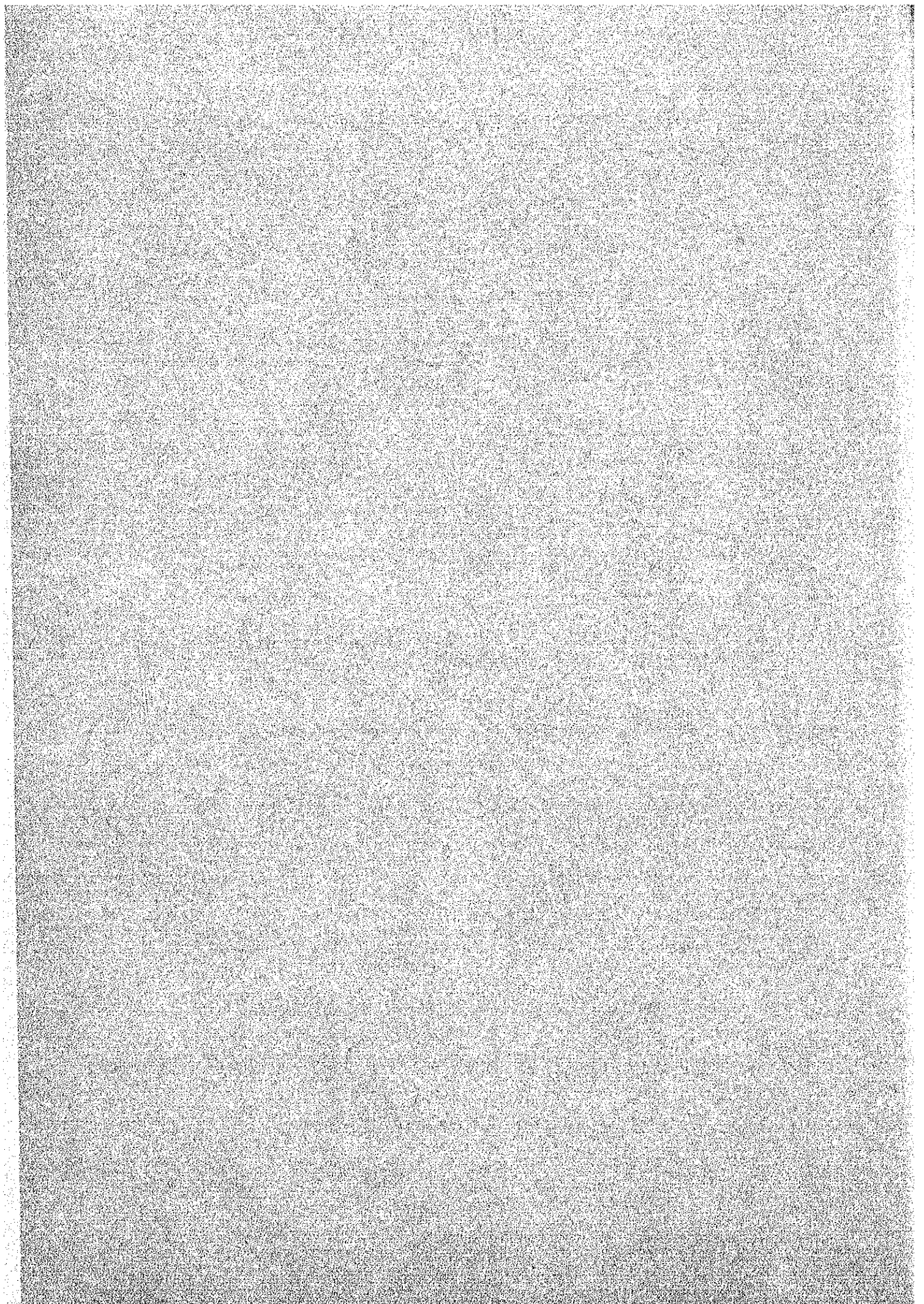


I-2 訓練実習機材要求リスト



1. MECHANICS

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
1	Micrometer	Outside, friction, (0 - 12") (0 - 300 mm) size : .00003" (0 - 6 h) Standard features: Carbide measuring faces Friction or ratchet stop Spindle lock clamp (except non-rotating spindle) Satin chromed sleeve thimble Furnish with standard bar (up to 12" or 300 mm. size) Supplied with fitted carrying case.	2	C	
2	Micrometer	Digit-outside (0 - 1) (0 - 25 mm) Standard features: Flatness or measuring face ----- .000030" Parallelism ----- .000050"(1" model) Accuracy ----- .0001" Carbide-tipped not or spindle Friction stop Supplied with standards fitted carrying cases, instruction included.	6	B	
3	Micrometer	Digit-outside "Combimike (0 - 1) (0 - 25 mm) Standard features: Flatness, anvil and spindle ----- .0003 mm Parallelism ----- .0006 mm Accuracy ----- .0001 mm (Thimble) Dia. of measuring faces ----- 6.35 mm Positive locking clamp Ratchet stop for exact and repetitive readings Clear graduation on satin chrome finish	6	B	
4	Micrometers	Point (0 - 1") (0 - 25 mm) Standard features: Measuring points ----- 0.12" radius Carbide tips Accuracy ----- .001"	6	C	
5	Micrometers	"Disk Type", outside, (0 - 1") (0 - 25 mm) Standard features: Flatness ----- .00004 Accuracy of parallelism ----- .00015" Disc type of anvil and spindle Disc dia. ----- 12" Thickness at center ----- .030" Positive locking clamp Anvil and spindle hardened and ground	6	C	
6	Micrometers	Outside - (0 - 1") (0 - 25 mm), spherical Anvil type Graduation ----- .0001" Anvil diameter ----- 187 Digital counter	6	C	
7	Combimike	0 - 25 mm, .01 thimble counter, 187 anvil dia.	6	C	
8	Micrometer	Screw thread interchangeable V-anvil type Standard features: V-anvil ----- 60° Ratchet stop Conical spindle Satin chrome finished Adjustable anvil Fitted carrying case			
9	Uni-Mike	Interchangeable Anvil Type - (flat, round, disk) Range ---- (0 - 1") (0 - 25 mm) Standard features: Carbide tipped spindle face Positive locking clamp Friction thimble	3	C	
10	Micrometer	Low Pressure Range (0 - 1") (90 - 25 mm), graduation (.0001" - 0.01 mm) approximately .001gf.	3	C	
11	Claiper, Vernier	Low pressure dial, (0 - 8") (0 - 200 mm) (.001" - 0.01 mm) 50-100gf.	12	B	
12	Pana-Mike	Outside, non-rotating spindle interchangeable Type 13 pairs of individual anvils, index plate for storage, fitted carrying case with instructions.	3	C	

ITEM	NAME OF EQUIPMENT	PECIFICATION	QUANTITY	PRIORITY	REMARK
13	Dial Snap Meters	High accuracy (80 millionths) go-no-go gage (Series 523) Standard features: Flatness ----- on bond of rag Indicating range 1.003" Dial graduation ----- .0001" Two work stoppers furnished Anvil dia. ----- 0.420" Spindle carbide with repetitive measurements Hamertone green baked enamel finished Fitted carrying case	6	C	
14	Holtest - Micrometer	Internal with three measuring points Standard features: Setting rings - serialized and marked Extension rod, wrenches screw driver Fitted carrying case Satin chrome Range - .275" - .500" - .0001" reading	3	C	
15	Universal Bevel Protractor	6" - 12" Standard features: Hardened stainless steel Flush reading, no parallel error with magnifying glass Height gage attachment Fine adjustment knob Positive rigid locking clamps	3	D	
16	Caliper checker	Outside jaw check points and inside jaw check: .500", 1", 2", 4", 6", 8", 10", 12" height checking points: 2", 4", 6", 10", 12", 13 1/2", 15" additional thin blade included - .105"	3	D	
17	Thickness gages	(Metric and English) tapered and straight leaves: .0015-.002-.003-.006-.008-.010-.012-0.15 ---- 9 leaves .004" thru .025" by .001 step -----22 leaves	2	D	
18	Radius Gages	Range 1/4" by 64th - 30 leaves	2	D	
19	Pitch Gages	Witworth 55°, 4 - 42 TPI -- 30 leaves	3	D	
20	Pitch Gages	Unified 60°, 4 - 42 TPI --- 30 leaves	3	D	
21	Pitch Gages	Metric 0.4 - 0.5 - 0.75 - 1.0 - 1.125 - 1.5 - 1.75 - 2.0 - 2.5 - 3.0 - 3.5 - 4.0 - 4.5 - 5.0 - 5.5 - 6.0 - 6.5 - 7.0mm (18 leaves)	3	D	
22	Pocket Comparator	With illumination attachment Angle Grid 1° x 90° - Radius Grid .5 mm x 10 mm	3	D	
23	Small Hole Gages	.125" - .200" (3 - 5 mm) 3 5/8" over-all length - .880" depth Standard features: Gaging surface-fall round and flat bottom Knurled knob with a micrometer Gaging surface fully hardened Supplied W-4 gages in a filled case	2	D	
24	Telescoping Gages	Set of 6 (5/16 to 6") - (8 - 12.7 mm) (English and Metric) Standard features: Uniform contact pressure Constant spring tension Rigid handle with self centering features Satin chrome finished Fitted carrying case	2	C	
25	Gage Block Set	81 pieces in a set-series - 516 with Federal (English and Metric) specifications GGE-G-158 Grade (AA) Grade 9 blocks - .1001 - 1.009 in .0001" steps -- 1 (AA) 49 blocks - .101 - .149 in .001" steps ---- 2 (A+) 19 blocks - .050 - .950 in .050" steps ---- 3 (A&B) 4 blocks - 1.000 - 4.00 in 1.0 steps ----- (B)	1	A	
26	Optical Parallels	Dia. - 1.190" with thickness measurements fitted carrying case	1	C	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
27	E-Type Height Master	Standard features: Digital counter Staggared measuring block configuration Smallest reading .0001" Height capacity 36"	2	A	
28	High Precision Universal Dividing Heads	(Super alfa 2) 2 Standard features: Center height ----- 250 mm Bore of spindle ----- 34 mm Morse taper in spindle --- 5 Morse taper in tailstock-- 3 Division ratio ----- 1 : 40 Possible number of division including prime numbers ----- 2 : 400 Thread ground worm Phosphor bronze wormwheel approx. weight ----- 270 kgs. Equipments: 1 pc. tailstock with center 2 pcs. indexing plates, holes (15-18-20-23-27-31-37- 41-47) (17-19-21-24-29-33-39- 43-49) 2 pcs. indexing plates, slots (16-36) (42-60) 1 set of 16 indexing chage gears (24-24-28-32-40-44- 48-56-64-68-72-80-84- 86-96-100) 1 pc. quadrant with 3 shaft 1 pc. carrier with center 1 pc. spindle protection ring 1 pc. adjustable support for long workpieces 1 pc. table for divisions 1 pc. adjusting keys an instruction Manual Indexing Systems: Direct - Simple Indirect Differential - Angular-short Spiral Cutting long spiral cutting - Bevel Gears Cutting	2	A	
29	Block Granite Surface Plates	Mitutoyo (Series S17) Standard features: No. - 517 - 311 Size - 450 x 300 x 100 mm or 18 x 12 x 4 inch Flatness - 6(235) ; 4(155) mm (millionth) Straightness - 2 ; 1 mm/100 mm Weight - 40 kgs. or 88 lbs. Stands No. S17 - 203 with levelling screws. 1 Micro Jack No. 7850 Range 50 - 65 mm Graduation 0.01 mm Loading capacity - 600 kg	2	A	
30	Digital Count-Mite	Metric : (.01 - 300 mm) ; English : (2 - 4") Standard features: Double digital counter Dual directional counter Carbide tipped scriber Chrome plates double seams Fine-adjusting wheel and lock Hardened bottom surface Wooden case for 24" and 300 mm	1	B	
31	Dept Gage Attachment	Standard features: Steel ball contact point depth bar: 3.6" long Square holding stem : 1/2" x 1/4" x 4"	2	C	
32	Contact Sensor	2.6 V Mercury batter	2	C	
33	Dial Indicator	Graduation .0001" - 0.001 mm shock proof jeweled bearing Standard features: Vertical mounted Lug on center back Ball type standard contact point Ball radius 5/64"	2	C	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
34	Back Flunger	Dial Indicator Graduation : .0001" - 0.001 mm Accessories: Hole attachment, tip radius - .078" Clamp, capacity - 1/4" flat or round Tool post holder, 1/2 x 1/2", length 6" Universal clamp, with 1/2" & 1/4" dia. counter holes	1	C	
35	Miniature Machine Tool	"EMCO - Unimat - (METAL) Standard features: Center height ----- 36mm (1.42") Distance bet. centers ----- 170mm (6 3/4") Swing bet. centers over side rest ----- 40mm (1 1/2") Over guide column ----- 70mm (2 3/4") Spindle bore diameter ----- (6.5mm) 1/4" Drilling stroke ----- 20mm (3/4") Speed range ----- 365-600 rpm Vertical Drilling Milling Machine: Max. working height ----- 120mm (4 3/4") Throat ----- 85mm (3 3/4") Drilling stroke ----- 20mm (5/4") Swiveling head stock at any angle Thread Cutting Machine: Suitable for cutting metric threads with pitches from 0.5 to 1.5 mm and with threads having pitch from 16 to 56 Kpi.	1	A	
36	Band Sawing Machine	Standard features: Dia. of saw wheel ----- 40 mm Size of table ----- 500 x 600 mm Length saw cut and file band ----- 2,930 mm Max. Height admitted ----- 240 mm Throat ----- 390 mm Cutting speed ----- 70,110,165,205,320,480 Motor Rating ----- 220V, AC Hz Height of machine ----- 54.1" Floor space ----- 1,100 x 650 mm Blades in widths ----- 1/8,5/32,1/4,5/16,13/32,1/2 inch. Number of cutter speeds ----- 6 4-way tilting table Jaw guides of different sizes of blades Soldering apparatus or butt with shear and grinding meter Straight cutting device Band filing attachment and file bands with different sections, as flat and half-round Magnifying glass with lighting Guides swiveling with 30 Gravity operated feed Centrifugal air pump Sets of spanners for the machine Operating instructions	1	A	
42	Gear Shaper	Model HGS-18 Specifications: Max. pitch diameter (external) ----- 220 Max. pitch diameter (internal) ----- 220 Max. pitch external and internal (Module) ----- .6 Max. face width ----- 60 Max. Helix angle ----- 45° Max. length of cutter spindle stroke ----- 75 No. of cutter spindle stroke per minute ----- (14) 99-925 Cutter feeds per stroke per inch ----- (9) diameter of cutter 0.03-0.13 Cutter diameter ----- 100,125 Main Motor ----- 2.25kw Floor space ----- 1,707 x 1,260 Weight (kg) ----- 4,700 with complete tools, cutters, and accessories, made by Tokyo Kikai Seisakusho, Ltd.	1	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
43	Electrical Discharge Machine	<p>Specifications:</p> <p>Machine Tools</p> <p>1. Work tank (WxD) ----- 700 x 500 mm</p> <p>2. Work tank inside (WxDxH)----- 1000x750x500 mm</p> <p>3. Work tank capacity ----- 375</p> <p>4. Table longitudinal travel ----- 350 mm</p> <p>5. Saddle transverse travel ----- 325 (forward 200, backward 125)</p> <p>6. Ram Vertical travel (by hydraulic servo) ----- 250 mm</p> <p>7. Distance bet. ram hose & top of work table ----- 400 - 650 mm</p> <p>8. Max. electrode weight (at pressure of 20 kg/cm²) ----- 150 kg</p> <p>9. Max. workpiece weight (for reference) ----- 1,500 kg</p> <p>10. Max. electrode area when protector is used ----- 550 x 450 mm</p> <p>11. Outside dimensions (WxDxH)----- 1995x2060x2430mm</p> <p>12. Approx. net weight ----- 3,100 kg</p> <p>13. Filtration method ----- 5 (filter-aid precoat and body feed)</p> <p>14. Filtration method ----- 750</p> <p>15. Outside dimensions (WxDxH)----- 1200x1400x1610mm</p> <p>16. Approx. weight ----- 350 kg</p> <p>with complete tools and accessories made by Japan Inc., 100 Sakato, Takatsu-ku Japan</p>	1	A	
44	Universal Toos Milling Machine	<p>Model T-3</p> <p>Taper of spindle bore ----- ISO 7/24 No.40</p> <p>Hole through spindle ----- 18</p> <p>Max. capacity of spring collet ----- 20</p> <p>Distance bet. spindle center line and overarm ----- 65</p> <p>Range of spindle speed (rpm) ----- (18)40-2,000</p> <p>Clamping surface of vertical table ----- 240 x 700</p> <p>Transverse travel of spindle quill ----- 100</p> <p>Cross travel of milling head automatic/manual ----- 390/400</p> <p>Vertical travel of table, automatic/manual (Maximum) ----- 340/350</p> <p>Range of table feeds (mm/min) ----- (48) 8-400</p> <p>Rapid Transverse (mm/min) ----- 1,200</p> <p>Motor (KIV) ----- 2.2</p> <p>Floor space ----- 1,300 x 1,570</p> <p>Net weight (kg) ----- 1,050</p> <p>with complete tools, cutters, and accessories made by Ricken Steel Co., Ltd.</p>	1	A	
45	Universal Gear Hobbing Machine	<p>Model KR-1000</p> <p>Max. diameter (with support) ----- 700</p> <p>Max. diameter (without support)----- 1,000</p> <p>Max. pitch (M) ----- 10</p> <p>Max. transverse of Hob saddle, vertical ----- 450</p> <p>Center distance bet. Hob arbor and work arbor ----- 60-600</p> <p>Diameter of table ----- 700</p> <p>Diameter of table bore ----- 100</p> <p>Diameter of work arbor ----- 40</p> <p>Taper of work arbor fitting (M.T.)-- No. 5</p> <p>Diameter of Hob arbor ----- 32</p> <p>Taper of Hob arbor fitting (M.T.)-- No. 5</p> <p>Max. Hob size (diameter x length)---- 160</p> <p>Max. Hob shift ----- 100</p> <p>Hob speed range (rpm) ----- 40 - 160</p> <p>Vertical feed range (mm/rev.)----- 0.39 - 5.85</p> <p>Horizontal feed range (mm/rev.)----- 0.2 - 2.9</p> <p>Tangential feed range (mm/rev.) ---- 0.2 - 2.9</p> <p>Main Motor (KIV) ----- 5.5</p> <p>Floor space ----- 2,600 x 1,370</p> <p>Net weight (kg) ----- 6,000</p> <p>with complete tools, hobs, and accessories made by Kashifuji Works Ltd., Japan</p>	1	A	
46	Arm Joint Drilling Machine		1	A	
47	Cylindrical Grinder		1	A	
48	Vertical Milling Machine		1	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
49	Carbide tool grinder		1	A	
50	Universal Measuring Machine		1	A	
51	Shore Type Hardness Tester		1	A	
52	Swing-Arm for Shore Hardness Tester		1	A	
53	Rockwell type Hardness Tester		1	A	
54	Brinell Type Hardness Tester		1	A	
55	Vickers Type Hardness Tester		1	A	
56	Portable Hardness Tester		1	A	
57	Hard Scope		1	A	
58	Handx Brinell Hardness Tester		1	A	
59	Rubbbr Hardness Tester	2 type	2	A	
60	Roll Testing Stand for Shore Hardness Tester		1	A	
61	Standard Piece for Spark Test		1	A	
62	Spring testing machine		1	A	
63	Surface Measuring Instrument		1	A	
64	Gear Tooth Comparator		1	A	
65	Surface Grinder		1	B	
66	Hydraulic Press	50 ton	1	B	
67			1	B	

