DRAFT SYLLABUS FOR THE TRADE OF SPINNING TECHNICIAN (SEMESTER PATTERN) UNDER CRAFTSMEN TRAINING SCHEME (CTS)

General Information

1. Name of the trade	: Spinning Technician
2. N C O Code No.	:
3. Duration	: Two Years (Four semesters)
4. Power Norms	: 19 KW
5. Space Norms	: 525 sq. mtr.
6. Entry Qualification	: Passed 10th class examination under 10+2 system of Education with Science and Mathematics or its equivalent.
7. Unit Size (No. of Student)	: 16
8a. Instructor's/Trainer's Qualification	: Degree in Textile Technology /Spinning Technology with one year experience in relevant field. OR Diploma in Textile Technology with two year Experience in the relevant field. OR NTC/NAC in the trade with three years experience in the relevant field.
8b. Desirable qualification	: Preference will be given to a candidate with Craft Instructor Certificate (CIC).

Note: At least one Instructor must have Degree/Diploma in relevant field.

Draft Syllabus for the Trade of "SPINNING TECHNICIAN" Under C.T.S.

First Semester: (Duration**: Six Months)**

Week No.	Trade Practical	Trade Theory
1.	**FITTING:** Filing Practice	Trade instruction-safety-types of safety-workshop safety- Hand Tools safety-personal safety. Hand tools-Types of hand tools- Types of tools used, Vices-specification-uses, care and maintenance.
2.	Filing to size and chipping	Accident-Prevention-machine men- Industry - Marking tools-calipers- Dividers-Surface plates-Angle plates-Scribers-punches- Surface gauges-Types-Uses, Care & maintenance
3.	Marking and Punching, Hack sawing	Cutting tools-Files-Chisels- Hacksaw blades-Scrapper- Various cutting angles and their uses-care & maintenance specification of steels flats & strips-specification steel flats & strips-specification of steel angles - Specification of steel sections.
4.	Checking of different surfaces Open fitting of sized metals	Measuring tools-Precision and non-precision-steel rule calipers- Vernier caliper-micrometer-Vernier Height gauge-depth gauge types-uses and specification-calibration and setting as per standard.
5.	Scrapping to rough and size	Measurement of angles-Vernier Bevel protractor- Graduation on universal Bevel protractor- Reading of universal Bevel Protractor.

Week No.	Trade Practical	Trade Theory
6.	Internal Fitting. Drilling & Fitting	Drilling machine types-Drill chuck-specification Drill types – reamer types-various cutting angles-tapes and dies-types - uses-tap drills and dies calculation
7.	Grinding practice	Grinding m/c practice types method of drill bit and chisel grinding.
8.	Snap gauge filing	Gauges-types-Uses-care & maintenance-tolerance-limits - fits-definitions & applications.
9.	TURNING: Tool grinding tool setting & job setting	Lathe-types-construction-parts - functions-specification. Lathe accessories.
10.	Facing and chamfering, plain turning	Different types of operations performed in lathe
11.	Different types of shoulder and small radius turning	Cutting tools materials-types selection-various cutting angles-uses and applications
12.	Taper turning and simple thread forming	Types of threads-application tapping and dyeing process metrics and inch threads. Different process of taper Turning & calculation
13.	WELDING: Welding practice Straight-line bead square butt Joint single "V" Butt joint	Welding types-Arc Welding- Gas Welding-Welding tools and equipments Types of welding joints-Electrode and current selection-Specifications and safety precautions
14.	Welding practice: Using gas welding	Types of gases used in gas welding oxy acetylene flame setting Gas pressure and nozzle selection. Edge preparation for Arc & Gas Welding process.
15.	CARPENTRY:	Carpentry hand tools-

