interchangeable stopper having tolerance 0.150 stopper size 14/15
54	Erlenmeyer flasks 500 ml.	54	500 ml capacity Volumetric flask with interchangeable stopper having tolerance 0.250 stopper size 19/20
55	Burettes 25 ml.	55	25 ml capacity class A Burette with straight bore stopcock accuracy as per I S 1997:1982 with 0.1 ml subdivision
56	. Burettes 50 ml.	56	50 ml capacity class A Burette with straight bore stopcock accuracy as per I S 1997:1982 with 0.1 ml subdivision
57	. Pipettes 10 ml.	57	10 ml capacity class A pipette with one mark for transfer, volumetric, tolerance ± 0.020 ml.
58	. Pipettes 25 ml. .	58	25 ml capacity class A pipette for transfer, volumetric accuracy as per IS 1117:1975 (or tolerance ± 0.03 ml)
59	. Pipettes measuring 0 to 5 ml.	59	0 to 5 ml. glass(borosil) capacity class A pipette for transfer, volumetric accuracy as per IS 1117:1975
60	. Pipettes measuring 0 to 10 ml	60	Pipette measuring graduated serological accuracy class A having subdivision 0.10 ml and tolerance 0.05 ml

61	. Pipettes measuring 0 to 1 ml.	61	Pipette measuring graduated serological accuracy class A having subdivision 0.1 ml and tolerance 0.006 ml
62	Pipettes micro 0 to 2 ml.	62	Pipette measuring graduated serological accuracy class A having subdivision 0.1 ml and tolerance 0.01 ml
63	Pipettes 1ml. (graduated)	63	Pipette measuring graduated serological accuracy class A having subdivision 0.01 ml and tolerance 0.006 ml
64	. Each pipettes automatic 1, 2, 5, 10 ml..	64	Hand grip for a perfect handling, Digital display for volume control, Thermo-isolation handle, Integrated point ejector,automatic 1, 2, 5, 10 ml.
65	. Flasks for distilled water 500 ml..	65	Round bottom, long neck flask with interchangeable stopper 500 ml capacity
66	. Vacuum pipettes .	66	1, 2, 5, 10 ml. glass(borosil)
67	. Measuring cylinders 25 ml.	67	with spout and break resistant collar class A with work certificate capacity 25 ml having subdivision 0.5 ml tolerance $\pm$ 0.25ml
68	. Measuring cylinders 50 ml.	68	with spout and break resistant collar class A with work certificate capacity 50 ml having subdivision 1.0 ml tolerance $\pm$ 0.50ml
69	Measuring cylinders 100 ml. .	69	with spout and break resistant collar class A with work certificate capacity 100 ml having subdivision 1.0 ml tolerance $\pm$ 0.50ml
70	. Measuring cylinders 250 ml. .	70	with spout and break resistant collar class A with work certificate capacity 250 ml having subdivision 2.0 ml tolerance $\pm$ 1.00ml
71	. Measuring cylinders 500 ml.	71	with spout and break resistant collar class A with work certificate capacity 500 ml having subdivision 5.0 ml tolerance $\pm$ 2.50ml
72	Measuring cylinders 1000 ml. .	72	with spout and break resistant collar class A with work certificate capacity 1000 ml having subdivision 10.0 ml tolerance $\pm$ 5.00ml
73	. Volumetric flask 100 ml.	73	volumetric (measuring) with interchangeable stopper 100 ml capacity having tolerance $\pm$ 0.100 ml and stopper size 14/15
74	Volumetric flask 250 ml.	74	volumetric (measuring) with interchangeable stopper 250 ml capacity having tolerance $\pm$ 0.150 ml and stopper size 14/15
75	. Volumetric flask 500 ml.	75	volumetric (measuring) with interchangeable stopper 500 ml capacity having tolerance $\pm$ 0.250 ml and stopper size 19/20
76	. Volumetric flask 1000 ml.	76	volumetric (measuring) with interchangeable stopper 1000 ml capacity having tolerance $\pm$ 0.400 ml and stopper size 19/20
77	Weighing bottles polyethylene or glass 50 ml.	77	weighing bottle with interchangeable stopper capacity 50 ml size 50*50mm(OD*HT)
78	Weighing bottles polyethylene or glass 100 ml.	78	weighing bottle with interchangeable stopper capacity 100 ml size 45 * 80mm(OD*HT)
79	Funnels with regular & long stem 7 cm. dia.	79	Funnel diameter 75 mm 60 deg angle with long stem
80	. Funnels 4 cm. dia.	80	Funnel diameter 38 mm 60 deg angle with long stem
81	Funnels 9 cm. dia.	81	Funnel diameter 100 mm 60 deg angle with long stem
82	. Funnels Buchner different sizes 10 to 25 cm. dia. .	82	buchner funnel with sintered disc of porosity G-1 plain stem
83	. Funnels Hirsch	83	10 mL, 30 x 50 mm , 10 mmglass(borosil)
84	Funnels separatory 50 ml	84	50 ml glass(borosil) 60 deg angle with stem dia 50 mm
85	Funnels separatory 100 ml.	85	100 ml glass(borosil) 60 deg angle with stem dia 100 mm
86	. Funnels separatory 250 ml.	86	250 ml glass(borosil) 60 deg angle with stem dia 100 mm
87	. Funnels separatory 500 ml.	87	500 ml glass(borosil) 60 deg angle with stem dia 100 mm
88	Funnels for filter crucibles & Gooch crucibles with rubber rings	88	32 x 39 mm glass(borosil) 30 cm stem.