2. WOOD PATTERN MAKING

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARKS
1	Wood Lathe	<p>Patternmaker's, 2HP multi-speed ball bearing motor headstock fully enclosed and completely dustproof. Main and jack spindles are of high carbon steel and turn in heavy-duty deep-groove-type ball bearings. Spindle is bored throughout 3/4" and fitted with No. 3 taper in nose. Main spindle speeds: 575-1160; 1725-3450 RPM 220 volts, 3-phase, 60 cycles. Speed variation is obtained through drum type controller which is fully enclosed and mounted on headstock leg.</p> <p>Hand feed carriage, compound rest and full swivel tail stock with sturdy design with ample bearing surface carefully gibbed and fitted preventing variation and provision for wear. Full swing 360° graduated so that any degree of taper may be bored or turned-length of stock to be turned - 36". Swing over bed 112" complete with cutting tools and other accessories (faceplate, lathe dog, dead and live center)</p>	1	A	
2	Core Box Machine	<p>Capacity: can work straight or elbow diameters from 0 to 7" using special bit 1/2" to 7/8". 1HP with a 1/2 shank 220 volts and single phase motor, 18000 RPM. Complete with all accessories including operating manual (English) complete set of bits from smallest diameter up to 7"</p>	1	A	
3	Wood Band Saw	<p>Capacity: Blade to guard - 13 1/2"</p> <p>Guide to work table - 7 1/4"</p> <p>table: tilts on double-trunious 45° to right 10° size 15 x 15 1/2. Height over all of floor model 67". Height of work table from floor 39 1/4"</p> <p>Length of blade : 98"</p> <p>Blade widths - 3/4"-1/4"-3/8" and 3/4"</p> <p>Wheels: Discs moulded textolite 14" dia. 1 face</p> <p>Bearings: Grease-sealed ball bearings</p> <p>Frame: Heavy welded-steel construction</p> <p>Operating Speed: 2,200 RPM</p> <p>Blade per minute: 41,000</p> <p>Gross weight with motor: 334 lbs.</p> <p>Motor: 1.5 HP, 220 volts 3-phase, 60 cycles</p> <p>complete with accessories and safety guards.</p>	1	A	
4	Spindle Sander	<p>Model B-4</p> <p>Oscillating mechanism and spindle ball bearings run in oil bath, protected by double spindle seal. Spindle can be interchanged in seconds. Table tilts 45° up and down by handwheel and worm gear. Taper pin locates table at square, scale indicator degree of tilt. Locks in any position.</p> <p>Specifications:</p> <p>Spindle sizes (9 complete assemblies) 3/8" - 4" dia.</p> <p>Motor: 1,800 RPM - 1/2 HP 220 volts, 60 cycles 3-phase</p> <p>Spindle Speed: 1,800 RPM</p> <p>Vertical Spindle Oscillation (90 per min.) 1 1/8"</p> <p>Total dimensions: 20" x 24"</p> <p>Table height: 40"</p> <p>Table tilts up and down: 45°</p> <p>Shipping weight: 280 lbs.</p> <p>Furnished with a throat rings and 12 sets abrasive sleeves</p>	1	A	
5	Disc Sander	<p>Model 220</p> <p>Diameter of ground and balanced disc - 20"</p> <p>Motor - 2 HP volts, 60 cycles 3-phase</p> <p>1,750 - 1,200 RPM</p> <p>Table size - 14" x 27"</p> <p>Table tilts up and down - 45°</p> <p>Table adjust vertically - 8"</p> <p>Shipping weight - 500 lbs.</p> <p>Furnished with the following 2 metal discs, one on machine and one extra: miter gauge, dust bag.</p>	1	A	
6	Surface (Thickness Planer)	<p>Capacity: widest 16"</p> <p>Thickest - 8"</p> <p>Thinnest - 1/8"</p> <p>Shortest Butted - 3 1/4"</p> <p>Not Butted - 11"</p>	1	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARKS
6 (cont'd)	Surface (Thickness Planer)	<p>Specifications:</p> <p>Rate of feed: 25' to 70' per minute</p> <p>Frame: one piece casting</p> <p>Cylinder: Four knife round safety 4 1/4" cutting circle</p> <p>Bearings: Lubricated for life ball bearing</p> <p>Feed roll: Four diameter driven on roller bearings power transmitted to rolls through roller chain.</p> <p>Direct motor driven: 7 1/2 HP 3,600 RPM motor and ball bearing totally enclosed; 220 volts, 60 cycles, 3-phase.</p> <p>Furnished with grinding attachment for blades and wheels. Extra plane knives and depth gauge.</p> <p>Belt drive: Pulley mounted on cylinders. Roller bearing counter shaft furnished.</p>	1	A	
7	Jointer	<p>Floor Type</p> <p>Complete with an 8" long Jointer, direct rotor-on-cutterhead drive 4 knives and round cutterhead steel stand with adjustable out and infeed table. Motor, 2 HP 220 volts, 60 cycles 3-phase. Complete accessories: extra set of 4 high speed jointer knives 8" 1 lb set of 2 spring hold downs 3 lbs. Special rear knife safety guard. Manual starter, over-load and underload protection.</p>	1	A	