Week No.	Trade Practical	Trade Theory
	Simple planning. Sawing and chiseling.	Measuring tools-Work holding devices- Bench vice. Work Bench - Clamps types-sizes - uses-safety methods saws-Plan types- setting Sharpening- Uses etc.
16.	Simple mortise and Ten on joints practice	Different types of saws-Saw setting-Types of joints- Application –wood working machine-specification and their uses. Adhesives type and uses.
17.	ELECTRICAL: Demonstration and identification of cables. Soldering practice-Series- Parallel connection Measurement of electrical energy- Multi-meter,	Atom & Atomic structure electrons- Fundamental terms, work, power, energy units voltage- current, resistance colour codes. Types of cables-standard wire Gauge-Ohm's law-Kirchoff s law.
18.	Demonstration & practice on fixing common electrical accessories. Testing of domestic appliances-Building layout assemble of small electrical circuits.	Series and parallel connection-Simple problems properties of conductor, semi conductor and insulator. Primary and secondary cells common electrical accessories and their specification. Demonstration and description of domestic appliances.
19.	Constructional of calling bell (Electromagnet) Testing. Rewinding of electromagnet identification of DC generator. Use of Ohmmeter and merger.	Magnetism and Electro magnetism-simple-Motors generators- Principles and rules applied.
20.	Demonstration and Reading of Electrical Measuring Instruments.	Explanation of electrical measuring instruments - Ammeter-Voltmeter- Wattmeter-Energy meter.
21&22	ELECTRONICS: Testing of active & passive component with suitable meters like Ammeter, Voltmeter & Multimeter-Testing of DC & AC	Electronic Activities-Passive components- Resistors- Capacitors-inductors-coils- Transformers-Relays- Applications and Uses. All PN diodes Transistor IC's, simple and logic gates. Application and uses.
23-24	Assembly and testing of simple	Simple rectifiers, power supply, amplifier-logic

Week No.	Trade Practical	Trade Theory
	electronic circuits (power supply) Testing of amplifier	gates-Principle of operations
25	**Project work / Industrial visit(optional)** **Project brief should be given beforehand during Industry visit and project work related to the trade, involving Industrial Engg. Work like Time study, work study, motion study, method study, etc.**	
26	**Examination**	

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Second Semester: (Duration**: Six Months)**

Week no	**Trade Practical**	***Trade Theory***
1	Familiarization to Textile Machines-Industrial Visit to Spinning units.	**Orientation to Textile Sector:** Overview of Textile Industry-History, Scope & Future Prospects, Strengths & Weakness of the industry.
2	Collection of various fibres samples and methods of identification	**Orientation to Fibers:** Definition of Textile Fiber. Classification of fibers w.r.t. Origin-natural, synthetic and regenerated types.
3	Sketching of various parts of ginning machine, maintenance of ginning, speed and setting parameters of ginning.	**Ginning:** Introduction to Ginning, Objectives of Ginning - types of ginning, types machines in ginning, setting parameters & process control in ginning. Blending & Mixing – Types & Equipments.
4	Sketching of various gears, bevels, belts, bearings & Various Tool-kits, Belt and rope driver: speed ratio, limiting ratio of tensions. Centrifugal tension condition for maximum power transmission and speed.	**Blow room:** Objectives of Blow room process – Principle of Opening and Cleaning - Opening and cleaning machines: Hopper Bale Breaker, Hopper feeder, Step cleaner, Axiflow cleaner, Mono cylinder, ERM cleaner, Porcupine opener, 3 bladed beaters, Kirschner beater, Salient features of Mixers and bale plucker
5	Maintenance schedule of the Blow room Machineries. Setting of various parts of the opening roller, cleaning roller and speed checkup. Cleaning check up of the machine parts with general checklist	Maintenance schedule of the Blow room machineries. Setting of various parts of the opening roller, cleaning roller and speed checkup.
6	Tachometer, tools kits, leaf gauge, allen key, inner and outer caliber. Motor pulley,	Motor pulley, machine pulley fitting, and belt alignments of various machines. Greasing of

Week no	Trade Practical	*Trade Theory*
	machines pulley fitting and belt alignment of various machines. Compressor and air pressure checkup	bearing, types of greases. Greasing techniques to various bearings in the Blow room machinery
7&8	Line diagram of bye pass arrangement, two-way distributor, air pressure setting, valve alignment, photocell setting. Function and maintenance of cage, condenser, grid bars, metal detector, limit switches and Photocell alignment in mixing machines	Auxiliary blow room machines: Cages, pneumatic conveyors, condenser, distributors, dust extractor, Automatic Waste Evacuation System (AWES), rotary filters, cellar less blow room, filter bags, contaminator eliminator, metal detectors & Fire Diverters. Function of Two-way distributor, Bye-pass arrangement of material flow.
9 & 10	Maintenance of piano feed regulating motion, rack motion, length measuring motion, pressure check-up.	Function of piano feed regulating motion, rack motion, length measuring motion and pressure check up, air pressure requirement of various parts of the Blow room
11	Maintenance of PIV gears, top & bottom cone drum, greasing, oiling of various parts of the Scutcher. Profile design of and construction of top and bottom cone drum	Function of PIV gears, drives analysis to various parts of the Scutcher. Mechanical understanding of top & bottom cone drum setting, Belt alignment. Study of automatic scutcher – auto doffing unit – Defects in blow room laps, causes and remedial measures.
12	Parts of induction motor, synchronize motor, function of stop motion switches in Blow room. Study of electrical panel in Blow room.	Function of Synchronize motor, induct, motor. Door Stop motion switches. Various places of door stop motion switches in Blow room.
13 & 14	Check up of various parts of the machines with standard setting. Maintenance of chute feed line	Trouble shooting problems in Blow room. Lap c.v% control technique, One meter lap c.v%, Chute feed system; Introduction to Chute feed