89	Beakers 100 ml. Corning	89	100 ml glass(borosil) beaker with spout, graduated, graduation interval 25 ml.
90	Beakers 250 ml. Corning	90	250 ml glass(borosil) beaker with spout, graduated, graduation interval 50 ml.
91	Beakers 500 ml. Corning	91	500 ml glass(borosil) beaker with spout, graduated, graduation interval 100 ml.
92	Beakers 600 ml. Corning	92	600 ml glass(borosil) beaker with spout, graduated, graduation interval 100 ml.
93	. Beakers 1000 ml.	93	1000 ml. glass(borosil) beaker with spout, graduated, graduation interval 200 ml.
94	Watch glasses 5 cm.dia.	94	5 cm.dia. glass(borosil)
95	Watch glasses 7.5 cm.dia.	95	7.5 cm.dia. glass(borosil)
96	. Watch glasses 10 cm.dia.	96	10 cm.dia. glass(borosil)
97	Dishes evaporating 5 cm. dia. porcelain, glass	97	Dishes heavy type 20 ml capacity, 5 cm.dia glass(borosil)
98	Dishes evaporating 7.5 cm. dia.	98	Dishes heavy type 60 ml capacity, 7.5 cm. dia. glass(borosil)
99	Dishes evaporating 10 cm. dia. flat bottom	99	Dishes heavy type 100 ml capacity, 10 cm. dia. flat bottom glass(borosil)
100	. Dishes evaporating 15 cm. dia.	100	Dishes heavy type 150ml capacity, 15 cm. dia. glass(borosil)
101	Dishes evaporating 20 cm. dia.	101	Dishes heavy type 300ml capacity, 20 cm. dia. glass(borosil)
102	. Thermometers 0 to 110°C	102	0 to 110°C mercury filled 30 cm long having division 1/1 accuracy $\pm$ 1 division
103	Thermometers 0 to 250°C .	103	0 to 250°C mercury filled 30 cm long having division 1/1 accuracy + 1 division
104	Thermometers 0 to 350°C .	104	0 to 350°C mercury filled 30 cm long having division 2/1 accuracy + 1 division
105	Thermometers for drying oven	105	L shaped size 200 mm * 200 mm, mercury in glass. Accuracy $\pm$ division upto 360 deg C division 2 deg C
106	Boiling flasks with round bottom 100ml.	106	Round bottom, long neck flask 100 ml capacity
107	Boiling flasks with round bottom 250ml.	107	Round bottom, long neck flask 250 ml capacity
108	Boiling flasks with round bottom 500ml. for each distilling flasks 50 ml., 100ml., 250 ml	108	Resin Reaction round bottom kettle 500 ml.
109	Boiling flasks with round bottom 500ml. for each distilling flasks 50 ml, 100ml, 250 ml – Writz and others	109	Resin Reaction round bottom kettle 500 ml.
110	Filtering flasks 250 ml.	110	Conical graduated 250 ml capacity 50 ml graduated interval.
111	Filtering flasks 500 ml.	111	Conical graduated 500 ml capacity 100 ml graduated interval.
112	. Filtering flasks 1000 ml.	112	Conical graduated 1000 ml capacity 200 ml graduated interval.
113	. Flasks soxhlet with condensers .	113	glass(borosil) with side tube capacity 250 ml
114	. Flasks kjeldahal 250 ml.	114	glass(borosil) Flask capacity 250 ml, long neck round bottom
115	. Condensers liebig 30 mm. long	115	liebig condenser, effective length 30 mm glass(borosil)
116	Condensers liebig 50 cm. long	116	liebig condenser, effective length 50 mm glass(borosil)
117	Condenser bulb type 30 cm. long	117	condenser bulb shape 30 cm long suitable for 1000ml spoutless, tall form beaker
118	Condenser spiral type 20 cm. long	118	Coiled distillate type condenser effective length 200mm.
119	Connecting tubes for khejeldahal distillation	119	kjeldhal digestion tubes with constriction on top tube size 24 * 250 mm

120	. Ventiles for volumetric analysis (KCI 03, etc.	120	Length Of Blade 350mm Cut Round 150mm, Cut Square 200 X 200 ..
121	CO2 determination apparatus (Schrotter)	121	The instrument full scale range shall be between 8 to 10 % of CO.
122	. Gas generator (Kipp) 500 ml.	122	500 ml.
123	Gas washing bottles (Dreshsler)	123	Dreshle's type, interchangeable joints 250 ml capacity.
124	. Drying tubes with one bulb	124	Drying tubes with one bulb 1–2 cm wide and 5–10 cm long
125	Crucibles porcelain 5 cm dia, height 4 cm indigenous .	125	Porcelain 5 cm, dia, height 4 cm capacity 30 ml
126	. Crucibles quarts 5 cm, dia, height 4 cm indigenous	126	Quarts 5 cm dia, height 4 cm
127	Gooch porcelain or glass	127	Material: Porcelain Ceramic; Capacity: 13mL, Top Diameter: 29mm, Bottom Diameter: 18mm, Perforated Diameter: 0.7mm, Filter Paper Diameter: 15-16mmGooch crucible has a perforated bottom and is white glazed inside and out, except for the outside bottom surface and rimGooch crucibles are ideal for total suspended solids determinationMaximum temperature limit for use: 1150°C
128	Filtering 0, 1, 2, 3 glass	128	.25 mm / 9.84 mils
129	Test tube (160 mm x 15 mm.)	129	Neutral hard glass, heat resistant (Autoclaveable);Furnace annealed (made in automatic plant)15 mm x 160 mm
130	Test tube (10 mm.)	130	Neutral hard glass, heat resistant (Autoclaveable);Furnace annealed (made in automatic plant) 10 mm x 75 mm
131	Gas sampling tubes .	131	Gas sampling tubes with two three way double oblique bore stopcocks one on each side 250 ml capacity
132	Paiers nessler tubes	132	Nessler tube for colour comparison class A with work certificate100 ml capacity with subdiv 50&100 and tolerance+ ₋ 0.8 ml
133	Tubes for centrifuge	133	Conical Bottom Graduated MOC – Borosilicate Glass Capacity Approx. OD * Length 15 ml 17 * 120 mm Conical Bottom Graduated MOC – Borosilicate Glass Capacity Approx. OD * Length 15 ml 17 * 120 mm
134	Tubes for Gerber centrifuge	134	Round bottom graduated centrifuge tube 100 ml capacity 45*110 mm
135	Bottles with droppers for indicator solutions & semi-micro qualitativeanalysis 30 ml.	135	Dropping bottles fitted with ground in interchageable stopper and rubber teat 30ml capacity
136	Bottles with droppers for indicator solutions & semi-micro qualitativeanalysis 50 ml	136	Dropping bottles fitted with ground in interchageable stopper and rubber teat 50ml capacity
137	Bottles for solids 50 ml.	137	Bottle wide mouth with polypropylene blue screw cap and pouring ring, repeatedly autoclaveable, moulded amber coloured capacity 50 ml. Plastic
138	Bottles for solids 100 ml. .	138	Bottle wide mouth with polypropylene blue screw cap and pouring ring, repeatedly autoclaveable, moulded amber coloured capacity 100 ml.
139	Bottles for solutions 100 ml.	139	Wide mouth with interchangeable hollow stopper 100 ml
140	Bottles for solutions 250 ml.	140	Wide mouth with interchangeable hollow stopper 250 ml
141	Bottles for solutions 1000 ml.	141	Wide mouth with interchangeable hollow stopper 1000 ml
142	Bottles for solutions 2000 ml.	142	Wide mouth with interchangeable hollow stopper 2000 ml