3. FOUNDRY

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARKS
1	Laboratory Balance	<p>General:</p> <ul style="list-style-type: none"> a. The laboratory balance shall be a deflection type balance with an equal arm enclosed beam. b. The balance shall have a maximum capacity of one (1) kilogram, with a sensitivity of 20 mg. c. The beam shall be graduated to 10 grams by 1/10 d. The equal arm beam shall be directly constructed preferably of heavy cast aluminum with hardened tool steel knife edges and agate bearings. e. Housing and base shall be rigidly constructed preferably of cast aluminum, finished in enamel paint. f. All working parts shall be protected from fumes and dust. g. To be provided with operations, instruction and repair parts manual written in English. <p>Specific:</p> <p>Note: Specifications may be in excess but must not be less than the following:</p> <ul style="list-style-type: none"> a. Capacity: (kg) 1 b. Sensitivity (mg) 20 c. Pans, dia. (mm) 152 d. Beam Graduations, (gm) 10 x 1/10 <p>Accessories:</p> <ul style="list-style-type: none"> a. To be provided with leveling screws and arrest. b. To be supplied with balance weights, brass material, ranging from 1,000 gm to 1 gm set, in appropriate container or carrying case. 		B	
2	Moisture Teller	<p>General:</p> <ul style="list-style-type: none"> a. The moisture teller must use the direct gravimetric method for determining the moisture contents in the moulding sand. b. Electric-heating element and blower to be of the built-in type; equip with adjustable thermostatic regulator and armored thermometer. c. Electric power shall be 60 cycles, 220 V AC, minimum of 1,150 watts total power requirements. d. Body and support shall be constructed from durable material, properly insulated circular casing. e. Portable type. f. Upright model. g. To be provided with instruction and repair parts manual in English. <p>Specific:</p> <ul style="list-style-type: none"> a. Weight of moulding sand per test, (gm) .. 50 gm b. Height, (mm) 500 <p>Accessories:</p> <ul style="list-style-type: none"> a. Built-in timer to control the drying cycle, preferably with pilot light. b. Connecting cord and plug, complete electrical controls. c. Combination scoop and pan grip. d. Receiving pans (2 pcs.) preferably brass. e. Countryweight, 50 grms. 		B	
3	Mould Hardness Tester	<p>General:</p> <ul style="list-style-type: none"> a. The hardness tester shall be for measuring dry sands mould and baked cores. b. The instrument shall meet A.P.S. specifications. 		B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARKS
3 (cont'd)	Mould Hardness Tester	<p>c. It shall be dial-type, portable (pocket-size)</p> <p>d. Body shall be constructed from durable material, face to be glass or any unbreakable, clear transparent material.</p> <p>e. To be provided with instruction material in English.</p> <p>Specific:</p> <p>a. Hardness Range 0-100, one hardness unit increment.</p> <p>b. Accuracy 1% or as to A.F.S. specifications.</p> <p>c. Dia. of Dial Plate (in.) 1-3/4 (45mm) approx.</p> <p>d. Height (in.) 3-1/2 (89mm) approx.</p> <p>Accessories:</p> <p>a. To be provided with maximum-load pointer or maximum reading stop.</p>		B	
4	Mould Hardness Tester	<p>General:</p> <p>a. The mould hardness tester shall be for measuring the surface of green sand molds and cores.</p> <p>b. The instrument shall meet A.F.S. specifications</p> <p>c. It shall be dial-type; portable (pockets-size)</p> <p>d. Body shall be constructed from durable material, face to be glass or any unbreakable, clear transparent material.</p> <p>e. To be provided with instruction material in English.</p> <p>Specific:</p> <p>a. Hardness Range 0-1000, one hardness unit increment</p> <p>b. Accuracy 1% or as to A.F.S. specifications.</p> <p>c. Dia. of Dial Plate (in.) 1-3/4 or (45mm)</p> <p>d. Height (in.) 2-1/2 or (65mm) approx.</p> <p>Accessories:</p> <p>a. To be provided with maximum-load pointer or maximum reading stop.</p>		B	
5	Molding Machines	<p>General:</p> <p>a. The molding machines shall be the jolt squeeze type, suitable in molding patterns, matchplate system.</p> <p>b. The machine should be pneumatically actuated, manual.</p> <p>c. It shall have the minimum of 170 kg jolt capacity and 110 mm squeeze stroke.</p> <p>d. The machine shall rigidly constructed from heavy durable material suitable from given operation. Table to made from cast iron or steel.</p> <p>e. The squeeze and jolt pistons shall be fully enclosed to safe guard from dust, preferably frame-encased.</p> <p>f. All control valves-squeeze, jolt and vibrator, to be accessible.</p> <p>g. The machine's piping connection and fitting must be of heavy duty and must be easily replaced.</p> <p>h. To be provided with instruction operation and repair parts manuals in English.</p> <p>Specific:</p> <p>Note: Specification must be in excess but must not be less than the following:</p>		B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARKS
5 (cont'd)	Molding Machine	<p>a. Capacity of jolt, (kg) 170</p> <p>b. Size of Table, (mm) 420 x 520</p> <p>c. Stroke of squeeze, (mm) 110</p> <p>d. Squeeze Pressure, (kg) 2,500</p> <p>e. Air Pressure (kg/sq/cm) 5.6</p> <p>f. Free air required per mold (Approx.) cu.m. 0.11</p> <p>g. Dia. of pipe line, (mm) 1.90</p> <p>Accessories:</p> <p>a. To be supplied with 50 vibrators with the following specifications:</p> <p>1. Dia. of Piston, (mm) 15</p> <p>2. Length of Piston, (mm) 50</p> <p>3. Dia. of Locking bolt 10</p> <p>4. Air consumption (cu.m./min.) 0.06</p> <p>5. Required Air Pressure (kg.sq.cm.) 5.6</p> <p>b. To be provided with cross rest.</p> <p>c. To be provided with side bench.</p> <p>d. To be provided with blow-valve for cleaning of patterns.</p> <p>e. To be provided with instruction and repair parts manual in English.</p>		B	
6	Permeability Tester	<p>General:</p> <p>a. The permeability tester shall be used for determining green and dry permeability of foundry sands, cores, washes, investment materials, refractories and other porous substances.</p> <p>b. The test shall conform to A.F.S. method using the Standard Stop-watch Method.</p> <p>c. It shall be suitable for testing 10 grams-per-square centimeter pressure on the specimens.</p> <p>d. It shall be provided with easy-to-read engraved calibration, on drum.</p> <p>e. The tester shall be made from durable material, painted finished exterior, mounted on elevated steel stand and base for easy mounting.</p> <p>f. To be provided with instruction and operation manual written in English.</p> <p>Specific:</p> <p>a. Permeability Range 0-10,000</p> <p>b. Min. Weight (kg) 20</p> <p>Accessories:</p> <p>a. To be provided with standard stop watch.</p> <p>b. Mold perm tester shall be rubber faced contact head connected with rubber tubing to an adaptor be., to fit above meter.</p> <p>c. Molds voids tester shall fit above meter.</p> <p>d. To be provided with shell permeability accessory consisting of complete mold, strike-off plate, specimen support, adaptor, hose, contact nozzle and mold release agent.</p> <p>e. To be provided with operation, instruction and repair parts manual written in English.</p>		B	
7	Rotating Sand Washer	<p>General:</p> <p>a. The sand washer shall be used for determining the percentage of clay in molding sand.</p> <p>b. The machine shall be horizontal type.</p> <p>c. Rotation shall be powered by an electric motor, single phase, 60 cycles, 220 volts, preferably through a worm gear reducer directly coupled to the spindle shafting.</p>		B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
7 (cont'd)	Rotating Sand Washer	<p>d. Minimum of four bottle containers, glass with syphon connection on each bottle, mounted on cast iron or steel rotating arms, detachable type.</p> <p>e. Body and frame to be made from durable materials provided with integral base for motor drive.</p> <p>f. To be provided with instruction and repair parts manual in English.</p> <p>Specific:</p> <p>a. Height, (mm) 440</p> <p>b. Weight, (kg) 55</p> <p>c. Floor Space 350 x 525</p> <p>Accessories:</p> <p>a. A built-in timer interval of one minute.</p> <p>b. Motor to be provided with motor controls connecting cord and plug.</p> <p>c. Spare bottle.</p> <p>d. Syphon.</p>		B	
8	Sand Blender	<p>General:</p> <p>a. The sand blender shall be suitable in preparing green moulding sands, portable type.</p> <p>b. The machine shall be capable of preparing 5 cu.m. per hour.</p> <p>c. The blending action shall be actuated by 2 H.P. Electric Motor Operating on 220 volts AC, 60 cycles, 3 phase power source.</p> <p>d. Blending system shall be from special steel or suitable material stick to an endless gun belt. Other machine parts shall be constructed from durable material permitting high performance and continuous service.</p> <p>e. Feeding system of the machine shall be manual.</p> <p>f. Outlet guide plate shall be adjustable, permitting different distance of throwing out of sands.</p> <p>g. The sand separating device shall be mechanically actuated, preferably spring for ease in operation.</p> <p>h. Belt tension adjustment must be incorporated into the machine, permitting adjustment even machine is in operation.</p> <p>i. To be provided with instruction, operation and repair parts manual written in English.</p>		B	
9	Sand Blender	<p>Specification:</p> <p>Note: Specification may be excess but not less than the following:</p> <p>a. Capacity per hour (cu.m.) 5</p> <p>b. Area of hopper opening (mm) 500</p> <p>c. Motor H.P. 1</p> <p>R.P.M. 1,800</p>		B	
10	Microscope	<p>This microscope is ideal for Laboratory in Foundry. It is use for investigating the grain structure of formation of the Specimen. A manual for maintenance and operating it must be provided and written in English.</p>		B	
11	Sand Muller	<p>General:</p> <p>a. The sand muller shall be suited for squeezing, treading, and kneading core mixtures used in foundry.</p> <p>b. The machine shall be equipped with bolt-connected rubber lined rollers and ploughs. System must be assured to provide constant roller pressure on the sand to be muller.</p> <p>c. Mulling action to be actuated thru an electric motor, motor drive on 220 V AC, 3 phase, 60 cycles power source.</p> <p>d. Mulling pan to be constructed from durable material, preferably of mild steel or cast iron, suitable for given operation.</p>		B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
11 (cont'd)	Sand Muller	<p>e. Provision for ease in inner lining replacement must be provided, so with easily worn-out parts such as rollers.</p> <p>f. Bottom discharge gate shall be lever operated preferably using quick-release lever mechanism.</p> <p>g. The machine shall be able to mill more or less 0.07 cu. meter of sand per batch.</p> <p>h. Sand muller shall be upright, mounted on elevated steel stand, motor base to be integral with machine base for simplicity in installation. It must be supplied with appropriate mounting bolts.</p> <p>i. To be provided with instruction, operation and repair parts manual written in English.</p> <p>Accessories:</p> <p>a. Motor controls includes magnetic starter.</p> <p>Specific:</p> <p>a. Min. capacity per batch, (cu.m.) 0.07 (more or less)</p> <p>b. Min. RPM of rollers.</p> <p>c. Motor - HP 3 RPM 1,800</p> <p>Accessories:</p> <p>a. Motor control includes magnetic starter, push button switch, connecting cord and plug.</p>		B	
12	Sand Remarks	<p>General:</p> <p>a. Sand rammer shall be used to prepare testing specimens or samples of sands.</p> <p>b. Size of specimen shall be 50 mm dia. by 50 dia. mm high, more or less.</p> <p>c. Hand actuated weight raising device.</p> <p>d. Base and support to be constructed from durable materials. Ramming weight shall be able to resist wear. Plunger head shall be designed to prevent binding and withstand cutting by sand.</p> <p>e. To be provided with instruction manual in English.</p> <p>Specific:</p> <p>a. Minimum size of sand specimen, (mm²) .. 50 dia. x 50 h.</p> <p>b. Weight, (kg) 25</p> <p>c. Height, (mm) 545</p> <p>Accessories:</p> <p>a. Sand filling test rest</p> <p>b. Sand filling tube</p> <p>c. Sand stripping bar</p> <p>d. Split mould for specimen</p> <p>e. Optional - Specimen tube conditioner to safeguard accuracy and reproducibility of the test.</p>		B	
13	Universal Sand Strength Test Machine	<p>General:</p> <p>a. The universal sand strength test machine shall be used for conducting various types of test of the strength of moulding sand, namely - compression, shear, tensile and traverse strength of green sand, dry sand and core sand.</p> <p>b. The machine shall be of the pendulum type and must conform to A.F.S. specifications.</p> <p>c. It shall be motor driven, with electrical connections for 220V, AC, single phase, 60 cycles.</p> <p>d. The machine shall be constructed from durable material and easily installed.</p> <p>e. The machine can easily be converted from one test set-up to another, preferably without the use of tools.</p> <p>f. To be provided with instruction and operation manual written in English.</p> <p>Specific:</p> <p>Note: Specification must not be in excess but must not be less than the following:</p>		B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
13 (cont'd)	Universal Sand Strength Test Machine	<p>a. Range:</p> <p>a. A.F.S. Green shear 1 kg/sq.cm</p> <p>b. A.F.S. Dry shear 5 - do -</p> <p>c. A.F.S. Tensile core 25 - do -</p> <p>d. Core paste 25 - do -</p> <p>e. A.F.S. Green compression 1.3 - do -</p> <p>f. A.F.S. Dry compression .. 6.6 - do -</p> <p>b. Accuracy</p> <p>1% of estimated load or as to A.F.S. specifications.</p> <p>c. Scale: METRIC</p> <p>Accessories:</p> <p>a. The test machine shall be provided with the following sand testing accessories:</p> <p>(a) High dry strength accessories shall have a capacity of the following:</p> <p>Compression - 20 kg/sq.cm</p> <p>Shear - 15 kg/sq.cm</p> <p>(b) Deformation and toughness accessory consisting of durable arm, preferably Aluminum with pivot bearing and special dial indicator, to be mounted on the free end of the deformation tester arm.</p> <p>(c) Shear strength attachment consisting of TW hands, for determining green and dry shear strength of moulding sand.</p> <p>(d) Green tensile strength accessory shall be ideal for both green and dry tensile strength testing of moulding sand.</p> <p>(e) Splitting strength accessory consisting of test hands.</p> <p>b. Motor drive assembly shall consist of electric motor, reduction gears, control switch and automatic reversing switch, connecting cord and plug.</p> <p>c. To be provided with necessary service tools, manual of instruction written in English.</p>		B	
14	Stationary Rotary Breaker Screen	<p>General Description:</p> <p>a. The breaker screen machine is used for crushing the back sand after pouring, to pieces and shifting it.</p> <p>b. All working parts such as the screen and the like are accommodated in the enclosed cover to avoid scattering the dust.</p> <p>c. Should have a dust collector attachment.</p> <p>Specifications:</p> <p>Size of machine (mm) 1,630 length 1,000 wide 1,300 height</p> <p>Size of Screen (mm) 420 dia. 950 length</p> <p>No. of Revolution 27 R.P.M.</p> <p>Required Horse Power 1 HP reduction gear motor, 3 phase, 220 volts, 60 cycles.</p> <p>Treating capacity 1-10 (4-60 mesh)</p> <p>Hand book of Operating Manual Written in English</p> <p>Note: All electrical connection should be 3 phase, 220 Volts, 60 cycles.</p>		B	
15	Shot Blast	<p>General Description:</p> <p>a. The Shot Blast Machine is ideal for cleaning small and medium size castings.</p> <p>b. The table rotates slowly and the shot is projected upon the work continuously from impeller unit.</p> <p>c. An electric timer is attached to stop the operation automatically and to show the stoppage by attached signal lamp.</p> <p>d. Bucket elevator is of belt and bucket, centrifugal discharge type, enclosed with steel casing and drives with reduction gear motor.</p>		B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
15 (cont'd)	Shot Blast	<p>e. Dust collector consists of fan and cyclone and is connected to the body of machine with duct.</p> <p>Specifications:</p> <p>Size of Cabinet (mm) 1,350.00 diameter 1,800 height</p> <p>Impeller dia. x width (mm) .. 360 dia. x 62</p> <p>Dia. of work table (mm) 1,200.00</p> <p>No. of Revolution of work table ... 3 R.P.M.</p> <p>Maximum size of work cleaned (mm) 1,100 dia. x 500 height</p> <p>Maximum weight of work cleaned (kg) 700</p> <p>Cleaning capacity depending upon job 250-450 tons per month</p> <p>Electric motor for impeller.. 5 H.P. x 4P x 2 sets 3 phase, 220 volts, 60 cycles.</p> <p>Dia. for work table 100W double stage cycle reduction gear motor</p> <p>Dust collector Model D.C. 2 with 2 HP x 2 P. vertical shaft motor</p> <p>Switch attachment Switch board, impeller blades, control cage, distributor and one set of tools for lifting.</p> <p>Steel grits (1,000 kgs.) S.A.E. No. 550</p> <p>Air compressor for the shot blast machine.</p> <p>1 copy of Installation and Operating Manual written in English</p> <p>Note: All electrical connection should be 3 phase 220 volts, 60 cycles.</p>		B	
16	"D" Shatter Tester	<p>Height 50"</p> <p>Base 12" x 15"</p> <p>Power single phase, 220 volts, 60 cycles, 120 watts</p> <p>Net weight 120 lbs.</p> <p>Shipping weight 130 lbs.</p>	1	B	
17	Auto Clay	<p>Power Single phase 220 volts, 60 cycles 120 watts</p> <p>Height 28 lbs.</p> <p>Base 8 7/8" x 13 1/4"</p> <p>Net weight 20 lbs.</p> <p>Shipping weight 35 lbs.</p>	1	B	
18	Rapid Sand Washer	<p>Power Single phase, 220 volts, 60 cycles</p> <p>Height 12"</p> <p>Base 5"</p> <p>Net weight 6 1/2 lbs.</p> <p>Shipping weight 11 lbs.</p> <p>Extra glass 2 pcs.</p>	1	B	
19	Hydrometer Graduate	<p>Height 17"</p> <p>Diameter 2 1/2"</p> <p>Net weight 1 lb.</p> <p>Shipping weight 4 lbs.</p>	1	B	
20	Ferrotemp Immersion Pyrometer	<p>Length 63"</p> <p>Temperature range .. 0-3000 degrees F</p> <p>Meter temperature scale 6" long</p> <p>Subgraduation 25 degrees</p>	2	A	
21	Volatite Apparatus	<p>#503</p> <p>Temperature Range .. 900°F - 1742°F</p> <p>Attachments 6 pcs. crucibles and covers 3 pcs. tongs and pallets for the crucibles</p>	6	B	
22	Muffle Furnace	<p>Inside Dimensions .. 4 3/4" x 3 3/4" x 9"</p> <p>Outside dimensions.. 11" x 16" x 18 1/2"</p> <p>Power..... 3 phase, 220 volts, 60 cycles, 2,240 watts</p> <p>Temperature range = 250°F - 2,000°F</p> <p>Net weight 40 lbs.</p> <p>Shipping weight 55 lbs.</p>	1	B	
23	Drying Oven	<p>Inside dimension 11" x 17" x 14"</p> <p>Base dimension..... 7 1/2" x 23 1/2"</p>	1	B	

4. METAL

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
1	Welder	Lincoln Ideal Arc - Model H35-400, Type K 1258, 3-phase current range - 50 to 500 Dimensions 30-3/4" x 22-7/8" x 35" with complete accessories.	1	A	
2	Mechanical Bender	Di-Arco for rods, bars and pipes.	1	A	