Week no	Trade Practical	*Trade Theory*
		system, Maintenance of chute feed systems: flock feeder, flock meter. Duct setting,. Function of photocell in chute feed
15 & 16	Manufacturers of carding machine, various models, Passage of material through carding machine. Various parts of the carding machine. Wire specification for processing cotton, synthetic and blends. Heel and toe mechanism. Waste control. Effect of licker in, cylinder, flat and doffer speed on web quality.	**<u>Carding Department:</u>** Introduction to carding, Objects and Principles of Carding. Functions of carding machines, Passage of material through carding machine. Wire specification for processing cotton, synthetic and blends. Heel and toe mechanism. Waste control. Effect of lick cylinder, flat and doffer speed on web quality.
17&18	Maintenance schedule of the carding department. Motor plate alignment and setting. Motor pulley and machine pulley alignment, flat belt setting.	Maintenance schedule of the carding department. Motor plate alignment and setting. Motor pulley and machine pulley alignment, flat belt setting. Overhauling of coiler mechanism
19&20	Checklist of General cleaning of the card. Setting of various parts of the machine. Leaf gauge, Allen key, and toolbox.	General cleaning of carding machine, Gearing diagram, speed particulars and technical data, greasing & oiling parts.
21 & 22	Wire mounting: Cylinder, doffer, licker in and flat strip. Wire specification details. Machine leveling checkup.	Wire mounting: Cylinder, doffer, licker in and flat strip. Wire specification details. Machine leveling checkup.
23	Overhauling of coiler mechanism, Selection of card clothing for	Salient features on new generation cards, feed zone-integrated feed

Week no	Trade Practical	*Trade Theory*
	cotton, synthetic, blends. Auto leveler functions, setting and maintenance. Selection of card clothing for cotton, synthetic blends.	plate, senso feed, unifeed, precarding, segment, carding zone, integrated grinding system, flat measuring system. Automation in cards. Study of Apron Web doffing device. Brief study of auto leveler. Dust extraction system in card - Automatic Waste Evacuation System (AWES).
24	Half setting, Full setting, Grinding operation, stripping operation. Flat grinding, under casing setting & polishing. Web doffing unit servicing coiler unit servicing. Change gears: Draft, production, tension, coiler, production change gears. Analysis of machine speed & setting wire point	Half setting, Full setting, Grinding operation, stripping operation. Stationary flat change. Flat grinding, under casing setting & polishing Change gears: Draft, production, tensions, coiler and can changer. Trouble sheeting techniques: Control of neps generation, flat stripping waste, licker in dropping, and cylinder dropping.
25	**Project work / Industrial visit(optional)** **Project brief should be given beforehand during Industry visit and project work related to the trade, involving Industrial Engg. Work like Time study, work study, motion study, method study, causes and remedial measures of defects, etc.**	
26	**Examination**	

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Third Semester: (Duration**: Six Months)**