143	. Bottles for solutions 3000 ml.	143	Narrow mouth with interchangeable hexagonal flat head hollow stopper 3000 ml
144	Bottles for solutions 5000 ml.	144	Narrow mouth with interchangeable hexagonal flat head hollow stopper 5000 ml
145	One pan analytical balances (Mettler type) – if available indigenously 0.1 mg.sensibility	145	The balance case, of formed aluminum sheets with glass doors, is 16 1/2" high, 9 1/2" wide and 20" deep. The balance has a capacity 160 g., a range of 1,000 mg on the optical scale, an accuracy of ± 0.1 mg, and weights adjusted to within Class S tolerances
146	. LCD Multimedia projector	146	Projection System Epson Original LCD Prism technology Projection Metho Front/rear/ceiling mount Size: 1.0 inches, Driving Method: EPSON Poly-Silicon TFT Active Matrix, Pixel Number: 786,432 dots X 3 (1024 x 768) LCDs, Native Resolution : XGA, Aspect Ratio: 4:3 (supports 16:9, 5:4), Pixel Arrangement: Stripe Projection Le Type: Manual: Zoom/Focus, F-number: 1.7 - 2.3, f-number 28 - 37mm, Zoom ratio: 1.0-1.35 Lam 250W UHE, 2000H (High Brightness) Screen Width Ratio: (Dist/Width 1.32 to 1.8:1 Screen Size: (Projected Distance 30" to 300": (0.8m to 11.m) Lens Shift N/A Keystone Correction Vertical: +/- 40°, Horizontal: +/-20°, Auto Keystone Correction (Vertical only) Brightness: (typical) 3500 ANSI lumens, 2500 ANSI lumens (Low Brightness)
147	. Computer/Laptop (latest configuration) with licentiate operating software.	147	Pentium IV Computer or latest (Client- windows XP or higher) 2.8 GHz, 512 MBRAM, 40/80 GB HDD, DVD Combo Drive, 15"/17" Monitor, optical scroll mouse, multimedia key board, LAN card, necessary Drivers & Antivirus software
148	Printer (Printer, Scanner & Copier) .	148	LQ 1150, Auto Scan Mode, Voltage:- 230v, 50/60 Hz, Warm-Up Time: From Power Off – 4.5 seconds Max. From Enery Saver Mode – 1 second Max. Resolution: Copying: 600 x 600dpi + RST (1200 x 600dpi), Printing: 2400 x 600dpi (AIR), Printing: 2400 x 600dpi (AIR) Multiple Copies/Prints : 1-99 sheets, Power Requirements Supply: 230V/50Hz -60Hz, Consumption: 230V/1.9A Max 890W or less

149	Microscope x 1000 (Monocular)	149	"Head: 45°Inclined 360°rotatable monocular Eyepieces: wide field WF10X and WF25 Objective: 4x/10x/40x Total magnification: 40x, 100x, 250x, 400x and 1000x Built-in tungsten light 110v/20w Disc diaphragm at size 2, 3, 4, 5, 7, 8mm Focusing movement stroke: 8mm Power: 110v/60Hz Dimension: 6-1/2 "" x 4-1/2"" x 12"" (16.5cm x 11.5cm x 30.5cm) Net weight: 2 lb 13 oz (1.3kg)
150	Microscope metallurgical	150	"Trinocular Observation Head Siedentopf observation head inclined at 45o . Diopter adjustment ring on ocular tube. Analyzer rotatable at 360° . Polarizing & analyzer can be slide in/out of the optical path. Interpupillary distance from 40mm to 75mm. Inner locating ball bearing nosepiece. Observation on trinocular head,compensation(inclined 30degrees) Triple plate for X and Y movement of workstage. Anti-fungal coated objectives. Mechanical Stage is 108mm x 155mm,. The mechanical stage has low positioned co-axial controls on ball bearing guide ways. The Epi Illuminator has 3W LED lamp adjustable brightness. Wide field eyepiece 10X (Paired) FOV 20mm Objectives (Infinity Corrected) M - Long Working Distance Plan Achromatic 5 X WD M - Long Working Distance Plan Achromatic 10 X WD M - Long Working Distance Plan Achromatic 20 X WD M - Long Working Distance Plan Achromatic 50 X (S L)"
151	Polariometers	151	Measuring Range -180 ~ +180 Scale Value 1 Vernier 0.05 Magnifier 3x Light Source Sodium Lamp Wavelength 589.44nm Round Cuvettes 100 or 200mm Power Requirements AC 220V/50Hz Dimensions 500(L)135(W)330(H)mm
152	Refractometers (Abbe type with refractive index).	152	measure with up to 5x10-5 limit of error and temperature range up to 100°C
153	pH meters	153	pH Range : 0 – 14 pH Millivolt Range : 0 - + 1999 mV Standardization Range : + 2 pH approx. Temp. Compensation : 0 to 100 oC (manual) Display : 4 – digit LED with automatic polarity & decimal point, mode annunciation by LED lamps Slope Correction : 80 % to 105 % Repeatability : + 0.01 % pH + 1 digit; + 1 mV + 1 digit Resolution : 0.01 pH; 1 mV Polarizing Current : 10 microampere Power : 230 V + 10 % , 50 Hz. Accessories : A pair of electrodes or combined (glass and calomel) with stand and manual.
154	Potentiometer titration apparatus	154	A 10ml graduated burette, two electrodes : an indicator electrode (the glass electrode and metal ion indicator electrode) and a reference electrode. Reference electrodes : The hydrogen electrode,the calomel electrode and the silver silver chloride electrode].

155	Conduct meter .	155	"1. Level: Level 0.5 , Measuring range: Conductivity: (0~1.999×105)μS/cm, six steps of measuring range, automatic switchover can be done. (0~1.999)μS/cm (2.00~19.99)μS/cm (20.0~199.9)μS/cm(200~1999)μS/cm (2.0~19.99)mS/cm (20.0~199.9)mS/cm TDS : (0~19990)mg/L , five steps of measuring range, automatic switchover can be done. (0~10.00)mg/L (10.0~100.0)mg/L (100~1000)mg/L (1.0~10.00)g/L (10.0~19.90)g/L Salinity: (0.0~80.0)ppt,Temperature: (-5.0~105.0)°C 3. Electrode constant, cm-1:0.01, 0.1, 1.0, 10.0 4. Basic error of electronic unit Conductivity: ±0.5%(FS)±1 Salinity: ±1.0ppt,Temperature: ±0.3°C±1 5. Stability of electronic unit: ±0.03(FS)±1 /3h 6. Basic error of the instrument: ±0.75(FS)±1 7. Temperature compensation range: :(0~50.0)°C, datum degree of conductivity: 25°C, datum degree of salinity: 18°C 8. External dimension: 290×200×75mm 9. Weight of the instrument: 1kg 10. Supply current: AC 220±22V, frequency: 50±1Hz"
156	Viscometer (Redwood, Brookefield) .	156	40-86 deg centigrade temperature & Maximum flow rate 20-200 seconds
157	Orsat's Apparatus	157	Orsat apparatus with three absorption pipettes of two compartment type,100 ml gas burette with outer jacket, manifold with stopcocks, and aspirator bottle, for the analysis of Carbon monoxide, carbon dioxide, oxygen paticularly in fuel and furnace gases, complete in wooden cabinet with sliding door
158	Apparatus for surface tension	158	250mm borosilicate glass capillary tube Engraved graduations Graduated from 0 to 10cm, in 1mm divisions Cork holds capillary tube inside outer tube Outer tube accommodates rubber tubing
159	Chromatographic equipment (paper, column, thin layer)(if available indigenously)	159	All PAL HPLC sample loaders can be equipped with injection valves built for pressures up to 15,000psi (1000 bar). 6 - or 10-port design available. Various bore sizes for nano- and micro applications,*Three flow ranges can be covered with this one high performance LC pump.Two XYZs and two syringes or other tools enable a Twin PAL to be a extremely versatile robotic sampling and liquid handling device.
160	Fisher apparatus for moisture determination, if available indigenously	160	250ml Reaction Vessel, Dual Platinum Electrode, Teflon Paddle Teflon Assembly , Moisture Trap for Reaction Vessel & 250ml Amber Reservoir Bottle, Dispensing Tube (02 Nos), Teflon Tubing for Dispensing Path, Operational & Instruction Manual.