5. REFRIGERATION AND AIR CONDITIONING

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
1	Basic Refrigeration and Air-Conditioning Trainer	<p>Specifications:</p> <p>Compressor, single-phase, 220 VAC, 60 cycles, semi-hermetic motor compressor or open type belt driven condensing unit, 1/2 hp.</p> <p>Evaporator, copper tube coils with aluminium or copper fins, variable-speed blower motor, 220 VAC, single-phase, 60 cycles.</p> <p>Condenser, same as evaporator.</p> <p>Refrigerant, operates on refrigerant-12.</p> <p>Control equipment, combination low-pressure, high pressure cut-out, thermostatic control with a range of minus 20 degrees F to plus 50 degrees F.</p> <p>Heat pump operation, with valves to change from cooling to heating operation.</p> <p>Complete with pressure gauges, thermometer wells, pressure gauges and standard accessories and mounting stand.</p>	1	A	
2	Commercial Refrigeration and Air-Conditioning Trainer	<p>Specifications:</p> <p>Compressor, single-phase, 220 VAC, 60 cycles, semi-hermetic or open type belt driven motor-compressor, 1 hp.</p> <p>Evaporator, copper tube coils, aluminium or copper fins variable speed motors for blowers 220 VAC, single phase, 60 cycles, 2 units.</p> <p>Condenser, forced draft air cooled condenser to match motor-compressor capacity, variable speed motor for blower fan, 220 VAC single phase 60 cycles, copper tube coils, aluminium or copper fins.</p> <p>Refrigerant, operates on refrigerant-12.</p> <p>Control equipment, combination low and high pressure cut-out, thermostatic controls for each blower coil evaporator solenoid valve with adjustable range of minus 20 degrees F to plus 50 degrees F.</p> <p>Solenoid valves to make all systems set-up possible.</p> <p>Complete with heat exchanger, oil separator, section line accumulator, by pass lines, flow-meter before each evaporators calibrated in pounds per minute, adaption for capillary tube, automatic expansion valve, and thermostatic expansion, valve operation, mounting stand and standard accessories.</p>	1	A	
3	Commercial Refrigeration Freezer Trainer Unit	<p>With Electric Heater Defrost</p> <p>Specifications:</p> <p>Compressor, 1/2hp semi-hermetic or open type motor-compressor unit, 220 VAC, single-phase, 60 cycles.</p> <p>Condenser, air cooled with variable speed motor fan blower, copper tube coils and aluminium or copper fins to motor-compressor capacity.</p> <p>Evaporator, forced convection electric defrost coil with timer defrost control solenoid valve, thermostatic expansion valve.</p> <p>Refrigerant, to operate on refrigerant-12.</p> <p>Complete with liquid receiver, heat exchanger, oil separator with by-pass, suction accumulator with by-pass, drier filter with replaceable dehydrant, sight glass low and high pressure cut-out, thermostat with range of minus 20 degrees F to Plus 50 degrees F, thermometer wells, pressure gauges and standard accessories.</p>	1	A	
4	Commercial Freezer Trainer Unit	<p>Hot-Gas Defrost Type</p> <p>Specifications:</p> <p>Same as Item 3 except electric heater defrost where Hot-Gas defrost set up with re-evaporator coil on suction line is used. Complete with standard accessories and mounting stand.</p>	1	A	
5	Air-Conditioner Trainer	<p>Specifications:</p> <p>Compressor, 3 hp semi-hermetic or open type motor-compressor unit, 3 phase, 220 VAC, 60 cycles controlled by star-delta type motor starter.</p> <p>Condenser, evaporative type, motors for blower and water-pump 220 Volts, 60 cycles, A-C, copper tube coils, and water regulating valve.</p> <p>Air Handling unit, to match capacity of condensing unit with centrifugal type blower, motor 220 VAC, 60 cycles.</p>	1	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
5 (cont'd)	Air-Conditioner Trainer	Control equipment to include low and high pressure, cut-out, Temperature control, oil pressure safety switch, crankcase heater, liquid line solenoid valve, cooling thermostat, coil defrost, sequence control or properly interlocked. Complete with standard accessories and mounting stand.	1	A	
6	Industrial Type Refrigeration Trainer	Multiple Evaporator Type Specifications: Compressor, 3 Hp 3-phase, semi-hermetic or open type unit 220 VAC, 60 cycles. Condenser, water-cooled, steel and tube type with water regulator at by-pass to match capacity of condensing unit. Cooling tower, supply cooling water to match capacity of condensing unit, operate on 220 VAC, 60 cycles. Auxiliary apparatus unit, oil separator, liquid line heat exchanger, vaporator pressure regulators, flow-meter in pounds of R-12 per minute, crankcase heater, liquid line solenoid, oil pressure safety switch, low and high pressure cut-out, thermometer wells, pressure gauges, water temperature switch, centrifugal pump, special valves. Complete with standard accessories and mounting stand.	1	A	
7	Ice-Maker	Block ice, 3 ton capacity, ammonia system, school laboratory model, complete with 4" x 12" x 20" ice cans, brine agitator, brine tank with appropriate insulation, air-agitation for ice cans and standard accessories.	1	B	
8	Low Temperature Unit	Cascade system, e-stage using R-502 and Ethane refrigerants, laboratory model, semi-sealed or open type condensing unit, water-cooled, complete with pressure gauges, thermometer wells on inlet and discharge of compressors, condensers, and evaporators, necessary safety devices, sequence control, electrical interlocks, pressure relief valves or rupture discs, low and high pressure controls for each stage, thermostats and standard accessories, 1 Hp condensing unit for each stage, 1-phase, 220 VAC, 60 cycles.	1	B	
9	Centrifugal Type Chiller	Laboratory model complete with control module, pneumatic controls and air compressor 3-phase, 220 VAC, 60 cycles, complete with standard accessories.	1	B	
10	Compressor for Disassembly	Assembly and testing: Open type reciprocating compressor 1-TR capacity Open type rotary compressor 1-TR capacity Screw-type compressor 3-5-TR capacity Centrifugal type compressor 5-10-TR capacity	1	B	
11	Compressor, Cut-away	To show parts and their operation same as Item 10 to include a hermetic unit.	1	B	
12	Vacuum Pump	2-stage high vacuum type, can pull down to 10 microns blank-off pressure, complete with a solenoid valve to shut off intake of air during shut-off, vacuum indicator, gas ballast and standard accessories.	1	A	
13	Calorimeter	Room equipment for testing refrigerating and room air conditioning equipment capacity, and performance under varying conditions of operation. Complete with plans for installation and brochure for their operation and maintenance.	1	A	
14	Vacuum Indicators	Thermistor or thermocouple type, complete with sensor adaptor for connection to a 1/4" flare union, battery-operated type "D" with metal or leather carrying case.	5	A	
15	Absolute Pressure Manometer	For measuring low pressure graduated in mm. Hg. or inches of HG vacuum.	5	C	
16	Thermometers	Thermistor type, portable, battery-operated, frictionless, shock-resistant, for easy, quick and precise measurement of temperatures up to 600 degrees Fahrenheit, complete with a probe sensing element.	5	C	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
17	Thermometers	Resistance type, measuring range up to 300 degrees Centigrade.	5	C	
18	Thermometers	Thermocouple type, friction free, portable, vibration and shock proof, range up to 300 degrees Centigrade, measures temperature from 6 places, complete with accessories.	5	C	
19	Tachometers	Portable type, speed of shaft can be read directly from scale range 500/1,000/2,000/5,000 rpm, complete with standard accessories.	5	C	
20	Power Panel Board	For testing electric Motors, Room Coolers, Appliances. Specifications: Main Circuit Breaker, 110 amps, 3-phase, 220 VAC Voltmeter, 0-300 VAC with selector switch for each phase Wattmeter, 3-phase, 220 VAC, 5A. Ammeter, 0-30 with selector to measure current for each phase on 3-phase outlets. Ammeter, 0-30 with switch to measure current for outlets used for 220 Volts, 1-phase outlets. Ammeter, 0-20 with switch to measure current for outlets used for 110 Volts, 1-phase outlets. Transformer to step down 220 Volts to 110 Volts on 110 Volts outlets. Mounting stand, 30" x 72" panel board of 1/4" plywood, asbestos top of bench and tool shelf underneath, sliding door, mounted on heavy duty castor wheels.	5	A	
21	Voltmeter-Ammeter	Hook-on heavy duty type, 0/10/30/300 amps. 0/150/300/600 volts AC	5	B	
22	Circuit Tester	Multi-meter for measurement of AC/DC voltages and currents, resistances of motor windings and maintenance work, high sensitivity, rugged construction, portable, complete with standard accessories, high tension probe, shunt clip-on current transformer and portable carrying case.	5	B	
23	Electric Leak Detector	For R-12, R-22, R-500, R-502 refrigerants complete with standard accessories	5	A	
24	Insulation Tester	Hand driven, range up to 100 megohms with leather carrying case.	5	B	
25	Sound Level Meter	Range 30-130 decibels, battery operated, "D" type, complete with standard accessories heavy duty type.	2	C	
26	Manometers	For measuring static pressure velocity pressure and total pressure on ducts, complete with standard accessories, and carrying case.	5	C	
27	Velocimeters	For measuring air velocity on ductworks calibration in feet per minute, complete with standard accessories and carrying case.	2	C	
28	Airconditioner	Package type 10 tons capacity R-22 Air-cooled condenser DX evaporator, Split type "DAIKIN KOGYO" Motor compressor 3-Phase 220 V complete with electrical controls and refrigerant controls and standard accessories.	2	B	
29	Pre-fabricated Walk-in Cooler and Freezer	(Thermodule System) R-22 Refrigeration unit Model LCAM 3 E with standard accessories Hot Gas defrosting method. Cold storage and Freezer room Model PTCO 91209 "DAIKIN KOGYO" 6.48 m ² with standard accessories.	1	B	
30	Grinders	Pedestal Type Motor 1/2 Hp 220 V 1-phase 60 cycle Integral magnetic starter Control Push Button Switch Shaft Dia. 5/8" 1,725 rpm Wheels Size 7" Dia., 1" face, 5/8" Hole Pedestal Base 14 1/4" x 16" Width 23 1/4" Height 47 1/2"	1	B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
30 (cont'd)	Grinders	Accessories Wheel 1" x 6", 120 grit, Silicon carbide Wheel 1" x 6", 80 grit, Aluminium Oxide Twin-lite Safety Shield Drill Grinding Attachment	1	B	
31	Long Shaft Buffer	Pedestal Type Machine Data 1/2 Hp 220V single phase 60 cycle Shaft Dia. 5/8" 1,725 rpm Integral Magnetic Starter Control Push Button Switch Pedestal Base 14 1/2" Width 23 1/4" Height 47 1/2" Accessories Wire Brush 6" Dia. Fine 5/8" Hole Wire Brush 6" Dia. Medium 7/8" Hole Buffing Wheel 48 ply, Fine muslin, cushion type	1	B	
32	Hand Grinder	1/4 Hp Motor 22,000 rpm 220V 60 cycle 1/8 Collect Chuck, 3 prong plug Wheel capacity up to 1" vitrified bond provided with safety lock	1	B	
33	Electric Drill	Capacity 1/2" steel HD Motor; Universal type 220 V 60 cycle 1,500 rpm Standard equipment 3 conductor cord, chuck, chuck key, auxiliary pipe handle, Operation Manual	2	B	
34	Soldering Gun	HD 220V 240/325 Watts Shatter-proof Plastic Housing with extra soldering tips, Changing Tip Wrench, Flux Brush and all purpose Solder.	4	B	
35	Thermal Mobile Charging and Testing Station	Consist of: Hand Truck on Rubber Wheels Vacuum Pump Single Stage 1.0 CFM 1/4" Flare Motor 1/4 Hp 220V 1,750 rpm 60 cycle Charging and testing Mainfold Complete with pressure Gauge 0-500 psi and Compound Gauges 30" Hg-0-250 psi, 60" Charging Lines Charging Cylinder 10 Lb. with Tripod type Frame, A scale in 4 oz. divisions, a Flexible line connects the bottom. Of a Gauge Assembly and hand valve. Overall height 26". The top Bond has a piercing valve to permit use of a pyrex gauge glass and a pressure gauge to indicate actual temperature of refrigerant.	2	B	
36	AC Welder	Specifications: Rating, Output Current/Amps 225 Current Ranges/Amps 40-225 Volts 25 Input Power Volts 208/230 V 1-phase 60 cycle Current AT Rated Load/Amps 50 Current-Idle/Amp 2.4 Accessories Head Shield with Visibility Lens, Ground Clamp Rated 300 Amp. Electrode Holder and Instruction Handbook	2	B	
37	Welding and Cutting Outfits	Heavy Duty, Single Stage Consists of: Single Stage Oxygen Regulators Single Stage Acetylene Regulators Welding Torch with Mixer Welding tips 3, 5, 7 (3 Tips) Hose 3/16" Twin 20 ft. Spark lighter Welding Goggles #1, Cutting tip #2 Instructional Manual	2	B	
38	Machinist Vises	Without Swivel Base Jaw width 5" Maximum Opening 8" Double strength Malleable Iron Castings, Broached and Keyed Cylindrical Spindle Housing	6	B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
39	Air Compressor	<p>Specifications:</p> <p>Air Displacement 9.0 CFM Air Delivery 7.0 CFM at 50 psi Motor 1 1/2 Hp 220V 60 cycle 1-Phase Capacitor Start Automatic Control, Pressure Switch 120-150 psi range Safety Valve Setting 165 psi Tank 20 gallon Compressor Single Piston 2 3/8 Bore x 2" Stroke Twin Pressure Gauge 0-200 psi Carriage 10" Dia. Wheels</p>	2	B	
40	Safety Outfits	<p>8.0 to 12 CFM Air Supply</p> <p>Outfits Includes:</p> <p>Spray Gun-Quick Detachable Stem 1 Quart Metal Cup Suction Feed Cup Attachment Air Hose with quick Detachable Connection one end and Standard Connection 3/16" x 35 ft. Air Transformer, Angle Adapter, Duster Gun</p>	4	B	
41	Tool Storage Cabinet (Wood)	<p>Interior Illuminated 48" Fluorescent</p> <p>84" High 60" Wide 22" Deep with specially designed hooks and hinges. Double Opening and Horizontal Shelves.</p>	2	B	
42	Refrigeration Hand Tools	<p>For 20 Students</p> <p>Consisting of:</p> <p>5 Reversible Ratchet Wrench 5 Ratchet Adapter Plug 5 Flare Nut Wrench 1/4" 5 Flare Nut Wrench 3/8" 5 Flare Nut Wrench 1/2" 5 Flare Nut Wrench 5/8" 5 Flare Nut Wrench 7/8" 5 Adjustable Wrenches 6" 5 Adjustable Wrenches 8" 5 Adjustable Wrenches 10" 5 Adjustable Wrenches 12" 5 Screw Driver 4" Blade with Plastic Handle 5 Screw Driver 5" Blade " " " 5 Screw Driver 6" " " " " 5 Screw Driver 8" " " " " 5 Screw Driver 9" Blade " " " 5 Socket Wrench Set 17 pcs. Square Drive/Set 5 Angle Box Wrench Set 5 pcs/set 5 Combination Open End and Box Wrench 6 pcs/set 12 points 5 Tube Cutter 1/8" to 3/4 O.D. 5 Flaring Tool 5 Vise Grip Pinch-Off Tool 5 Glass Pocket Thermometer in Steel Case -30 to 120F 5 Dial Pocket Thermometer -40 to 120 F 4 Double Gauge Manifold 5 Open-end Wrench 6 pcs/set 2 Bending Springs 1/4", 3/8", 1/2", 5/8" O.D./set 2 Ball Pien Hammer 12 oz. 2 Soft Face Hammer 8 oz. 2 Hack Saw Frame Tubular Form with 12" Blade 2 Groove Joint Plier 2 Nut Driver Set 14 pcs/set 2 Phillip Screw Driver Points 1 2 Phillip Screw Driver Points 2 2 Phillip Screw Driver Points 3 2 Pipe Wrench 10" HD 2 Pipe Wrench 12" HD 2 Service Valve Kit 2 Quick-Start and Test Lead Kit 4 Pressure Gauge 0-500 psi 4 Compound Gauges 30" Hg. 0-250 psi 4 Sets Charging Hoses (3 different color hoses per set) 2 FA Tube Cutter 3/8" to 2 3/4" O.D. 2 Offset Screw Driver 8" 2 Set Screw Wrenches 3/64" to 3/8" 11 pcs./set 2 Test Plug Kit 2 Inner-Outer Reamer 3/16" to 1 1/2" O.D. 2 Swaging Tool Set 2 Fuse Puller 2 Charge Oil Pump 2 Cap-Tube Gauge 2 Crimper Cutter</p>	2	B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
42 (Cont'd)	Refrigeration Hand Tools	2 Protecto-shield 2 Double-Flaring Tool 2 Long Nose Plier 8" 2 Diagonal Cutting Plier 8" 2 Rule 6 ft. Stop O Master 1 Flaring and Swaging Tool 1 Tube Bender Lever Type 1/4", 3/8", 1/2", 5/8"/set 1 Gear Puller 1 Tin Snip Straight 10" 1 Tin Snip Straight 12" 1 Tin Snip Aviation Type 10" 1 Feeler Gauge 1 Cap-check Kit 2 Refrigeration Demonstrator	2	B	