Week No.	Trade Practical	Trade Theory
1&2	Introduction to comber preparatory machines and comber, Function of various parts of the comber machines. Passage of a comber preparatory machines and comber machine.	**Comber Department:** Introduction to comber preparatory machines and comber. Objects of Combing. Degree of Combing. Function of various parts of the comber machines. Material passage of comber preparatory machines: Sliver lap, ribbon lap and super lap machines. Combing Cycle. Comber timing diagram, comber draw box.
3 & 4	Checklist during general cleaning. Head stock overhauling, Draft gear overhauling. Coiler mechanism overhauling, re-needling of half comb. Inching motion, index wheel setting, cost buffing techniques, detaching roller setting & buffing.	Maintenance schedule of the comber preparatory machines and comber. General cleaning of a comber. Head stock overhauling, Draft gear overhauling. Coiler mechanism overhauling , re needling of half comb. Inching motion, index wheel setting, cots buffing techniques, detaching roller setting & buffing.
5&6	Trouble sheeting: Piecing index setting, noil level setting: head to heat, Overall machine. Unicom, draw box drafting auto motion in comber.	Trouble shooting: Piecing index setting, noil level setting: head to heat, Overall machine. Salient features of new generation, preparatory machines and combers.
7 & 8	Functions of various parts, material passage. Gearing diagram of the machine.	**Draw frame:** Introduction to Draw frame, Objects of Drawing. Functions of various parts, material passage. Gearing diagram of the machine. Machine speed particulars.
9&10	Headstock overhauling, draft gear overhauling, timer belt checkup,	Maintenance schedule of the Draw frame & General cleaning.

	coiler mechanism overhauling, stop motion, clearer, roller setting, pneumafil fan suction & net checkup.	Headstock timer belt checkup, coiler mechanism overhauling, stop motion, clearer, roller setting, pneumafil fan suction & net checkup.
11 & 12	Function of draft change gear, break draft change gear, tension draft change gear. Top roller pressure checking, cots buffing. Setting of auto levelers.	Function of draft change gear, break draft change gear, tension draft change gear. Top roller pressure checking, cots buffing. Automation in Draw frame. Brief study of drating irregularities. Sliver defects in draw frame,their causes and remedies.
13&14	Function of various parts of the simplex machine, material passage, stop motion switches, motor plate alignment, setting of belts, cots buffing, inching motion, creel guide roller checkup & oiling, photo sensor setting	**Simplex:** Introduction to simplex, Objects of Speed frame, function of various parts of the machine, passage of material, stop motion switches, motor plate alignment, setting of belt cots buffing, inching motion, creel guide roller checkup & oiling, photo sensor settings
15	Maintenance schedule of the simplex machine. Headstock overhauling, draft gear overhauling, draft roller setting, top arm pressure gauge & saddle gauge, needle bearing greasing. Flyers, spindles, builder motion, differential motions, cone drums, process Parameter.	Maintenance schedule of the simplex machine. Headstock overhauling, draft gear overhauling, draft roller setting, top arm pressure gauge & saddle gauge, needle bearing greasing.

16	Bobbin rail leveling, differential box oiling & noise check up, builder motion overhauling flyer alignment, false twister types, spacer & condenser, creel drafting systems, suspended flyers, differential and builder mechanisms.	Bobbin rail leveling, differential box oiling & noise check up, builder motion overhauling flyer alignment, false twister types, spacer & condenser. Defects in speed frame process, causes and remedies. Salient features of new generation speed frames. Automation in Speed frames.
17&18	Function of various parts of the machine. Maintenance schedule of the Ring frame . Headstock overhauling , draft gear overhauling, spindle gauge (centering). Ring rail leveling, drafting roller setting, bottom roller, top roller, top arm pressure gauge & saddle gauge. Spindle: Inserts, Bolsters. Highspeed spindles. Spindles drives.	**<u>Ring frame:</u>** Introduction to Ring frame, Objects of Ring frame, function of various parts of the machine. Design of roller stand, bobbin holder, top rollers ball bearings, needle bearings, cots, aprons and spacer's specifications, drafting system, Lappet, balloon control rings, separator, Ring rail movement, builder motions, Ring and Travelers, profile matching, High speed travelers.
19&20	Checklist for General cleaning of the machine, Needle bearing greasing, lappet Gauge, tin roller bearing checkup & change. Machine leveling, change gear replacement: draft, twist, ratchet, break draft change gear. Creel alignment (bobbin holder setting), top roller buffing, idle spindle rectification work. Over head cleaner, auto doffing, dual drive motor.	General clearing of the machine. Needle bearing greasing, lappet gauge, tin roller bearing checkup & change. Gear replacement draft, twist, ratchet, break draft change gear. Creel alignment (bobbin holder setting), top roller buffing, idle spindle rectification work. General study of ring frame gearing end -off end, gears, spur gears, helical gear bearings.