161	Gas chromatography instrument with computer & printer	161	PerforRange: 0-1000 ppm to 100% for individual components Components 16 maximum Streams: 8 plus + 1 calibration Response: 4 minutes for C1 to C6+, N2, CO2 5 minutes for C1 to C7+, N2, CO2 3 minutes for H2S and CO2, depending on background composition For other measurements / times please consult factory Linearity: 1% for individual components Repeatability: ±0.5 BTU per 1000 BTU Operation Parameters Ambient temp.: -10°C to 55°C (Optional enclosure: -40°C to 60°C) Humidity:
162	High performance liquid chromatography instrument with computer & printer	162	4 Valve Option for automated parallel LC-MS analysis, *All PAL HPLC sample loaders can be equipped with injection valves built for pressures up to 15,000psi (1000 bar). 6 - or 10-port design available, *Various bore sizes for nano- and micro applications Three flow ranges can be covered with this one high performance LC pump. Two XYZs and two syringes or other tools enable a Twin PAL to be a extremely versatile robotic sampling and liquid handling device.
163	Apparatus for determination of flash point	163	Abel Flash Point Apparatus is suitable for determining the close cup flash point of Petroleum and mixtures. It is suitable for oils whose flashes below 70°C. supplied with oil cup, cover fitted with stirrer, thermometer socket S.S. Water...
164	Melting point apparatus	164	temperature upto 35 deg c with three capillary holes and magnifying lens & energy regulator
165	Electrolytic analyser	165	Sample Size : 150µL, Analysis Time: 49 Seconds, Ambient Condition; 15 deg to 40 deg, Power: 100 ~ 120 V, 50 ~ 60 Hz, 0.6 A, 200 ~ 240 V, 50 ~ 60 Hz, 0.35 A, Dimension & Weight: 270 mm W x 260 mm D x 410 mm H, 12 Kg with reagent pack
166	Photocolorimeter	166	Range 400 nm to 700 nm Filters Standard glass Filters Min. Volume 1 ml. Accuracy - 0.02 O.D. Reproducibility - 0.01 O.D. Output Optical Density 0 to 1.99 Display 2% Digit LED Display Detector Selenium Photo Cell Light Source 6.2 V 0.3 Amp. Tungston Filament Lamp Power 230 v - 10% 50 Hz Ac Size (LxBxH) 305x305x165mm

167	Uv visible spectrophotometer	167	"Spectral bandwidth 1nm (190 to 1100nm) Wavelength display 0.1-nm increments Wavelength setting 0.1-nm increments (1-nm increments when setting scanning range) Wavelength accuracy ± 0.1nm at 656.1nm D2 ± 0.3nm (190 to 1100nm) Wavelength repeatability ± 0.1nm Stray light less than 0.02% NaI at 220nm, NaNO₂ at 340nm less than 1.0% KC1 at 198nm, Photometric system Double Beam Photometric range Absorbance: -4 to 4 Abs Transmittance: 0% to 400% Photometric accuracy ± 0.002 Abs (0.5Abs) ± 0.004 Abs (1.0Abs) ± 0.006 Abs (2.0Abs) Photometric repeatability less than ± 0.001 Abs (0.5Abs) less than ± 0.001 Abs (1Abs) less than ± 0.003 Abs (2.0Abs) Baseline stability less than 0.0003 Abs/H at 700nm (one hour after light source turned ON) Baseline flatness within ± 0.0006 Abs (190 to 1100nm, one hour after light source turned ON) Noise level Within 0.00005 Abs RMS value (at 700nm) Dimensions (WxDxH) 450(W) x 490(D) x 270(H) Weight 15kg Printers DPU, ESC/P, PCL printers, USB I/F Windows-compliant printers are available with USB memory and PC software Memory USB memory (option) Saved as text and UVPC file Performance for PC USB memory+ UVProbe (standard) Win XP"
168	Flame photometer .	168	"Range Na: 0.1-100 ppm Upto 250 meq/l, 1:100 dil K: 0.1-100 ppm Upto 250 meq/l, 1:100 dil Ca: 15-100 ppm Upto 250 meq/l, 1:100 dil Li: 0.5-100 ppm Upto 250 meq/l, 1:100 dil Na: 0-200, 1:100 dil K: 0-10, 1:100 dil Ca: - Li: 0-2, 1:5 dil Na: 0-250, 1:100 dil K: 0-100, 1:100 dil Ca: - Li: 0-10, 1:2 dil Sensitivity General Mode: Na:0.5 ppm, K:0.5 ppm, Li:0.5 ppm, Ca:15 ppm Filters Na & K Supplied (Ca & Li are optional at extra cost) Resolution 0.1 ppm/meq Reproducibility + 2% FS, & ± 2 Digits Curve Fit Accuracy + 2% FS Display 20 x 4 Alphanumeric backlit LCD display Average Time In-built in Software Flame System LPG & dry oil free air Detector Silicon Photodiode Calibration Upto 5-Point Calibration with curve fitting software
169	Bourdon Tube Pressure Gauges Different Ranges	169	Dial Size : 150 mm Range : 0 – 3.5 kg/ cm² 0 - 7 kg/ cm² 0 - 10 kg/ cm² 0 - 30 kg/ cm² Accuracy : ± 1 % Bourdon Socket : SS 316 Movement Case : SS 304 Mounting : 1/2" / 3/8" BSP (M), Bottom
170	Compound Gauge .	170	Gauge Type Field Liquid Fillable Dial Size 2-1/2" Range 30" Hg Vac to 30 psi Connection Size 1/4" NPT Connection Location Lower Smallest Graduation 0.5 psi Accuracy $\pm 1-2$ %
171	Diaphragm Type Pressure Gauge	171	Ranges -25 ... 0 mbar up to 0 ... 25 bar-10 ... 0 in. H₂O up to 0 ... 300 psi