6. AUTOMOTIVE

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
1	Vacuum and Fuel Pump Tester	Vacuum scale reading, 0-600mm HG fuel pump pressure scale, 0-7 psi., 0-.05 kg/cm ² pressure with adapter, with hanging bracket and oil resistant hose - 1 meter long and with manifold adapter.	2	A	
2	Compression "Cyclo-graph" Tester	Inkless stylus recording the pressure on a card, with pressure on a card, with complete graph cards and flexible extension for reading awkwardly placed plug apertures and contained in a substantial wooden box, 20 kg/cm ² capacity.	4	A	
3	Remote Starter Control	With 2 meter heavy duty leads and 2 heavy clips	3	A	
4	Alternator-Diode Tester	Ammeter scale reading 0-3 amps, ohmmeter scale reading 0-1,000 ohms.	2	A	
5	Dwell Tach Tester	Tachometer, double range 0-1,200 and 0-12,000 rpm, separate scale for reading, 4, 6 and 8 cylinder engines.	3	A	
6	Ignition Tester	0-35 kilovolt range ohmmeter ranges 0-500, 0-5,000, 0-500,000 three (3) 1.52 m leads.	3	A	
7	Timing Light	6/12 V change-over switch 0-5,000 rpm	6	B	
8	Lubricator	Discharge of pressure, 13 kg/cm ² amount of discharge, 5 lit./min., or more air pressure, 7 kg/cm capacity, contained in liter can weight, 41 kg, overall height - 960 mm Accessories, G.R. pressure control valve, H (1.5)	1	A	
9	Carburetor Balancer	Indicating method, float type size - 11.5 mm x 90 mmdia. weight - 200 g.	6	A	
10	Air Compressor	2-Stage, 220 V, 2.2 kW, 3 phase, max. pressure at 12 kg/cm ² air tank capacity at 160 liters.	1	B	
11	Silicon Battery Charger	DC output (rated) - 6/12 volts rated current, 6/3 amperes, voltage adjustment 60 to 12 volts, power supply (AC) - 220 volts.	3	A	
12	Growler	50 to 152 mm, 220 volt, 50 herz	6	B	
13	Car Washer	Discharge pressure 16 kg/cm ² , volume of discharge 40 lit./min. 220V, three phase, 2.2 kW motor drive with water tank capacity at 65 lit. heavy duty discharge hose (with gun) 13 x 10,000 mm.	1	B	
14	Electric Hoist	Capacity 1 ton, lift 4 m, motor 220V, 0.75 kW, for lifting hoisting speed 3.5 m/min traveling speed 24 m/min, minute turning radius 600 mm.	1	B	
15	Steam Cleaner	Quantity of water used 400 lt./h, steam pressure 4-7 kg/cm ² , fuel used white kerosene, fuel consumption 10 lt/h, washing fluid capacity tank 10 lit., ignition method manual, burner special rotary burner, safety devices safety valves and automatic pressure control valve, motor source 250 W, power source 100V dimension 1,235 x 680 x 960 mm, weight 220 kg, accessories, steam hose 6m with gun 1, water hose 6m, detergent in container 1, oiling funnel 1, input cord 6 m.	1	B	
16	Air Lift	(Hydro-Pneumatic) swinging-arm type, 5 tons capacity with standard accessories	1	B	
17	Armature Lathe	(Bench type), 8 cm swing, mica undercutter attachment, distance from base to V block, 9 m operates on 220 volts, AC with single phase motor.	1	A	
18	Pocket Test Meter	Dual scale voltmeter, DC Low range : 0 - 2.5 V High range: 0 - 30 V Test ammeter, DC, 30 ampere	2	A	
19	Oxy-acetylene Welding Set	With complete accessories 20 ft. double line hose, oxygen, regulator, 220-4,000 lb. gauge, acetylene regulator 30-500 lb. gauge; welding goggles; torch lighter lighter, tip range Nos. 1, 3, 5, 7; cutting assembly.	3	B	
20	Welding Machine	Primary voltage - 230V; Primary amperage - 45; Reg. 6 Phase - 60 Hz single; Power Factor - 75%; Arc Amperage - 235; Arc Voltage - 25; Duty Cycle - 20%; Welding Current - 40-235 amp. range; Electrode Range - 1/6" to	3	B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
20 (cont'd)	Welding Machine	7/32"; accessories; 10 meter welding cable with electrode holder; 10 meters ground cable with heavy duty work clamp; power cord 10", double insulated, 20 meters long heavy duty with plug, molded fiber glass welding helmet.	3	B	
21	Disc/Drum Brake Lathe	Drum Lathe specifications: 220V, 60 Herz., single phase motor. max. drum dia. - 40 cms min. drum dia. - 15 cm max. drum dept - 20 cms min. cross slide feed - 0.05 mm max. cross slide feed - 0.050 mm	1	A	
22	Portable Welding Machine	(Engine Drive) Welder: Rated welder output at 25 arc volts - 225 amps. Welding current range - 40 - 225 amps. Drive H.P. required - 20 H.P. gasoline, air cooled.	1	B	
23	Auxiliary Power, Generating Unit	Rating - 220V, 60 herz, single phase Watts - 30,000 watts continuous amps; total from 2 outlet - 12 1/2 amps. max. Operating Speeds: No Load - 3,000 rpm max, Full Load - 2,600 rpm max. Power driven by a 10 Hp engine, gasoline, air cooled	1	C	
24	Engine Cylinder Boring Machine	220V, 60 cps.; min. cylinder dia. 6 cms, max. cylinder 11 cms.	2	D	
25	Spo Welder	Specifications: Heat setting for welding light medium and heavy duty steel sheets, 220V, 60 Hz, with adaptable spot arc shields and 5 meters work lead with clamps.	1	B	
26	Soldering Iron	250 W, 220 V	6	D	
27	Soldering Gun	110W, 150 W, 220 V	6	D	
28	Condensing Plant	Water, electric 220V with all standard accessories, in operating condition and a capacity of 5 liters per hour.	1	C	
29	Bus	Mitsubishi, Fuso, T 951 specifications: Wheel base - 5,100 mm L x W x H - 8,980 x 2,440 x 2,580 Ground clearance - 250 mm Engine - 4 cycle water cooled 8 cylinder diesel Transmission - 5 speed Body - Special designed for educational purpose, Van Type	1	B	
30	Vehicle	Van Type, ISUZU, Elf 250 with specially designed body with generating unit for operating audio-visual equipment which shall include: a) sound system b) 16 mm movie projector and screen c) color T.V., 40 cm, 220 volts A.C. d) slide projector with automatic control Engine - four cylinder diesel engine four-stroke cycle, 74 HP Transmission - 5 speed	1	A	
31	Service Vehicle	Toyota Land Cruiser, four wheel drive, with standard chassis and body; Diesel Engine, 4 cylinder, 4 stroke cycle	1	B	
32	Impact Wrench	Model kW - 14 HP, Bolt capacity 8-16 mm; Drive - 3/8"; Torque Range - 4-35 kg/m; Free speed - 5,600 rpm; Air consumption - 0.35 m ³ /min.	5	B	
33	Impact Wrench	Model kW - 32 GL, Bolt capacity - 20-32; Drive - 1/2"; Torque Range - 35 - 175; Free speed - 3,200 rpm; Air consumption - 1 (m ³ /min.)	2	B	
34	Air Chiseler	Capacity size - 10.2 mm; Blows per minute - 3,500; Air consumption - 0.3 m ³ /min.	2	C	
35	Disc Sander	Capacity size - 127 mm; Free speed - 13,000; Air consumption - 0.4 m ³ /min.	3	C	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
36	Air Drill	Capacity size - 6 mm; Free speed - 2,100 rpm ; Air consumption - 0.3 m ³ /min.	2	C	
37	Wrenches	Socket, Drive - 1/2"; Socket size - 8, 10, 11, 12, 13, 14, 17, 19, 21, 22, 23, 24; 27; Spinner - 300-380 mm; Accessive Handle Bar - 250; Extension Arm - 150; Metal case - 300 x 50; Universal Joint Instructional Materials. (New Engines) (NOTE): All Engines should be provided with all accessories, for operation purposes, radiator, starter, alternator, ignition assy, clutch assy.	6	B	
38	Gasoline Engine	4 - stroke cycle, Overhead Camshaft, hemispherical combustion Engine, water cooled, 1,600 cc, 2 barrel carburator, 4 cylinder, with transmission 4 - speed side shift.	4	A	
39	Gasoline Engine	4 - stroke cycle, 1-type, 4 cylinder, 1,600 cc with 2 barrel carburator, with transmission, 4 speed center shift.	4	A	
40	Rotary Engine	Mazda Rotary, Twin Rotor with 4 barrel carburator with transmission; 5 pseed center shift	3	A	
41	Diesel Engine	4 cylinder, 2,000-2,700 cc; water cooled, OHV with transmission, 4 speed columns shift	2	A	
42	Diesel Engine	6 cylinders, water cooled OHV, 120 HP with transmission 5 - speed	2	A	
43	Gasoline Engine	6 cylinders, overhead Camshaft, 2 barrel carburator	2	A	
44	Automatic Transmission	Aisin Warner Toyoglide, New	4	A	
45	Automatic Transmission	Nissan, New	4	A	
46	Rear Axle Assembly	With brake assembly and axles Non-slip differential type, for passenger cars, New	4	A	
47	Test Bendh, Fuel Injection	Model 5760-101, Manufacturer Diesel Kiki Co., Ltd.	1	A	
48	Tester, Nozzle Assy	Model 5785-250 and 5785-050, manufacturer Diesel Kiki Co., Ltd.	2	A	
49	Smoke Meter	Full flow type, Power source and control unit, Model SM-2 Sensory unit molded SM-2; Manufacturer, Okuda KOKI, Ltd.	2	A	
50	Motor Exhaust Gas Tester	Model NP-EFAW 109 B, Exhaust Co., Meter, Manufacturer Diesel Kiki Co., Ltd.	2	A	
51	Tester, Brake	Model BT-151 DA, Manufacturer Diesel Kiki Co., Ltd.	1	A	
52	Chassis Dynamometer	Model CDM 6000, Manufacturer Diesel Kiki Co., Ltd.	1	A	
53	Tester, Side Slip	Model IM-2235, Copy specification except voltage - Charge to 220V, Single phase, manufacturer Diesel Kiki Co., Ltd.	1	A	
54	Tester, Engine Tune Up	Model PF-D2, PF-V, PF-G, PF-K, PF-E, PF-L, PF-T3; MS-505S of 2 each model, Manufacturer OKUDA KOKI Co., Ltd.	6	A	
55	Dynamic Wheel Balancer	Model YCWB-1000 E, Motor single phase 220 V 440 W AC	1	A	
56	Universal Test Bench	Model FB 500, Manufacturer Fujima Machinery Mfg., Co., Ltd.	1	A	
57	Tester, Light Intensity	Model: Light Matir Tracer, Manufacturer Sanei Kogyo Co., Ltd.	1	A	
58	Chargers, Battery	Combination Quick Charger and as auxiliary starter, Model BS-6561, Manufacturer - Sanei Kogyo Co., Ltd.	2	B	
59	Portable Chargers	Battery Charger, Model Rush - C, Manufacturer Stanley Electric Co., Ltd.	2	B	
60	Wet Valve Refacer	Model VR-700, Manufacturer Nihon Tokusho Kiki Co., Ltd.	1	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
61	Electric Valve Seat Grinder	Model EC-65, Manufacturer Nihon Tokusho Kiki Co., Ltd.	1	A	
62	Brake Drum and Clutch Lathe	Model BDL-250, Manufacture Nihon Tokusho Kiki Co., Ltd.	1	B	
63	Universal Brake, Shoe Grinder	Model BS6-HD Manufacturer Nihon Tokusho Kiki Co., Ltd.	1	A	
64	Lifter	Motor Vehicle, Model YPL - 25, Maker Yasui Sangyo, Ltd.	1	B	
65	Engine Analyzer	Tachometer - 0-2,000; 0-10,000 rpm; Point Drill - 0-1,000 per cent; KV - 0-36; Aperature - 0-18; Ohms - 0-500, 0-5,000, 0-5,000,000; Power Supply - four (D) Batteries, one S volt transistor battery	2	A	
66	Jack, Hydraulic	One of each kind, 5 ton, 1 ton, 3 ton capacity	3	B	
67	Airless Spray Unit	Model ALS, Manufacturer IWATA Co., Ltd.	1	A	
68	Tap and Dies	Metric, in convenient storage box for threading/re-threading common automotive screws and nuts	2	A	
69	Ammeter, D.C.	Portable, multi-range; 0-1; 0-3; 0-10; 0-30 ampere	6	A	
70	Voltmeter DC	Portable, multi-range; 0-1; 0-3; 0-10; 0-30 ampere	6	A	
71	Multitester	Capable of measuring EMF, current, resistance, and with capacity of measuring in millivolts, micro-amperes, and in mega ohms by the use of selector switches, portable and operating on dry cell batteries; can be used for AC and DC circuits.	3	A	
72	Engine Oscilloscope	On stand, good for testing 4-6 and 8 cylinders engine, with standard accessories, operating manual and stand	2	A	
73	Meter, Air Flow	For measuring air velocity at carburetor air, air horn grauated in feet per second and meters per second, air passage dia. not more than 75 mm and measuring capacity 20 meters per second.	6	A	
74	Gauge, Pressure	Bourdon-tube type, capacity 90 psi/7 kg per cm ²	6	C	
75	Gauge, Cylinder Compression	Capacity 20 kg/cm ²	6	C	
76	Micrometer Caliper	Outside, 0-25 mm, 0.01 mm accuracy	6	C	
77	Micrometer Caliper	Outside, 25-50 mm, 0.01 mm accuracy	6	A	
78	Micrometer Caliper	Outside, 50-75 mm, 0.01 mm accuracy	6	A	
79	Micrometer Caliper	Outside, 75-100 mm, 0.01 mm accuracy	6	C	
80	Micrometer Caliper	Outside, 100-125 mm accuracy	6	C	
81	Micrometer	Inside complete with micrometer screw, interchangeable spindles and handle in carrying box, metric, 0.01 mm accuracy	6	C	
82	Gauge, Cylinder Dial	With handle and extra spindle, metric, 0.01 mm, accuracy, in wooden carrying box.	6	C	
83	Caliper, Vernier	Inside-outside combination, 200 mm capacity, double scales, 0.01 mm and 0.001 inch accuracy, with lock screw and movable jaws	6	C	
84	Indicator, Dial	For measuring warpage, run-out of flywheel, or out of roundness of journals and pins with standard attachments in carrying case, accuracy 0.01 mm	6	C	
85	Vernier Micrometer	Outside, 25-50 mm, 0.005 mm accuracy	3	A	
86	Vernier Micrometer	Outside, 50-75 mm, 0.005 mm accuracy	3	A	
87	Vernier Micrometer	Outside, 75-100 mm, 0.005 mm accuracy			
88	Tester, Caster-Camber	Magnetic in carrying box	6	B	
89	Films	8 mm Instructional Films about Automotive - Servicing, Theoretical, Different subject with sound	10	A	
90	Slide Films	Color slides about different subjects on topics in Automotive	10	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
91	Manuals, Service	1974-1978 model for Japanese Made Vehicles (Toyota, Mitsubishi, Nissan, Mazda)	40	A	
92	Manuals, Service	1974-1978 model for Japanese made Diesel Engine, Driven Vehicles (Isuzu, Fuso, Mitsubishi, Hino, Toyota, Nissan)	40	A	
93	Training Charts	Charts with different vehicles with accompanying training aids	1	A	
<u>BASIC HANDTOOLS</u>					
94	Hammer, Wood	Mallet with wooden handle 0.5 kg	3	D	
95	Hammer, Copper	With wooden handle, 450 g	3	D	
96	Hammer, Machinist	Ball Peen with wooden handle, 450 g	3	D	
97	Hammer, Machinist	Ball Peen with wooden handle, 675 g	3	D	
98	Hammer, Shaft Face Rubber Mallet	With wooden handle, 450 g	2	D	
99	Hammer, Sledge	Forged hardened with wooden handle, 3 kg	2	D	
100	Pliers, Mechanical	Combination slip joint, forged tool steel 20 cm	6	D	
101	Pliers, Diagonal Cutter	Mechanics pliers forged steel, 17.5 cm	6	D	
102	Pliers Bent Nose	Forge tool steel 12.5 cm	6	D	
103	Pliers	Cutter and stripper spring tempered cutting blade, with adjustment for different sizes of electrical wire	6	D	
104	Pliers	Snap ring, tool steel 17.5 cm	6	D	
105	Pliers, Channel Lock Jaw	Forged steel 20 cm	6	D	
106	Punch	Drive Pin, 20 cm, tool steel set - 8 pcs./set (1/6" dia. to 5/16" drive)	2	D	
107	Punch, Center	Forged alloy steel, 10 cm	10	D	
108	Punch, Gasket	Forged steel 4 pcs./set (dia. - 1/8", 1/4", 3/16", 1/2")	4	D	
109	Rivet Set	Hand type, 4 pcs./set (Rivet Dia. - 1/8", 3/32", 1/4", 3/16")	6	D	
110	Chisel	Cold forged steel 4 pcs./set (Length - 12 cm, 15 cm, 17 cm, 20 cm)	4	D	
111	Chisel	Capc, forged steel, 3 pcs./set (Length - 17 cm, 20 cm)	3	D	
112	Chisel	Diamond point, forged steel 2 pcs./set (Length - 17 cm, 20 cm)	2	D	
113	File	Flat, double cut, fine, 250 mm	10	D	
114	File	Half round, double cut, fine, 250 mm	10	D	
115	File	Triangular, double cut, medium, 250 mm	10	D	
116	File	Round, double cut, medium, 250 mm	10	D	
117	File	Flat, fine double cut, 152 mm	10	D	
118	Wrench, Adjustable	Forged steel, max. jaw opening, 11 mm	6	D	
119	Wrench, Adjustable	Forged steel, max. jaw opening, 35 mm	6	D	
120	Wrench, Adjustable	Forged steel, max. jaw opening, 54 mm	6	D	
121	Wrench, Monkey	Forged steel, capacity: 6-13 mm dia. of pipe	2	D	
122	Wrench, Monkey	Forged steel, capacity: 10-32 mm dia. of pipe	2	D	
123	Wrench, Monkey	Forged steel, capacity: 50-95 mm dia. of pipe	2	D	
124	Wrench, Torque	Capacity range: 0 to 1,300 cm/kg	6	D	
125	Wrench, Torque	Capacity range: 0 - 1,900 cm/kg	6	D	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
126	Wrench, Open End	Chrome-molly alloy steel set, 8 pcs./set (mm) 8 x 31, 10 x 11, 12 x 13, 14 x 15, 16 x 17, 18 x 19 x 20 x 21, 22 x 24 mm	6	D	
127	Wrench, Box End	Chrome-molly alloy steel set, 8 pcs./set (mm) 8 x 3, 10 x 11, 12 x 13, 14 x 15, 16 x 17, 18 x 19, 20 x 21, 22 x 24	6	D	
128	Wrench, Socket	1/2" drive, chrome alloy steel set of 10 pcs. complete with 1 universal handle, 1 sliding handle, 2- extension, 1-ratchet handle and enclosed in steel case	6	D	
129	Engine, Dynamometer	With Engine adapters to couple to a generator, with attache ment for fuel consumption meters, cooling system and exhaust pipe, capable of testing engines rated up to 130 HP	1	A	
130	Press, Hydraulic	Capacity 50 tons	1	D	
131	Fire Extinguishers	CO ₂ type	8	D	
132	Drill, Electric	Portable, heavy duty, 1/2" chuck, 220V, 60 Hz	2	C	
133	Drill, Electric	Portable, light duty, 3/8" chuck, 220V, 60 Hz	2	C	
134	Grinder, Bench, Electric	220 V, 60 Hz, 6" diameter, wheel and wire brush attach- ment	2	C	
135	Grinder, Brake shoe	220V, 60 Hz, with adapters to fit different sizes of spindles	2	B	
136	Tester, Wheel Alignment Set	Includes: One - toe-in-bar; two - turn tables; two - magnetic gauge.	2	C	
137	Gauge, Tire Pressure	Capacity, 0-60 lbs.	8	D	
138	Screwdriver	152 mm, carbon steel blade, wooden handle	8	D	
139	Screwdriver	254 mm, carbon steel, 5/16" dia., wooden handle	8	D	
140	Screwdriver	152 mm, carbon steel blade, plastic molded handle	8	D	
141	Screwdriver, Offset	At both ends, forged steel, set 172 mm to 19 mm	8	D	
142	Screwdriver	Phillips head, alloy steel, 4 pcs./set	10	D	
143	Screw Extractor	Easy-out, deep fluted blade, hardened tool steel 6 pcs./ set	6	D	
144	Rule, Steel	305 mm x 25 mm, stainless steel tempered, metric graduations	8	D	
145	Hacksaw	Adjustable frame, pistol grip handle	8	D	
146	Piston Ring Com- pressor	H.D. steel band, capacity 2 1/2" to 4" piston diameter	4	D	
147	Piston Ring Expander	Spring steel strap type, hand grip	4	D	
148	Rule	Steel tape, length 20 m	2	D	
149	Files, Oixen, Blade	Vxigen, blade attachments	8	D	
150	Wrench, Hub	4 pcs./set to fit common 4 wheel drive spindles	2	D	
151	Valve Lifter	For OHV Engine, Pinion Rack type Range 30 to 120 mm	4	D	
152	Puller, Wheel	Three arms, attachment, adjustable positions	2	D	
153	Puller, Brake Drum	Two arms attachment	2	D	
154	Puller, Impact Driver Type	Two arms attachment	2	D	
155		Korek body frame repair system	1	A	
156		Infrared rays stand	1	A	