21&23	Spindle oil replenishing, greasing of top roller & jockey pulley, traveler clearer setting, traveler change, and Jockey setting. Design of Ring frame builder motion cam. Hi-speed rings and spindles travelers. Auto doffing, improved driving systems, Automation in ring frame.	Spindle oil replenishing, greasing of top roller & jockey pulley, traveler clearer setting, traveler change, and Jockey pulley setting. Common defects in ring spun yarns, causes and remedies. Causes of end breakages in ring frame.
24	Introduction of various Spinning Systems For diversified products.	Salient features of new generation ring frame. Creel, drafting systems, apron specifications & automatic doffing systems. Study of Compact Spinning System.
25	**Project work / Industrial visit(optional)** **Project brief should be given beforehand during Industry visit and project work related to the trade, involving Industrial Engg. Work like Time study, work study, motion study, method study, causes and remedial measures of defects, product development, etc.**	
26	**Examination**	

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Fourth Semester: (Duration**: Six Months)**

Week No.	Trade Practical	Trade Theory
1 & 2	Models of various winding machines. Function of various parts of the machine. Maintenance schedule of the winding machine.	**Winding:**Introduction to winding, function of various parts of the machine, yarnclearing system & its setting. Maintenance schedule of the winding machine
3&4	General cleaning, individual motor plate alignment, belt check up, drum pulley alignment, setting of cop holder, rotary magazine setting and checkup.	General cleaning, individual motor plate alignment, belt check up, drum pulley alignment, setting of cop holder, rotary magazine setting and checkup.
5&6	Splicer: mechanical setting and air adjustment. Knife blade setting, balloon breaker setting. Cone holder setting, package dia setting gauge, length measuring motion setup	**Splicer:** Mechanical setting and air adjustment. Knife blade setting, balloon breaker setting. Cone holder setting, package dia setting gauge, length measuring motion setup
7&8	Overhead clearer check up, speed adjustment, rail track check up. Mechanical setting of individual drive to all parts of the machine: slab catcher, winding drum, splicer setting, EYC checking, yarn guide groove formation checking	Overhead clearer check up, speed adjustment, rail track check up. Mechanical setting of individual drive to all parts of the machine: slab catcher, winding drum, splicer setting, EYC checking, yarn guide groove formation checking
9,10 & 11	**Maintenance of spinning machinery:** Routine and Preventive Maintenance. Maintenance Program. Procedure of Maintenance. Equipment history records, inventory control, preventive maintenance checklist, machinery audit check	**Maintenance of spinning machinery:** Routine and Preventive Maintenance. Maintenance Program. Procedure of Maintenance. Equipment history records, inventory control, preventive maintenance checklist, machinery audit check points.

Week No.	Trade Practical	Trade Theory
	points. Application of mechanic tools, machinery erection, modernization..	
12&13	Maintenance activities in rotor spinning machine. Functions of feed roll, rotor box, rotor, opening roller, feed roller, navel, stop motion, traverse guide, auto doff and auto piece etc., driving system suction and filter unit-basic settings- machine speed particulars and technical data-cleaning schedule and maintenance schedule.	Modern Spinning Technology Rotor Spinning (OE): Introduction: Rotor spinning, material passage. Wire specifying opening roller for cotton, synthetic and blends, Rotor design, navel design, take-up and package from mechanism. Drive mechanism: Feeding. Opening roller, rotor, take-up and yarn traversing.
14&15	----------	Airject Spinning: Introduction to Air jet spinning, working of various parts of the machine: creel, drafting system, twisting mechanism, winding. Working of air jet nozzle and setting of nozzle with other parts, air pressure adjustment. Yarn traverse setting, winding package hardness, change places of various areas in air jet spinning control panel setting.
16&17	----------	DREF Spinning: Introduction to Dref spinning, function of various parts of the machines: creel, drafting system, twisting mechanism, winding. Working of drum with parts, yarn withdrawal