172	Dead Weight Tester with Assoceries	172	Dead weight tester up to 20 Kg / Sq.Cm With All Accessories It should consist of frictionless piston (ram) mounted on a rugged base. Effortless screw type operating system. Rotation of the screw should produce the pressure which is to be balanced by precision weights. Range : 0.5 – 30 kg/ cm² Step Size : 0.1 kg/ cm² Accuracy : 0.2 to 0.1 % Standard Accessories: • Accurately Calibrated Weights to cover the entire range with a carrying case • Gauge connection adapters for 1/8", ¼", 3/8", ½" BSPF; ½" NPTF, 20 * 1.5 mm on ½" BSPF Fitment, Pointer Puller and Pointer Punch, Gauge Opener, Spirit Level, A set of spanners in a tool box, 500 ml SAE 30/ 40 Oil in bottle • One set of spare seals and O ring
173	Comparator with Assoceries & STD Pressure Gauges	173	"Accuracy: ±0.25% Pressure Ranges: 0 to 10,000 psi Operating Fluids: 1327D - SAE 20 automotive or machine oil 1327DH - Phosphate ester or Glycol based hydraulic fluids 1327DO - Distilled water (with sodium molybdate and phosphoric acid additives recommended as corrosion inhibitors)"
174	Thermocouple Type K, J,I,T	174	"Input Voltage :230V AC Input Frequency : 50Hz Output Voltage :5v/500MA -5v/500MA +12V/500MA -12/500MA"
175	Digital Millivoltmeter	175	Display : 3 ½ LCD with maximum display 1999. Polarity : Auto polarization Over range : maximum display "1"
176	Mercury in Glass Thermometer	176	Mercury in glass engraved on stem, accuracy ±1 Range :0 – 50 deg C 0 - 110 deg C, 0 – 150 degC Least Count :1 deg C Length :300
177	Alcohol in Glass Thermometer .	177	low temperature Alcohol filled 30 cms long accuracy± 1 division range -30°C to + 30°C, or about -50°C to 100°C
178	Filled System Temperature Indicator	178	Range : -1 TO 30 bar Resolution : 10 mbar Over pressure : 60 barSupply : 3 volt battery Unit : selectable bar,kpa,mpa,psi,kg/cm Reset : with reset function Protection : IP65
179	Bimetallic Thermometer	179	Dial Size : 100 mm Range : 0 – 100Deg. C Accuracy : ± 3 % of range,30 cm stem length,stem at back made of brass Stem Dia. : 9 mm Immersion Length : 250 mm Connection : ½" BSP (M), Mounting : Vertical

180	Resistance Thermometer (Pt-100)	180	Resistance Bulb Thermometer : Pt - 100 Accuracy : Class A Insulation : Mineral insulated Terminal Block : 4 wire termination in ceramic terminal block provided in cast Aluminium Block Length : 200 mm The construction drawing, Temperature Vs Resistance Table & calibration Checking procedure along with portable wheatstone bridge (having inbuilt Galvanometer & battery) to measure resistance of Resistance Bulb Thermometer having measurement accuracy + 0.075 %.
181	Heating plate (electric) 1000 watt	181	Mounted on thick MS sheet body at smooth surface cast iron top, heated with an electric element of oidise kanthal wire.laid under the plate. Athree stem rotary switch works on 220/230AC controls heating. The top is finished with heat resistant black and the body is finished with white blue stoving ,rectangular hot plate fitted with three heat rotary switch size (L * B * H) = 12*10*6" 1000 watt,220/230 Volts
182	Thermostatic bath	182	Stainless Steel Boiling bath 4.54 Litres (Approx) 321 x 219 x 90mm - 6 x 80mm Holes
183	T.C. Pyrometer	183	"Four digits, 0.8"" (20 mm) large LCD display. Display in either °C or °F. Input sensor type: K type thermocouple Display range: For 1 degree resolution: -145-1310 °C, -229-2390 °F. For 0.1 degree resolution: -145.0 to 599.9 °C, -199.9 to 999.9 °F Over range display: Hi or Lo. Sampling rate: 16 times/second Storage condition: 0-50°C (32-122°F), <80%RH. Battery type: 9V. Battery Life: 300 hr for alkaline battery. 150hr for heavy duty battery. Size: 5x2.5x1"" (130cx65x23 mm). Weight: 125g (including battery). Accuracy: +/- 0.2% reading ±1°C/°F"

184	Digital Multimeter .	184	Multi meter Digital 3 ½ Digit Display : 3 ½ LCD with maximum display 1999. Polarity : Auto polarization Over range : maximum display “1” Working Environment : Temperature : 0 – 40 oC Relative Humidity : < 75 % Storing Envr. : - 15 ~ 50 oC Battery : 9 V zinc NEDA 1604 or 6F22 or 006P High voltage symbol : DC 1000V or AC 750 V range should show high voltage symbol “HV” Low Voltage Indication : BAT symbol Accuracy : a% reading NO. of digits Jack : Common, Voltage, Resistance, not more than 200mA Current And Batteryinput test, 50 Hz square wave output. DC Voltage Range : 200 mV, 2 V, 20 V, 200 V, 1000 V DC Current Range : 200 µA, 2000 µA, 20 mA, 200 mA, 10 A. AC Voltage Range : 200 V, 750 V,
185	Pressure regulating Valve	185	Fluid Application : Air Size : ¼” Input Pressure : 0-10 kg/ cm2 Output Pressure : 0 - 7.0 kg/ cm2 Filter : 25 micron Input Pressure Gauge : 0-10 kg/ cm2 bourden tube type Output Pressure Gauge: 0-7 kg/ cm2 bourden tube type
186	Quantity meters, Orifice meter ,Rotameter	186	Orifice Meter Without Test Rig Size : Suitable for 1” GI pipeline Dia. Ratio : 0.6-0.64 MOC : SS (Rust Proof and Nonmagnetic) Venturimeter Without Test Rig Size : Suitable for 1” GI pipeline Dia. Ratio : 0.6-0.64 MOC : Brass With suitable Pressure tapplings Rota meter Without Test Rig Range : 1 - 10 LPM MOC : Borosilicate Glass Tube Housed in MS Box And two perspex side Float : SS Valve : Integral Type
187	Circular chart Recorder	187	Type : Electronic Circular Chart Recorder: Input : 4 – 20 mA Display Range : 0 – 100% Resolution : 0.1% Accuracy : + 1.0 % Recording :Steeper Motor Controlled 0.5% resolution & repeatability Pen : Ball Point of Red Color Power : 180 - 260 V AC, 50 Hz Power Consumption : 10 VA max. Chart Speed : Rotation per Shift (8 hrs.) No. of Charts : 30 pics.

188	PH meter	188	pH Range : 0 – 14 pH Millivolt Range : 0 - + 1999 mV Standardization Range : + 2 pH approx. Temp. Compensation : 0 to 100 oC (manual) Display : 4 – digit LED with automatic polarity & decimal point, mode annunciation by LED lamps Slope Correction : 80 % to 105 % Repeatability : + 0.01 % pH + 1 digit; + 1 mV + 1 digit Resolution : 0.01 pH; 1 mV Polarizing Current : 10 microampere Power : 230 V + 10 % , 50 Hz. Accessories : A pair of electrodes or combined (glass and calomel) with stand and manual.
189	Diaphragm control valve, Air to open .	189	Dia 4” / 100 mm stainless steel for flange Design
190	Diaphragm control valve, Air to Close	190	Dia 4” / 100 mm stainless steel for flange Design
191	Capacitance Type Level Transmitter	191	Application : Solid (Fine Sand Powder) Type : Radio Frequency Probe : Fully Insulated suitable rod probe with Preamplifier mounted on Probe head generates RF Signal and converts detected Capacitance Signal to Current signal. Measuring Range : 10 to 300 mm Housing : Cast Aluminum, IP 65 Mounting : Control panel Output : 4 - 20 mA current in Corresponding to Level. Accuracy : Better than $\pm 3\%$ of full scale reading Supply Voltage : 230 V AC ($\pm 10\%$), 50 Hz Indication : 0 – 100 % linear (2 ½ digital display) Sump TankCapacity : 50 literMOC :SS-304 With ½” drain valve of SS. Measurement Tank: Size : 200 (D) * 500 (H) mm MOC : Acrylic With 1”/ ½” drain valve and piping leading the water to the sump tank.
192	Pressure Transmitter	192	Principle : Piezo Resistive Measurement Range : 0 - 5 bar Output : 4-20 mA, 2 wire Power Supply : 24 V DC Process Connection : ½” or ¼” BSP(M) □
193	On off Controller	193	"Applicable sensors Photoelectric sensor, inductive proximity sensor, etc., with NPN transistor output or relay output Supply voltage 100 to 240 V AC $\pm 10\%$ Power consumption 6 VA or less Power supply for sensor Voltage 12 V DC $\pm 10\%$ (incorporated with short-circuit protection) Current 150 mA max. 130 mA max. 120 mA max."
194	Physical balance (with weight box)	194	Cap-0-250g, accuracy -0.001g
195	Chemical balance (with weight box)	195	Beam : Brass beam with 100 notches graduated for rider use with zero at center Arrestment : Six-point arrestment. The beam is raised for working Rider : Single wire, easy operating arrangement Knives and Planes : Best quality agate Pan : Stainless steel concave inwards Pan Diameter : 7. 5 cm Capacity : 200 gmm Sensitivity : 0. 2 mg