7. STATIONARY AND MARINE ENGINE

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
1	Steam Power Unit	Complete with economizer, superheater, feed-water tank and pump, pre-heater and accessories, burns diesel fuel commercial grade for school laboratory instruction capable of running a 10 kVA steam turbine generator.	1	A	
2	Diesel Engine	Instructional set on a bedplate coupled to a dynamometer, 30 bhp at 3,000 rpm with instruments and fuel tank in a free standing cabinet, has automatic starting mechanism for easy starting by students has tappings for comprehensive temperature and pressure measurement provided. Following range of tests may be performed: Thermal and mechanical efficiencies Power at various temperature Power at various speeds Fuel consumption and specific fuel consumption	2	A	
3	Gasoline Engine	Instruction set on a bedplate coupled to a dynamometer, 30 bhp at 3,000 rpm battery started, complete with instruments for school laboratory tests and tappings for pressure and temperature, vacuum measurement provided.	2	A	
4	Hydraulic Governor Test Rig	A closed loop rig for complete study of a speed sensitive governor of the oil hydraulic type incorporating all the adjustments required to ensure speed sensitivity and stability, bench mounted, self-contained 3-phase 220 VAC, 60 cycles, 2 kW.	1	C	
5	Fuel Injection Calibration and Testing Equipment	Complete with standard accessories, and adaptors for popular makes of fuel injection pumps and nozzles.	1	A	
6	Electric Starter	Motor and Alternator/Generator Analyzer mounted on a bench with heavy duty casters, complete with standard accessories.	1	B	
7	Gasoline Engine Analyzer	Tune Up Equipment mounted in a bench with heavy duty caster wheels, complete with standard accessories.	1	B	
8	DC Ammeter	Range 1/3/10/30 amps, portable, shock resistant, moving coil type complete with carrying case.	5	B	
9	DC Voltmeter	Range 30/100/300/1,000 volts, moving coil type, complete with carrying case.	5	B	
10	AC Ammeters	Vibration and shock resistant, range 10/20/50/100A complete with carrying case.	5	B	
11	AC Voltmeters	Range 30/75/150/300/750 V complete with case	5	B	
12	Wattmeters	3-phase, portable, current 5/25 A, voltage 120/240 V power factor 1.0 complete with external current and potential transformer and standard accessories.	5	B	
13	Power Factor Meter	Range 5/25 A volts range 60-300 V complete with external current and potential transformer for higher ranges, and standard accessories.	2	B	
14	Frequency Meter	Range 20-100 Hz, 120/240 volts complete with standard accessories and carrying case.	2	B	
15	Battery Testing Voltmeter	Band suspension movement, range minus 3 to zero to plus 3 volts, complete with standard accessories.	2	B	
16	Line Current Testers	Range with current transformer supplied 20/50/100/150/200/300 A complete with carrying case.	4	B	
17	Diesel Engine for Disassembly	Assembly and testing, 4-cycle, battery-started, 3 or 4 cylinders, naturally aspirated engine.	1	A	
18	Diesel Engine for Disassembly	Assembly and testing, 2-cycle, battery started, 3 or 4 cylinders.	1	A	
19	Supercharger for disassembly	Assembly and testing, shop laboratory model Turbo-charger for disassembly, assembly and testing, shop laboratory model Injection pump, kerk type, for 4-cylinder engine for disassembly, assembly, calibration and testing Injection pump, high pressure distributor type for disassembly, assembly, calibration and testing Pressure-time injection pump for disassembly, assembly, calibration and testing.	1	B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
20	Injector Nozzle	Pintle type for disassembly, assembly, calibration and testing Injector Nozzle, hole type for disassembly, assembly, calibration and testing.	2	A	
21	Torque Converter	For disassembly, assembly and testing.	2	C	
22	Reciprocating Pump For Disassembly	Assembly and testing Rotary pump, gear type for disassembly, assembly and testing Centrifugal pump for disassembly, assembly and testing Axial flow pump for disassembly, assembly and testing Test rig for observing performance characteristics of above pump.	1	B	
23	Turbo-Charger	Model (B) cut-away Model of Diesel Turbocharger	1	B	
24	Fuel Pump and Nozzle Cut-Away Model (E)		1	B	
25	Pipe Wrenches 24"		2	B	
26	Pipe Wrenches 12"		2	B	
27	Chain Pipe Wrench		2	B	
28	Pipe Vise		2	B	
29	Pipe Cutter		2	B	
30	Spray Nozzle Cleaning Kit		1	B	
31	Open-End Wrench (MM) 10 mm to 25 mm		1	B	
32	Box Wrench, 10mm-25mm		1	B	
33	Electric Drill	Portable 1/4 chuck capacity	1	B	
34	Electric Drill Press		1	B	
35	Drill Bit		1	B	
36	Fuller assortment on Wall Storage Panel		1	B	
37	Hydraulic Puncher/ Set of Cutter	Model: FTR-607, Max. Hole Dia. (MM) 22φ Max. Plate Thickness (mm) 13 Max. Reach (mm) 70 Method of actuation, switch on puncher Standard of assortment - 14-175, 20.5-22 Weight 18 kgs Made Japan	1	B	
38	Diesel Injection Pump	(Diesel KIKI) w/governor (Pneumatic A77 A CHED) for instruction	5	B	
39	Outside Micrometer (MM)	25.4 mm - 120 mm	1	B	