196	Viscometer :	196	
197	(a) Oswald viscometer	197	Viscometer with constant @ 40 deg C , @ 50 deg C , @ 100 deg C
198	(b) Redwood viscometer	198	Temperature range Ambient to 250°C (482°F) Temperature Stability ± 0.03 up to 150°C (302°F) ± 0.1 above 150°C (302°F) Capacity 14 litres Bath Fluid Oil Capacity 14 litres Voltage 110/120V, 50/60Hz 220/240V, 50/60Hz Power 101kW Size (HxWxD) 79 x 49 x 31cm
199	(c) Stop watch (1/10th Secn)	199	1/10th Seconds
200	(d) Thermostatic bath	200	Stainless Steel Boiling bath 4.54 Litres (Approx) 321 x 219 x 90mm - 6 x 80mm Holes
201	Talagrometer	201	The device is based on a capillary glass tube whose middle section is widened. In terms of the volume of the drop, it could be calibrated to the same size based on the design of the stalagmometer. The part of the bottom of the device is narrowed down to let the fluid fall out from the tube in a shape of drop.[2][3] In the experiments, the drops of the specific fluid are flowing slowly from the tube in a vertical direction
202	Travelling microscope .	202	Microscope tube is fitted with 10x Ramsden Eye Piece with cross line graticule & an Achromatic 2"or 3" focal length objective of high quality. Travels 17 cms horizontally and 14 cms vertically. Guaranteed accurate vernier reading 0.02 or 0.01 m
203	Specific gravity bottle	203	2 ml to 200 ml capacity interchangeable capillary bore teflon stopper, class A with work certificate.
204	Pyknometer	204	Capacity 11.5 mL Dimensions 1"H x 2" dia (2.5 cm H x 5.1 cm dia)
205	Mechanical board for testing triangle and parallelogram of forces including all accessories	205	The apparatus for measuring and testing of triangle & parallelogram of forces should have a wooden board made of wood and fixed within a wooden slotted frame of over all size 75 cm * 70 cm .Four (two set) frictionless pulleys of 4 to 5 cm diameter are adjustable in the slots of the frame with clamp and frame is provided with suitable arrangement for fixing it to a wall. i.e hanging type or it should have self supported stand. The unit is complete with four weighting hangers and iron nickel ed slotted weights of 50 gm each with weighting pan of two SS set of 5 * 5 gm,5*10 gm,5*20 gm .A weight box of 500 gm also includes scope of supply.

206	Spirit level	206	Made from stress relieved Cast Iron, working faces precision hand-scraped. Main vials have graduation on each side of the bubbles Auxiliary vial shows lateral position and assists in horizontal setting Fool proof adjustment to avoid tempering, once set. Sensitivity 0.01 mm/m, 0.02 mm/m, 0.05 mm/m & 0.1 mm/m in 200 mm and 300 mm length. In precision frame type spirit level, Base & one vertical face are provided with prismatic face for checking cylindrical surfaces, while other two faces are flat to check flat surfaces. Sensitivity 0.01 mm/m, 0.02 mm/m, 0.05 mm/m & 0.1 mm/m in size 200 x 200 mm and 300 x 300 mm. Remaining features as horizontal Levels. Magnetic Levels and Shaft Spirit Levels also offered. Special sizes offered on request. Provided with wooden storing case.
207	Inclined plane with pulley, pan, weight etc.	207	Speed : 1.5° to 2.0° / second. Weight of the sled: 750 grams. Size of sled : 4 inch X 2 inch. Accessories : 2 nos. of S.S templates. Paint : Powder coated. Power : 230 Volts, 50Hz, single phase
208	Simple machines (Wheel and axle), screw jack inclined plane with roller or trolley, pulleys or pulley blocks for first, second and third system of pulleys).	208	Screw Jack :- All metallic constructions and a accurately machine cut screw with a pitch of 5 mm crying a double flanged turn table of about 20 cm dia fitted on a heavy cast iron base and complete with two adjustable pulleys cord & hooks without wts. b) Screw Jack :- Small size, experimental demonstration type model with an aluminium turned pulley of about 10 cm dia is fitted on a screw jack which is fitted on a 12cm dia metallic circular base with an adjustable pulley and a linear vertical scale, over all height is about 15 cms with out wts.
209	Different types of levers	209	first, second and third system of pulleys
210	Instrument for determining 'g' (simple pendulum).	210	The instrument should consist of a brass ball of 1" dia . With hook. the suitable stand for the experimentation should also to be supplied with the unit . necessary accessories are to be included in the scope of supply.
211	Barometer	211	The instrument should be recommended in a laboratory for routine observations of high accuracy. Heavy walled corning glass tube and cisterns should be supported and protected by metal casing. Each mercury level should be sufficiently exposed to receive proper illumination. The Vernier should be actuated by rack and pinion and vernier constants are 0.002 in cm and 0.05 mm, a glass sheath should be used to protect silvered brass scale. The metal parts of the barometer should have a durable attractive finish in chroms and black duco finish. Full-length single brass tube should be used in it. It should be mounted on a well-polished wooden board. Mercury is excluded from the scope of supply.

212	Altimeter	212	typical Weight: 13 ounces Number of Pointers: 3 Barometric Setting: 28.1 to 31.0 in Hg/946 to 1050 mb Calibrated Ranges: -1,000 to 20,000 or +35,000 feet Static Pressure Connection: 9/16-18 UNJF-3B Installation: Removable spring nuts and screws ypical Weight: 13 ounces Number of Pointers: 3 Barometric Setting: 28.1 to 31.0 in Hg/946 to 1050 mb Calibrated Ranges: -1,000 to 20,000 or +35,000 feet Static Pressure Connection: 9/16-18 UNJF-3B Installation: Removable spring nuts and screws
213	Searle's apparatus for young's, modules, modules	213	Searle's apparatus for young's modulus: It should be comprise of two metal frames connected by a link. The frame should be fitted with self centring chuck. An accurate cut micrometer screw to read 0.01 mm should be fitted in one frame; one end of sensitive spirit level should be pivoted on the frame. the other end should rests on the point of a micrometer screw fitted in the other frame. The instrument is to be covered in good quality wooden case. a set of iron slotted weights (500 gm each) and one hanger of same weight will supplied , accurately adjustable.
214	Nicholson's Hydrometer with glass jag	214	It should work on the principal of constant volume. It is a common form of the constant volume immersion type of the hydrometer. That Is every time the portion of the hydrometer immersed in the liquid has a constant volume. It should consist of a glass jar with a pan, a stem, a float (hollow cylinder) with loaded pan at the base by lead shots.
215	Wet and dry bulb thermometer	215	Measuring Range: -35°C to +55°C Accuracy: $\pm 0.1^{\circ}\text{C}$.
216	Apparatus for measurement specific heat of solid and liquid (Renault'sApparatus).	216	Renault'sApparatus
217	Apparatus for measurement of coefficient of expansion (thermal) of solid and liquid	217	It should consists of a half-meter long chromium plated rod, surrounded by a brass tube with an inlet and outlet for steam. Steam prepared in copper steam boiler of 1-liter capacity enters the tube through the inlet and leaves it through the outlet. The rod should rest with its lower end on a glass plate kept at the base of instrument and the other end is free to expand upwards. It reaches up to a hole in a glass or an ebonite plate. The latter rests on a wooden platform of the outer casing. A spherometer rests on this platform such that its central screw just touches the rod. A thermometer (excluded from scope of supply) is inserted from a side tube by which the temperature of the rod can be measured. Complete setup includes two different metal rods.

218	Apparatus for measurement of thermal conductivity of good and bad conductor	218	Searle's thermal conductivity apparatus: it consist of a copper rod 30 x 2. 5 cms dia with its one end surrounded with a steam jacket for heating it from a boiler and the other end is kept cool by a steam of water flowing throughout a spiral tube fitted on that end fitted in a well polished teak wood case w/o thermometer and boiler. b)Searle's thermal conductivity apparatus: as above but 'inco' pattern. c) Searle's thermal conductivity apparatus: as above but 3. 75 cm dia of copper rod. d) Searle's thermal conductivity apparatus: same as above, bat inco pattern type.
219	Calorimeter for determining mechanical equivalent of heat and specific heat.	219	operates on 0 to 6 V DC. The unit consists of an aluminum outer can, a 1.7 cm thick styrofoam lining, plastic insulator ring and aluminum heat reservoir designed to control heat loss. The lid accepts heating element, stirrer and thermometer. Cover cap included.
220	Thermometers	220	
	(i) 0 to 110 C		0 to 110 C mercury in glass
	(ii) 0 to 210 C		0 to 210 C mercury in glass
	(iii) 0 to 300 C		0 to 300 C mercury in glass
221	Polarimeter with monochromatic light	221	Rotating polarimeter 360° with 180° left and 180° right rotation Double vernier scale: accuracy 0.05 Monochromatic light source of 589 nm Mains power: 220-240V/50-60Hz, on/off switch Reactor for Sodium bulb Bulb: sodium - 20Watt Supplied with: 2 spare fuses, 2 test tubes (100 and 200 mm), screwdriver and instruction manual Packing: two styrofoam shelves in a cardboard box Packing dimensions: 60x20x40cm (WxDxH). Gross weight: 8,0kg
222	Abbe refractometer	222	Measurement range 1.3000–1.7200 nD 0–95 %Brix Accuracy ± 0.0002 nD ± 0.1 %Brix Resolution 0.0001nD 0.1 %Brix Temperature Range 0–99 °C Temperature resolution 0.1 °C Autom. Temperature compensation 0–90 °C Interfaces serial RS-232 9600 Baud serial RS-422 9600 Baud Power supply 110/230 V, 50/60 Hz, 40 W Dimensions in cm 12.0 x 29.0 x 25.0 Weight 5 kg

223	Pulfrich refractometer	223	The instrument stands 15 7/8" high in the closed position without a thermometer. The inlaid 'silver' divided circle is 5" in outer diameter, set in a 5 1/4" diameter brass circle with knurled edge. The tripod base is of heavy cast iron, with a japanned finish. The rest of the instrument is brass,, except for the telescope, which is of aluminum, and lower heat exchange finger/thermometer holder which is copper..
224	Equipment to study Kirchhoff's law and Electrochemical equivalent	224	verify KVL and KCL. Unit consists of built in regulated power supply (1.2-10V at 100mA), two meter & set of resistance with circuit diagram printed on front panel. with two digital meters.
225	Potentiometer	225	It should consists of portable potentiometer for calibrating thermocouple type Pyrometer with in-built battery (dry cell) and galvanometer with resolution of 10 μ V. A mercury filled glass thermometer for measuring room temperature for reference junction compensation to be supplied with the unit. It should also consists of Programmable Digital Indicator (Pyrometer), having Front Size 96 * 96 mm with + 0.5 % Accuracy. It should have facility to select mV range & thermocouple type (J, K, E & N) ranges, oC/ oF Unit, with in – built automatic reference junction compensation (for thermocouple inputs). The unit should supplied with instruction manual for Portable Potentiometer, Digital Indicator
226	Whetstone's bridge	226	Range : 0.001 ohm to 11, 11 megohms. Series Arm : Four decades in steps of thousands, tens and units ohms using manganium coil which can be used as a series resistance box also with + 0.1% accuracy Ratio Arms : The ratio arm of bridge are to be capable of selecting multiplying factors of 0.001, 0.01, 1, 10, 100 and 1000 for conductive resistance measurements and for varley loop test Null Detector Galvanometer : Ri 20 ohms, 1mm/ μ A sensitivity Battery : 3 cell of 1.5 V, R 20 size

227	Resistances Centre zero galvanometer .	227	The instrument should consists of a taut suspension movement, light source, projection system, scale and sensitivity control switch. All components of the instrument should be housed in a dust free aluminum cabinet nicely finished by stoving enamel paint. The light source consisting of a 4V, 4W lamp is to be mounted on a small rectangular detachable plate fixed in the front of the galvanometer housing to allow the bulb to be replaced. A circular plate should be fixed on this rectangular plate that enables the exact adjustment of light spot. 4 V supply for the lamp can be obtained either through 220 – 240 v AC mains or through external 4V battery. The galvanometer indicator should consists of a bright circular spot of light with a vertical hair line shadow on a translucent scale with dual graduation in millimeters (0- 14 & 7-0-7 cms) the instrument should consist of a built in universal shunt, which adjusts the galvanometer sensitivity in convenient steps by means of a switch. The galvanometer should be supplied with two banana plugs with one meter for connecting the 4 V battery, 1 ½ meter long mains cable with plug and one shorting link for shorting the battery terminals when using mains. Resistance of coil : 20 ohms Period : 2 seconds Critical damping resi : 140 ohms Terminal resistance : 17.5 Sensitivity : 7 mm / micro A and 0.35 mm / micro V Overall size : 280 *185*140 mm (Approx.)
228	Resistance box	228	
	(a) Resistance box 0 to 100 ohms		0-100 ohms It should be manganin resistance coil with non inductively wound and aged resister having low temperature coefficient. Also it should have a very low contact resistance switch. Accuracy : at 27 degree +/- 0.05 % Effect of Temperature % per 10 degree : 0.01and 0.1 ohms – 0.1 1 to 10 k ohms 0.02 100 K and 1 M ohms – 0.10 Current Carry Capacity : Max. Value IMAX 0.07 Amp Residual Resistance : 0.002 ohm per dial, all dials set at zero. High Voltage Test : 2 KV between terminal and instrument case. Ambient : 15-45 degree C , RH 75 % average, 90 % maximum Resistance Box : 0 to 100 ohms □