8. ELECTRICAL

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
1	Oscilloscope	<p>TYPE BP-2505B, "Ando Electric Co., Ltd." Frequency Bandwidth : DC 69.60 Mhz (more than 20 mV/cm) Sensitivity: 1mV/cm (DC to 25 MHz, single trace) Rise Time : 6 ns (more than 20 mV/cm) Time Base : 10 ns/cm to 12.5 s/cm Sweep Delay Time Range: 1 ns to 50s CRT Display Area: 6 x 10 cm Power Requirements: AC 110/220V, 50/60 Hz Dimensions (Approx.): 325 (H) x 230 (W) x 450 (D) mm Weight (Approx.): 18 kg with Operation/Instruction Manuals</p>	6	B	
2	IC Testers	<p>"Ando Electric Co., Ltd.," TYPE 41c-10 IC Tester ICS tested : Operational Amplifier ICs and compara- tor ICs Test Items : DC Tests (Icc, Ieo, Vio, Iio, IB, Av, CMR, etc.) AC Tests (SR, ts, BW, Vom, NL, etc.) Option : Type THC-12 Heating equipment (for tem- perature characteristic Testing) with Operation/Instruction Manuals</p>	6	A	
3	Earth Resistance Tester	<p>Fuso Electric Co., Ltd. Model F-351, range : 0-1/100/1,000 Ohms, complete with auxiliary grounding rods and test lead wires and other accessories. With Operation/Instruction Manuals</p>	4	C	
4	Electronic Voltmeter Calibrator	<p>Kikusui Electronics Corporation Model 102B complete with accessories DC Output : Polarity +DCV & -DCV Voltage Range : From 0.075 mV to 550V (±5%) are obtained with combination of the knobs on the panel. Output Resistance .. approx. 0-8.3 Kohm (varied by output voltage) AC Output (RMS & p-p): Waveform ... sine-wave 400HZ (±2%) or 1 kHz Voltage Range and Output Impedance .. Same as DC Output Dimensions : 445W x 215H x 440D mm Net weight : 16.5 kg approx. With Operation/Instruction Manuals</p>	6	A	
5	Direct Reading Capa- citor Meter	<p>Kuwano Electrical Instruments Model MC-112A Measuring Range: 0-50/200/500/1,000/2,000 nF Accuracy : ±3% of scale length Measuring Fre- quency : 120 Hz Measuring Range: About 0.5V r.m.s. Power Supply : AC 220V, 50/60 Hz, 6VA Dimensions : 260 x 170 x 250 mm Weight : 5 kg Complete with accessories With Operation/Instruction Manuals</p>	6	A	
6	Auto Earth Tester	<p>Misahi Electrical Instruments Works Ltd. Type ET-5 Measuring Range Earth Resistance: 0-10-100-1,000 ohm Voltmeter : AC 0-15-150-300 volt Allowable Error Earth resistance: 0-2 ohm ±0.1 ohm meter 2-20 ohm ±0.5 ohm 20-200 ohm ±5 ohm 200-1,000 ohm ±50 ohm Voltmeter : Full range 2.5% Complete with auxiliary grounding rods, test lead wires and other accessories. With Operation/Instruction Manuals.</p>	6	C	
7	Portable DC Volt- Ammeter	<p>Shimadzu Electric Type MPM-2, Accuracy : ±0.5% 17 range type : 7 voltage ranges (50 mV-1,000V) and 10 current range (1mA-30A) With Operation/Instruction Manuals</p>	6	C	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
8	Portable AC Volt-Ammeter	Shimadzu Electric Type SPM-2, Accuracy : 0.5% 15 range type : 5 voltage ranges (3-300) and 10 current ranges (1mA-30A) With Operation/Instruction Manuals	6	C	
9	Handy Digital Tachometer	One Sokki Co., Ltd. Model HT-400 Detection System : Reflection system Detecting Interval: 50 to 150 mm Light source : LED Sensor : Phototransistor Measurement: Measuring Range : 100 to 10,000 rpm Display : Red LED, Seven Segments Digit : 4 digits Time Base : Crystal Oscillator Repetition interval : 1 sec. Accuracy : ±1 rpm in a range of 100 to 7,000 rpm ±3 rpm in a range of 7,000 to 10,000 rpm Power : Built-in 6V, battery Working Temperature: 0 to 45°C Weight : 640 g NOTE: Complete with reflection tape and instruction manual	6	B	
10	Insulation Resistance Tester	Fuso Electric Co., Ltd. Model F-206F : Hand Operated generator type Rated voltage : 100/250/500 volts Rated Resistance : 20/50/100 M ohm NOTE: Complete with test lead wires and instruction manual	2	B	
11	Insulation Resistance Tester	Fuso Electric Co., Ltd. Model 535F : Battery-operated type Rated voltage : 250/500/1,000V Rated Resistance : 50/100/2,000 M ohm NOTE: Complete test lead wires, lead wire with push button switch and instruction manual	2	B	
12	Multitester	Hioki Electric Works Ltd. Model 3003 Ranges : DC Voltage: 0.25 - 1kV w/6 ranges; Sensitivity: 30K-ohms/volt, accuracy: 3% DC Amperage: 50 mA-10A w/5 ranges Voltage drop: 250 mV; Accuracy: 3% AC Voltage: 10-1kV w/4 ranges; Sensitivity: 13.5 K ohm/volt, accuracy: 3% AC Amperage: 10A; w/one (1) range; accuracy: 3% Ohm : 5M maximum; 4 ranges Battery used: 1.5V x 2 NOTE: Complete with test lead wires and instruction manual	6	A	
13	Magnetic Amplification Circuit Trainer	Type MA-55 "Ando Brand" Used to study the motion of a magnetic amplifier. Various typical amplification circuits can be constructed on the panel board. Exercises: Measurements of B-H curve; experiments of the low equal ampereturns, and the relation between current gains of feedback amplifiers, etc.	6	A	
14	Digital Circuit Trainers	Types DL-1S "Ando Brand" Used to study the principle of logic circuits. Exercises: experiments of: the functions of logical components; the application of Boolean Algebra to logic circuits; circuits, such as code conversion, shift register, counter, addition, complement, comparison, etc.; operation, such as addition, subtraction and multiplication.	6	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
15	Pulse Circuit Trainer	"Ando Brand" Used to study the principle of pulse circuits and understand the relation between circuit parameters and pulse waveforms. Exercises: Experiments of: differential circuit, integrating circuit, Schmitt trigger circuit, a stable multivibrator circuit, monostable multivibrator circuit, AND circuit, OR circuit and other pulse circuits.	6	A	
16	Transistor Circuit Trainer	POWER SUPPLY CIRCUIT-TRAINER; AND ELECTRICAL WAVES FILTER CIRCUIT-TRAINER "Ando Brand"	6	A	
17	Digital HI Tester	3201 (Hioki Electric Works Ltd.) Measuring range: DC V: 0.1 mV 1,000V; AC V: 0.1 mV 1,000V; DC A: 0.1 μ A 200 mA; AC A: 0.1 μ A 200 mA; OHM: 1 Ω -200 Ω Accuracy: 0.3% rdg. \pm 0.1% f.s. \pm 1 dgt. in DC 2,000 mV range 0.3% rdg. \pm 0.2% f.s. \pm 1 dgt. in AC 2,000 mV range 0.5% rdg. \pm 0.1% f.s. \pm 1 dgt. in OHM 20 Ω range Input Impedance : 5 M const. (AC, DC) Operating Principle: Integrating type Maximum Indication : 1999 (except DC/AC 1,000V) Range Selection : Semi-Auto Range Response Time : DC, Ω approx. 0.5 sec. AC approx. 2 secs. Sample Rate : approx. 2 times/sec. Allowable Ambient Temperature : 0 to 40°C (32 to 104°F) Operating Humidity : Less than 85% (relative humidity) Temperature Coefficient : DC 2,000 mV 20K Range : 150 ppm/°C of full scale AC 2,000 mV AC; DC 2,000 μ A 200 ppm/°C of full scale Power Consumption : approx. 0.3 watt Power Supply : UN-3x4 or 6V DC; AC adaptor Dielectric Voltage : AC 1,500V DC for one minute between input terminal and outer case Dimensions, Weight : Approx. 151 H x 100 W x 55 D mm. approx. 470g	6	B	
18	Digital Clamp HI-Tester	3202 (Hioki Electric Works, Ltd.) Measuring Range : *In case of normal operation AC A : 0.1 - 1,000 A AC V : 0.1 - 1,000 V DC V : 0.14 Ω - 1,000 V OHM : 0.1 - 1 k Ω *In case of peak hold operation AC A : 1 - 100 A AC V : 1 Ω - 1,000 V DC V : 1.4 - 1,000 V Accuracy : \pm 2% f.s. \pm 1 dgt. in case of normal operation \pm 4% f.s. \pm 1 dgt. in case of peak hold operation Display : Liquid Display Crystal Max. Indication : 999 (3 Fall digits) Response Time : DC, AC approx. 1.0 sec. (Rise Time) 7-8 sec (Fall Time) OHM approx. 1.0 sec Sample Rate : approx. 2 times/sec Power Supply : UN-3x4 Power consumption : approx. 10 mW Battery Life : Better than 100 hours of continuous use (with alkaline battery) Dielectric Voltage : AC 1.5 FV for one minute between input terminal and other case	4	B	
19	Clamp Tester	3101 (Hioki Electric Works, Ltd.) Measuring range : AC Volt: 0-150/300/600V AC amp.: 0-6/15/60/150/300A Resistance : 0-1 K ohm Other features : Self-shielding core magnet taunt brand; meter lock; complete with test lead wires, instruction manual and other accessories.	4	B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
20	Oscilloscope	SS-4121A (DC-100 MHz Dual-Trace) Iwatsu Electric Co. Features : 9.5 kg portability 1mV/div. at both channels (DC-20MHz) 8x10 div. 20 kV CRT 20ns/div. ±20% horizontal sweep Delayed and mixed sweep FULL AUTO triggering Variable sweep length Vertical Deflection: *Sensitivity : 5mV/div.-5V/div. (with x1 GAIN) 1mV/div.-1V/div. (with x5 GAIN) *Bandwidth : DC-100MHz, -3 db (with x1 GAIN) DC-20MHz, -3 db (with x5 GAIN) *Rise Time : 5.5 ns, *Input RC : 1M ±2%/16pF Horizontal Deflection: *Sweep Time 20ns/div.-0.5s/div., *Sweep Magnifier : x10, CRT *Display Area : 8 div. x 10 div. (1 div. = 8mm) *Accelerating voltage : approx. 20kV, Weight: 10kg, *Dimensions : 275 mmW x mmH x 363 mmL	6	B	
21	Oil Voltage Withstand Test Set	Type IP-5005 (Musashi Electrical Instruments Works, Ltd.) Power requirements : AC 110/220V, 60 Hz Output Voltage : AC 0-50,000V (between both poles) AC 0-25,000V (at side to earth) Accessories : Oilcup (micrometer 1 set) cord connection and instruction manual.	6	A	
22	Capacitance Meter	Model MC-112A (Kuwans Electrical Instruments Co., Ltd.) Measuring Range : 50/200/500/1,000/2,000 nF Accuracy : ±3% of f.s. Display : Meter Dimensions : 170(W) x 260(H) x 250(D) mm Weight : 7 kg NOTE: Complete with test lead wires, instruction manuals in accessories.	6	B	
23	Universal Bridge	Type YHBR-2A (Yamabishi Electric Co., Ltd.) Measuring Range : Resistance : 0.1 ohm - 1Mohm Inductance : 10µH - 100H Capacity : 10 PF - 100nF Accuracy : Below ±0.5% at ohm - 100 K ohm Below ±0.5% at 1mH - 10H Below ±0.5% at 0.001 nF - 10nF NOTE: Complete with connection lead wires, instruction manual and other accessories.	6	C	
24	Voltage & Current Standard	Model SV-201A (Kuwano Electrical Instruments Co., Ltd.) Measuring Range : Voltage: 25V/10V/1V/100mV/10mV Current: 1A/100mA/10mA/1mA/100µA/10µA Output : 0-26.12V/12.112V/ 1.2112V/121.12mV/ 12.112mV Current: 0-1.2112mA/121.12µA/ 12.112mA/1.2112mA/ 121.12µA/12.112µA Resolution : Voltage: 5mV/0.15mV/50µV/5µV/ 0.5µV Current: 50µA/-5µA/0.5µA/50µA/ 5µA/0.5µA NOTE: Complete with connecting and test lead wires, instruction manual and other accessories.	6	B	
25	Portable Standard Watthour Meter	Types IP-20 (Tokyo Shibaura Electric Co., Ltd.) Single-phase No. of element : 1 Voltage : 120-240V Current : 1-5-10-20-30A Frequency : 60 Hz Rev/kWh (at 100V, 5A top) : 2000-2400-2500-3000	6	B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
25 (cont'd)	Portable Standard Watthour Meter	Dimensions in mm : 185 x 190 x 220 Weight in kg : 6.5 NOTE: Complete with instruction manual and accessories	6	B	
26	Portable Standard Watthour Meter	Type VP-20 (Tokyo Shibaura Electric Co., Ltd.) Three Phase No. of element : 2 Voltage : 120-240V Current : 1-5-10-20-30A Frequency : 60 Hz Rev/kWh (at 100V, 5A tap) : 1000-1200-1250-1500 Dimensions : 185 x 250 x 220 mm Weight : 10.5 kg NOTE: Complete with instruction manual and accessories	6	C	
27	Standard Type Thermometer	Model HP-4F (Anriton Meter Co., Ltd.) Indicator accuracy : ±1% of full scale Case Dimensions : 280 x 210 x 110 mm Weight : 2.1 kg Ranges : 10-150°C / -40-500°C Thermocouple: CRC Code: 18432 Range : 0-500°C NOTE: Complete with connecting test lead wires, instruction manual and other accessories	6	A	
28	Transducer For Power Use	Model TR-A, TR-W, TR-UP, TR-F (Takenotor Electrical Instrument Co., Ltd.) Complete with connecting lead wires, instruction manual and other accessories.	6	A	
29	Generator	Shunt, 4-pole, 10kW maximum generated voltage from 0-220 volts-60 Hz open type	6	A	
30	Generator	Series, 4-pole, 10kW maximum generated voltage from 0-220 volts-60Hz open type	6	A	
31	Motor	Shunt, 4-pole, 10kW 220 volts-60Hz open type	8	A	
32	Motor	Series, 4-pole, 10kW 220 volts-60Hz open type	6	A	
33	Generator	Compound, 4-pole, 10kW 220 generated voltage 60Hz open type	4	A	
34	Servo-Mechanism Trainer	220V, 60 cycles with torque transmitter, receiver and differential transmitter.	6	A	
35	Diesel Engine Alternator Electric Plant	4-cylinder, 3-phase, 15kW, 20/240 volts, 60Hz	6	A	
36	Transformer	Start 3φ, 220/110, 25/50 amperes.	8	A	
37	Transformer	Star/Delta 3-phase, 220/110, 25/50 amp.	8	A	
38	Transformer	Star/Delta 3-phase, 220/110, 25/50 amp.	8	A	
39	Turvo-Alternator	8kW, 220V, 60Hz, 3,000 rpm DC motor driven with shaft-mounted exciter and tachogenerator complete with control and synchronizing panel, enclosed type.	2	A	
40	Digital Frequency Meter		6	A	
41	Power Factor Phase Angle Meter	Portable type, high sensitivity moving coil type indicator with taut band suspension. Designed for laboratories, research rooms, schools production lines, etc. For measurement in single phase circuits and three phase, balance or unbalanced circuits. Features electronics techniques, phase angle sensing transducer method. Made of durable quality materials.	2		1.a b c d e