	(b) Resistance box 0 to 500 ohms.		0-500 ohms It should be manganin resistance coil with non inductively wound and aged resistor having low temperature coefficient. Also it should have a very low contact resistance switch. Accuracy : at 27 degree +/- 0.05 % Effect of Temperature % per 10 degree :0.01and 0.1 ohms – 0.1 1 to 10 k ohms 0.02 100 K and 1 M ohms – 0.10 Current Carry Capacity : Max. Value IMAX 0.07 Amp Residual Resistance : 0.002 ohm per dial, all dials set at zero. High Voltage Test : 2 KV between terminal and instrument case. Ambient : 15-45 degree C , RH 75 % average, 90 % maximum Resistance Box : 0 to 100 ohms & 0 to 500 ohms(5 steps of 100 ohms)
229	Rheostat :	229	
	a) Rheostat 25 Ohms		This adjustable resistor for regulating electric current should have three terminal provisions, and can also be used to vary a DC potential smoothly from zero to maximum. It should consist of resistance wire wound on a former, which should be made form solid drawn hexagonal steel tube vitreous enameled, with good mechanical strength and sturdiness. The Brush gear should slides on a highly polished square slide rod. The brush should be copper graphite with pigtail connections. The brush should be housed in a slider knob of moulded Bakelite designed for easy handling. Tolerance on resistance value : + 20% to -5% Temperature Rise : 375 oC Maximum working voltage : 500 v Ambient temperature : 0 – 45 oC The temp. rise above ambient temp. should with rheostat mounted vertically in free air, with hotter end of the winding above the brush. Tube size : 2" Tube length : 16" Current : 5 A Ohms : 25 No of tubes : single □
	b) Rheostat 100 Ohms		100 Ohms
	c) Rheostat 500 Ohms		500 Ohms
230	Ammeter	230	
	a) 0 to 1 Amp (DC)		0 to 1 Amp
	b) 0 to Amp (DC)		0 to Amp
	c) 0 to 10 Amp (AC, DC)		0 to 10 Amp
	d) 0 to 30 Amp (AC, DC)		0 to 30 Amp
231	Volt meter	231	

	a) 0 to 1 volt (DC)		Portable laboratory type direct indicating meter should be housed in ele. Grade phenolic or backelite or ebonite case .It should have banana terminals with permanent marking of indicating of range and terminals .It should have knife edged pointer and antiparallax mirror. It should be moving coil rectifier type.
	b) 0 to 4 volt (DC)		0 to 4 volt
	c) 0 to 5 volt (DC)		Portable laboratory type direct indicating meter should be housed in ele. Grade phenolic or backelite or ebonite case .It should have banana terminals with permanent marking of indicating of range and terminals It should have knife edged pointer and antiparallax mirror. It should be moving coil rectifier type. □
	d) 0 to 10 volt (DC)		Portable laboratory type direct indicating meter should be housed in ele. Grade phenolic or backelite or ebonite case .It should have banana terminals with permanent marking of indicating of range and terminals It should have knife edged pointer and antiparallax mirror. It should be moving coil rectifier type.
	e) 0 to 50 volt (DC)		Volt meter with stands 0 - 50 volt (DC) Portable laboratory type direct indicating meter should be housed in ele. Grade phenolic or backelite or ebonite case .It should have banana terminals with permanent marking of indicating of range and terminals. It should have knife edged pointer and antiparallax mirror. It should be moving coil rectifier type.
	f) 0 to 25 volt (DC)		0 to 25 volt
232	Millivoltmeter	232	
	a) 0 to 5 mV		Portable laboratory type direct indicating meter should be housed in ele. Grade phenolic or backelite or ebonite case .It should have banana terminals with permanent marking of indicating of range and terminals.It should have knife edged pointer and antiparallax mirror. It should be moving coil rectifier type.
	b) 0 to 50 mV		Portable laboratory type direct indicating meter should be housed in ele. Grade phenolic or backelite or ebonite case .It should have banana terminals with permanent marking of indicating of range and terminals.It should have knife edged pointer and antiparallax mirror. It should be moving coil rectifier type.
	Digital Millivoltmeter		
	a) 0 to 200mv		Portable laboratory type direct indicating meter should be housed in ele. Grade phenolic or backelite or ebonite case .It should have banana terminals with permanent marking of indicating of range and terminals.It should have knife edged pointer and antiparallax mirror. It should be moving coil rectifier type.Provided with LED display
233	Resistance coils (5 Ohms, 10 Ohms, 50 Ohms,100 Ohms)	233	It should be kenthal wire coiled and housed in good quality bakelite case. It should have banana terminals with permanent marking of indicating of range and terminals.

234	PH meter	234	pH Range : 0 – 14 pH Millivolt Range : 0 - + 1999 mV Standardization Range : + 2 pH approx. Temp. Compensation : 0 to 100 oC (manual) Display : 4 – digit LED with automatic polarity & decimal point, mode annunciation by LED lamps Slope Correction : 80 % to 105 % Repeatability : + 0.01 % pH + 1 digit; + 1 mV + 1 digit Resolution : 0.01 pH; 1 mV Polarizing Current : 10 microampere Power : 230 V + 10 % , 50 Hz. Accessories : A pair of electrodes or combined (glass and calomel) with stand and manual.
235	Charger for battery accumulator	235	It should be specially designed to give constant output and should having double wound transformers and full wave rectifier. Built in nicely finished box with on/off switch, jewel light ,fuse and ampere-meter. Input voltage 230 V A.C and 6,12,18,24 volts D.C outputs at 1 Amp
236	12 volt hand operated Dynamo lachlanchacell denial cell, Weston cell,acidic cell, den, accumulator, alkali cell with enable resistances	236	Cell consist of copper pot of approximately size 5.5*3.5 inchempty porous pot and zinc, Superior quality.
237	Multimeter Analog & Digital	237	Specification: Size(HxWxD):100mmx64mmx35mm Weight:125g Battery: one 1.5v AA cell Ranges: DC Voltage: 0 - 2.5 - 10 - 50 - 250 - 500V AC Voltage: 0 - 10 - 50 - 250 - 500V DC Current: 500µA - 10mA - 250mA Resistance: 2k ohms, 200k ohms (x10-x1k) Battery test: 1.5V AA, Popular 9V Accuracy: ±4.0% Full range
238	Battery eliminator	238	Those should be built in nicely finished steel cabinets having lock type terminals, on / off switch and jewel light .Full wave bridge rectifiers and double wound transformers are to be used with copper wire and high grade laminations are used to avoid losses. input 230 Volts A.C & D.C outputs of 2 -18 volts at 5 Amp.