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
41 (cont'd)	Power Factor Phase Angle Meter	<p>2.a. Effective power factor measuring Range: Lead 0.5-1.0-0.5 lag</p> <p>b. Scale: Power factor, lead 0.3-1.0-0.3 lag phase angle; lead 90°-0°-90° lag</p> <p>c. Rated accuracy ... ±3% expressed as phase angle.</p> <p>d. Frequency influence ... within ±1.5° in phase angle at 45 to 65 Hz.</p> <p>e. With microred meter to eliminate parallax.</p> <p>f. Scale length ----- 130 mm (5 1/8")</p> <p>3.a. Operation, maintenance, service and application manual in English.</p> <p>b. Instrument test data and characteristics.</p>	2		
42	30 Wattmeter	<p>1.a. Wattmeter shall be electro-dynamometer portable type.</p> <p>b. Shock-proof, robust, taut band suspension system movement.</p> <p>c. Designed for use in the field, test rooms, laboratories and educational institutions.</p> <p>d. Wide current ranges of 1:5 ratio, selectable by terminal connection method.</p> <p>e. With minimum self-heating.</p> <p>f. In black molded case of phenol resin.</p> <p>2.a. Current ranges ----- 1/5 amperes</p> <p>b. Voltage ranges ----- 240 volts</p> <p>c. Scale ----- 600 W or 1,200 W</p> <p>d. Accuracy ----- ±0.5% of full scale value</p> <p>e. Scale length ----- Approx. 130 mm (5 1/8")</p> <p>3.a. Terminal leads</p> <p>b. Operation, maintenance, service and application manual in English</p> <p>c. Instrument test data and characteristics.</p>	2	A	
43	DC Dynamometer	<p>1.a. Dynamometer shall be a prony-brake unit.</p> <p>b. Capable of operation with the units of the motor generator sets.</p> <p>c. It shall provide facility for performing mechanical and torque tests for standard motors.</p> <p>d. Provided with a base for mounting motor frame sizes.</p> <p>e. Made of durable quality materials.</p> <p>2.a. Power output ----- 220V, AC 150 watts maximum</p> <p>b. Torque scale ----- 0-35 lbf-in or higher</p> <p>3.a. Spare belts, pulley, scale and adapters.</p> <p>b. Instructions, service, maintenance, and application manual in English.</p> <p>c. Equipment test data and characteristics.</p>	3	B	
44	LCR Bridge	<p>Generator : Internal : 1 kHz ±2% Internal DC supply, 6V, 60 mA maximum</p> <p>Detector : Internal detector response flat or selected at 1 kHz sensitivity control provided</p> <p>DC polarization : Capacitor can be biased to 600V from external DC power supply for series capacitance measurements</p> <p>Power requirement: 4 size D cells, supply or 220V, 60 Hz ±10%</p> <p>All component parts shall be of durable quality materials</p> <p>Null detector : center zero, 50 µA Galvano meter</p>	2	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
44 (cont'd)	LCR Bridge	Range measurement: Capacitance --- 1 pF to 100µF or better Inductance ---- 1 micro henry to 1,100H or better 47 ranges Accuracy ----- ±2.0% on all range or better Test jig Equipment data and characteristic instruction, service, application manual in English.	2	A	
45	Foot Candle Meter	1.a. Taut band suspension system moving coil type indicator and a light sensitive selenium photo-voltaic cell. b. Designed for determining the best lighting illumination condition in factories, office, stores, hospital, schools, street and residences. c. Measures illumination from any angle. d. Free from friction error and protects against shock and vibrations. e. Power supply ----- photovoltaic cell f. Instrument shall be made of durable quality methods. 2.a. Rating ----- 0-150 ff candle b. Accuracy ----- ±5% of full valve c. Indicator ----- Taut band suspension moving coil type, provided with knife-edge pointer fitted with an antiparallax mirror d. Output voltage --- 0-10 mV e. Output resistance- Approx. 4k-ohm f. Photoelectric cell Selenium photo cell with color filter and cosine convection filter 3.a. Carrying case. b. Operation, maintenance, service and application manual in English. c. Instrument test data and characteristics.	2	A	
46	Plain Paper Copier	220V, 60 Hz for reproduction of laboratory exercise.	2	A	
47	AC Network Analyzer	YEW type com-25 all transistorized complete with accessories; teaching manual for instructors and students.	1	A	
48	Analog Computer	YEW type 3306 with 72 units maximum of computing elements complete with accessories and teaching manual	1	A	
49	Portable Generator	AC Yanmar brand type YPG15A 60Hz, 15 kVA, 12kW, 220V including prime mover	1	A	
50	Multi-Pen Recorder	YOKOGANA, type 3061, 220-240 Power source, 60 Hz	2	A	
51	Overhead Projector	Complete with acetate roll attachment and one acetate roll, dust cover 3 spare lamps and 500 transformers and frames, 220V AC, single phase 60 Hz.	1	A	
52	Motor Controller Trainer	Solid-state motor controller for both AC & DC face plate provided with mimic diagram. Power input 220V AC 60 Hz ±10%. Includes control buttons, forward-reverse contractors, overload 3-pole isolated circuit breakers; variable circuit, logic elements multi-vibrator indicator lamp and complete with test data and characteristics operation, service and maintenance manuals. Complete accessories, student's and instructor's manual.	10	A	
53	Digital Voltmeter	220 ±10%, 60 Hz, 50 MW to 1,000 V, response time 0.4 second.	8	B	
54	Digital Ohmmeter	220V, ±10%, 60 Hz, 50 ohm to 20 m.ohm (6 to 8 ranges)	8	B	
55	Digital Measuring Instruments	The plug in units on follows. Basic Units be of 220V, 6- Hz (a) Digital DC voltmeter DC 300 MW - 1,000 ranges Basic units be of 220V, 60 Hz	8	B	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
55 (cont'd)	Digital Measuring Instruments	Basic Units be of 220V, 60 Hz (b) Digital DC voltmeter DC 3M-1,000 V ranges (c) Digital DC voltmeter percent meter 0-500% (d) Digital ohmmeter 500 ohm-50 m.ohm ranges (e) Digital resistance percent meter 0-300% (f) Digital AC voltmeter Ac. 3-300V (g) Digital DC/AC wattmeter 150V, 5A	8	B	
56	Slide-Sound Projector	Carrying case containing one 35mm slide projector with standard lens and synchronized cassette recorder capable of recording instructional commentary for pre-selected slide programmes complete with microphone and standard equipment. Instructions and operating manual in English. Additional Equipment;	1	A	
57	Spare Lamps	For Slide Projector	3	A	
58	Slide Magazine	For 50 slides	30	A	
59	Cassettes	C90	50	A	
60	Lens for Classroom Projection	Suitable for an electrical supply of V.A.C., single-phase, ----- Hz	1	A	
61	Projection Screen	Portable, approx. size 1,180 x 1,180 mm; supplied complete with tripod	1	A	
62	Cassette Player	For standard cassettes; heavy duty; simple operation suitable for student use; complete with cordless earphones and magnetic winding for inductive transmission.	2	A	
63	Slide Viewer	For 24 x 36 mm slides; heavy duty; simple operation type complete with 2 spare bulbs.	2	A	
64	Transparency Maker	Photocopier, supplied complete with the ff materials (a) Spirit stencil masters 216 x 280 mm (b) Ink stencil masters 216 x 280 mm (c) Photocopy sheets 216 x 280 mm (d) Transparency sheets red on clear (e) Transparency sheet black on clear (f) Transparency sheet green on clear (g) Transparency sheet blue on clear Spare lamps, belts, etc. for three years operation; suitable for an electrical supply of ... V.A.C., single-phase, ... Hz Instruction and maintenance manual in English.	1 100 100 500 100 100 100	A	
64	Basic Electricity Trainer	a. Bread board system with solderless connector b. Shall consist of standard components. c. Shall include the following general groups of components: 1. Resistors 2. Inductors 3. Capacitors 4. Meters d. The component/group of components should facilitate performance of the following laboratory experiments: - Resistor color code and use of the ohmmeter - Connection and reading basic electric meters. - Linear resistance and volt-ampere curves - Non-linear resistance and dynamic resistance - Series connection of linear elements - Series circuit of composed of linear and non-linear elements - Source resistance and thevenin's theorem - Power dissipation in series circuits. - Efficiency and maximum power transfer - Parallel connection of linear resistance - Series parallel connection of linear elements - Conductance in series and parallel - Measurements discrepancies in simple meter circuits - Analysis and reduction of measuring errors - The effect of temperature on resistance	3	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
64 (cont'd)	Basic Electricity Trainer	<ul style="list-style-type: none"> - Magnetic field - Magnetization curve of an iron core - Kirchoff's law and closed loops - Delta-wye transformation (Resistance network) 	3	A	
66	Decade Capacitance Box	<p>1.a. Ideal for use in laboratory and test Shops.</p> <p>b. It shall be made of durable quality materials</p> <p>c. Mounting shall be lab-bench cabinet.</p> <p>d. Terminals shall be of four building post with grounding link provided on the panel.</p> <p>e. Instrument shall feature a low loss, leakage dielectric absorption.</p> <p>2.a. Capacitance - 50 pf to 1.1115 of in steps of 100PF with 0 to 100 Pf, variable air capacitor with divisions of 1 Pf.</p> <p>b. Min. capacitance - 50 Pf with all control set at zero</p> <p>c. Dielectric - polystyrene for decade steps.</p> <p>d. Accuracy - $\pm(0.5\%+5)$ at 1 kHz for total capacitance including 50 Pf min. for the 3-terminal connection.</p> <p>e. Temperature coefficient - 140 ppm/°C (nominal)</p> <p>f. Frequency characteristic - DC cap/1-kHz cap less than 1.001</p> <p>g. Max. operating temperature - 65°C</p> <p>h. Dielectric absorption (voltage recovery) - 0.1% max.</p> <p>i. Dissipation factor - 150 to 1,000 Pf, 0.001 max. at 1 kHz; over 1,000 Pf, 0.0002, max. at 1 kHz</p> <p>j. Insulation resistance - 10^{12} ohms, min.</p> <p>k. Max. voltage - 500 V peak up to 30 kHz.</p>	3	A	
67	Decade Resistance Box	<p>1.a. Designed for laboratory measurement, testing and development work.</p> <p>b. Instrument shall contain five step decade of resistance.</p> <p>c. Resistors shall be of low-temperature-coefficient</p> <p>d. It shall be made of durable quality materials</p> <p>2.a. Overall accuracy : $\pm(0.05\% + 5 \text{ Megohm})$</p> <p>b. Incremental accuracy : $\pm 3.0\%$</p> <p>c. Zero resistance : Approx. 3 Megohms per dial.</p> <p>d. Max. current : 1 amp.</p> <p>e. Total resistance of decade : 1 ohm</p> <p>f. Resistance per step : 0.0 ohm</p> <p>g. Total resistance : 11,111 ohm</p> <p>h. Number of decades : 5</p> <p>i. Temperature coefficient: Less than ± 10 ppm/°C at room temp.</p> <p>j. Switches shall be multiplate, solid-silver-alloy.</p> <p>k. Terminal shall be jack-top binding posts on standard 3/4-in spacing.</p> <p>3. Accessories:</p> <p>a. To be provided with shield terminal.</p> <p>b. Equipment test data and characteristics.</p> <p>c. Operation and service manual in English (2 each)</p>	3	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
68	Instrument Current Transformer Description	<p>1. a. Core shall be of high permeability hypersil.</p> <p>b. Unit shall function into a 5-ampere meter movements.</p> <p>c. Unit shall have a maximum circuit voltage of 3,450 V.</p> <p>d. Designed for extending the scope of usefulness of laboratory portable instruments.</p> <p>2. a. Primary rating ---- 10/15/30/50/100/250,300/500/ (Typical, but not 750/1,500A necessary as described)</p> <p>b. Secondary rating --- 5 A</p> <p>c. Rated Burden ----- 15 VA</p> <p>d. Maximum circuit voltage--- 3,450 V</p> <p>e. Accuracy ----- ±0.2% of rated value</p> <p>3. a. Surable carrying case</p> <p>b. Instruction, service and application manual in English.</p> <p>c. Equipment test data and characteristics.</p>	2	A	
69	Auto-Transformer	<p>1. a. Specially designed to utilize core area and multiple wire sizes, to simulate larger units used by industry.</p> <p>b. Electrically and physically matched to the system</p> <p>c. It shall be provided with all the necessary and proper taps used in reduced voltage starter circuits.</p> <p>d. It shall be made of durable quality materials.</p> <p>2. a. Input</p> <p>b. Output 104/170/135/144/220V/240V, 60Hz Single phase</p> <p>3. a. Equipment test data and characteristics</p> <p>b. spare fuse</p> <p>c. Instruction service application manual in English.</p>	3	A	
70	Instrument Potential Transformer	<p>1. General:</p> <p>a. Core shall be high permeability hypersil.</p> <p>b. Design for extending the scope of usefulness of laboratory portable instrument.</p> <p>c. Made of durable quality materials.</p> <p>2. Specific:</p> <p>a. Primary rating----- 440/600V (Typical) 1.2/2.4/3.6 kV or better</p> <p>b. Secondary rating ----- 110/220 V</p> <p>c. Rated Burden ----- 15 VA</p> <p>d. Accuracy ----- ±0.2% of rated value</p> <p>3. Accessories:</p> <p>a. Durable carrying case</p> <p>b. Instruction, service and application manual in English.</p> <p>c. Equipment test data and characteristics.</p>	3	A	
71	Direction R.F Watt-meter W/Dummy Load	<p>1. a. Instrument shall include A 50 ohm coaxial (non-inductive) load resistor.</p> <p>b. It shall have a watt-meter scale graduation of 125 watt and/or 250 watts full-scale.</p> <p>c. The dummy load shall have a rated capacity of 200-250 watts continuous.</p> <p>d. Instrument panel shall be smooth, non-corrosive finish.</p> <p>2. a. Frequency range ----- 1.8 to 30 MHz</p> <p>b. Wattmeter range ----- 0-100 and/or 0-250 watts</p>	2	C	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
71 (cont'd)	Direction R.F watt- meter W/Dummy Load	c. Wattmeter accuracy ----- +5% of full scale reading, or better d. Dummy load power ----- 100 or 200 watts continuous, 500-1,000 1000 watt max. e. Insertion VSWR ----- Less than 1.05 VSWR upto 1,000 MHz f. Load type ----- Non-inductive (coaxial resistor) g. Load Impedance ----- 50 ohms nominal h. Connectors ----- UHF type or BNC type 3.a. Operation, service and application manual in English. b. Equipment data and characteristics. c. Adaptor for BNC connector	2	C	
72	Synchronizing Gene- rator Parallel Opera- tion System		1	A	
73	DC, AC Universal M-G Training System		1	A	
74	Amplidyne type Ampli- fication generator training system		1	A	
75	Ward-Leonard Training System		1	A	
76	M-G Automatic Control System		1	A	
77	Transmission Line Training System		3	A	
78	Variable Power Factor Load System		4	A	
79	LCR Load for Testing		4	A	
80	Relay Sequence Train- ing System		2	B	
81	Sequence Control Training System	For lift control	2	A	
82	Sequence Control Training System	Universal type	2	A	
83	Capacitor Training System		4	A	
84	Sequence Control Training System		2	A	
85	Semi-Conductor Logic Training System		4	A	
86	TV Training System		2	A	
87	Color TV Training System		2	A	
88	Logic Circuit Train- ing System		2	A	
89	Whinstone Brige for Training		4	B	
90	Field Back Control Training System		4	A	
91	μ V-Meter for Training		4	B	
92	Resistance Training System		4	A	
93	Syncro Servo Training System		2	A	

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
94	Variable Dial Con- denser		2	A	
95	Standard Nica Con- denser		1	A	
96	Variable Air Con- denser		1	A	
97	Color Camera	SONY Tricon, NTSC standard 120V AC 60 Hz	DXC-1210	2	A
98	Tripod	Heavy Duty with dolly	SAMSON	2	A
99	Camera Cable	18P-18P plug, 100 meters	CCY	2	A
100	Intercommunication Headset		DR-10A	3	A
101	Video Camera	SONY Monochrome, EIA standard 120V, AC 60 H. (For superimposition)	AVC-32600X	1	A
102	Videocassette Recorder/Player	3/4" SONY U-MATIC, NTSC standard with com- plete electronic editing facility	VO-2860	3	A
103	Automatic Editing Control Unit	SONY	RM-430	1	A
104	Special Effects Generator	SONY, NTSC standard 120V AC, 60 Hz	SEG-1210	1	A
105	Multi-Signal Gene- rator	SONY, NTSC standard 120V AC, 60 Hz	MD-1210	1	A
106	Audio-Video Distri- butor	120V AC, 60 Hz	DA-200		
107	Color Sync Generator	SONY	CG-101	1	A
108	Color Picture Monitor	SONY	PVM-5300	1	A
109	Monochrome Picture Monitor	SONY 9" size	PVM-90E	1	A
110	Color Picture Monitor	SONY (Preview & Program use rack mount 12" size) 120V AC 60 Hz	PVM-1211	1	A
111	Color-Receiver/ Monitor	SONY with tuner, NTSC standard 120V AC, 60 Hz	CVH-1250	2	A
112	Filmchain Multiplex	SONY with two inputs	VCR-2	1	A
113	Color Camera For Filmchain Use	SONY Tricon, NTSC standard 120V AC 60 Hz	DXC-1650	1	A
114	16mm Television Pro- jector	EIA standard	SC-105-EIA	1	A
115	35mm Slide Projector	KODAK Ektagraphic 120V AC 60 Hz	AF-2	1	A
116	Remote Control Box For Television Pro- jector		RENOCOM	1	A
117	Projection Lamp For Television Projector		SC-LAMP	12	A
118	Exciter Lamp For Television Projector		EX-LAMP	12	A
119	Stereo Power Amplifier	SONY 50W	TA-F5A	1	A
120	Stereo Tape Recorder	SONY two-track two-channel, 220V AC 60 Hz	TC-707S	1	A
121	Audio Microphone Mixer	SONY, 8-channel inputs 110V AC 60 Hz	MX-20	1	A
122	Dynamic Microphone	SONY Professional low impedance	R-660	3	A
123	Table Stand For Microphone		A-12N	3	A
124	Microphone Boom Stand		B-301	2	A

ITEM	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY	PRIORITY	REMARK
125	Cradle Suspension For Microphone	CRS-3P	2	A	
126	Parabolic Reflector	PBR-330	1	A	
127	Condenser Microphone	Shot-gun type C-76	1	A	
128	Condenser Microphone	Lavalier type low impedance ECM-50PS	2	A	
129	Microphone Holder	For Shot-gun microphone GP-3	1	A	
130	AC Power Supply	For ECM-50PS AC-148F	3	A	
131	Speaker	SONY two-way SS-G5	2	A	
132	Portable Stereo Cassette Tape Recorder/Player	Four track, 2-channel TC510-2	1	A	
133	Videocassette Recorder/Player	SONY Portable U-Matic 3/4", AC/DC operation V0-3800	1	A	
134	TV Camera	SONY Portable Triniton, NTSC standard AC/DC operation DXC-1610	1	A	
135	External Sync And Adaptor	CMA-6	1	A	
136	Battery	Spare rechargeable, 12V BP-60	6	A	
137	Battery	Spare rechargeable, 12V BP-20A	6	A	
138	Battery Charger	BC-1000	1	A	
139	Camera Brace For Camera	VCT-1	1	A	
140	Color Video Monitor	Portable for field use, AC/DC operation PVM-8000	1	A	
141	Rechargeable Battery Pack	BP-30B	3	A	
142	Camera Cable	10P-10P plug, 153 meters	1	A	
143	Video Cassette Tape	60 minutes running time KCA-60	60	A	
144	Portable Lighting Set	Complete with stand and carrying case CAT-KIT-220	2	A	
145	Lamp	For CAT-KIT-220, 800W 220V B8-32	2	A	
146	Portable Dimmer	220V AC 60 Hz DSP-3022-6	1	A	
147	Broad Light	LQB-20	4	A	
148	Focusing Light	LQF-6	6	A	
149	Spot Light	LQS-10	4	A	
150	Horizon Light	UHQ-10	4	A	
151	King Light	LQK-5	2	A	
152	Stand For King Light	SSRS	2	A	
153	Lamp	800W 220V B25-32F	3	A	
154	Time Base Corrector	SONY, NTSC BVF-1000	1	A	
155	Color Television Receiver	SONY 21" KV-2142R	20	A	
156	RF Amplifier		2	A	
157	RF Modulator	Channel 6 and 5	2	A	
158	Video Projection System	SONY XP-7200/ VPS-7200	1	A	
159	Coaxial Cable	For installation of studio	1	A	
160	FM Stereo Transmitter	Power output of 1 kW max.	1	A	
161	AM Transmitter	Power output of 1 kW max.	1	A	