Week No.	Trade Practical	Trade Theory
		adjustment
18&19	Head stock overhauling, traverse motion, winding drum, twisting assembly, spindle oiling and tension adjustment. Function of change gears: Twist change gear, production change gear, and traverse change gear and tension adjustment.	Two For One twister (TFO): Introduction to two for one twister, functions of various parts-machine speed set up & technical data-cleaning schedule and maintenance schedule.
20&21	Introduction to ring doublers, types, creel, roller arrangement, rings, spindles, travelers, packages, and builder motions. Maintenance of machine: overhauling of headstock, spindle oiling, ring centering, ring rail leveling.	Ring Doublers: Introduction to ring doublers, types, creel, roller arrangement, rings, spindles, travelers, packages, and builder motions> Maintenance of machine: overhauling of headstock spindle oiling, ring centering, ring rail leveling.
22	Study of Working of 7 Lea motion. Study of doffing mechanism.	**Reeling:** Objects of Reeling. Study of Working of 7 Lea motion. Study of doffing mechanism. **Bundling:** Objects of Bundling and baling. Need of bundling weight correction and its importance. Packing and its types.
23	Familiarization to QA Systems: Visit to Companies which have ISO 9000 certification	Quality Assurance: Concepts of quality, Control and Assurance. Introduction to ISO 9001, 2000, ISO 14000 and SA 8000, OHSAS 18001 systems, 5S Practices.
24	Testing of different yarn quality. Count, Twist and Single yarn Strength.	Concept of yarn quality. Testing of different yarn quality. Count, Twist and Single yarn Strength. Study of yarn irregularities.
25	**Revision** **Revision of courses should be done judiciously after taking feedback from the participants through feedback form/Questionnaire, the important topics to be dealt with**	
26	**Examination**	

TRADE : SPINNING TECHNICIAN
LIST OF TOOLS AND EQUIPMENT

A. TRAINEES TOOL KIT FOR 16 TRAINEES + 1 INSTRUCTOR

Sl. No.	Name and Description of the Item	Quantity
1	Combination Plier 200 mm insulated	17 Nos.
2	Screw Driver 200 mm	17 Nos.
3	Screw Driver 100 mm	17 Nos.
4	Terminal Screw Driver	17 Nos.
5	Hammer Ball Pein (0.25 kg)	17 Nos.
6	Try Square (200 mm)	17 Nos.
7	File round (half) 2nd cut 250 mm	17 Nos.
8	File round 150 mm	17 Nos.
9	Plumb Bob 115 gm.	17 Nos.
10	Bar wood Mallet 1 kg (75 mm x 150 mm)	17 Nos.
11	Knife	17 Nos.
12	Wood rasp file 250 mm	17 Nos.
13	Firmer chisel 12 mm	17 Nos.
14	Firmer chis3el 6mm	17 Nos.
15	Neon Tester	17 Nos.
16	Tenon saw 250 mm	17 Nos.
17	File flat 25 cm. 2nd cut	17 Nos.
18	File flat 25 cm. Smooth	17 Nos.
19	Steel Rule 300mm to read Metric	17 Nos.
20	Test lamp	17 Nos.
21	Circlip Opener	17 Nos.
22	Continuity Tester	17 Nos.
23	Glouse	17 Nos.
24	Insulating Tape	17 Nos.
25	Electrical Soldering Iron	17 Nos.

B. List of Shop General Outfit

Sl. No.	Name and Description of the Item	Quantity
1	Pliers side cutting 200 mm	6 Nos.
2	Pliers flat nose 150 mm	6 Nos.
3	Pliers round nose	6 Nos.
4	Pliers long nose	6 Nos.
5	Screw driver heavy duty 250 mm	5 Nos.
6	Screw driver 7 mm x 300 mm square blade	6 Nos.
7	Firmer Chisel 25 mm	6 Nos.
8	Firmer Chisel 10 mm	6 Nos.
9	Marking Gauge	6 Nos.
10	Combination bevel Protractor	2 Nos.
11	Cold Chisel Flat 25 x 200 mm	4 Nos.
12	Cold Chisel flat 18 x 200 mm	4 Nos.

13	Hammer Ball Pein 0.5 kg	5 Nos.
14	Hammer Ball Pein 0.75 kg	5 Nos.
15	Hammer Ball Pein 1 Kg	5 Nos.
16	Hammer Cross Pein 0.5 kg	5 Nos.
17	Wall jumper octagonal 37mmx450mm, 37 mm x 600 mm	2 Nos.
18	Centre punch 100 mm	5 Nos.
19	File Flat 300 mm rough	5 Nos.
20	File Flat 300 mm 2nd cut	5 Nos.
21	File Flat 250 mm Bastard	5 Nos.
22	File flat 250 mm smooth	5 Nos.
23	File half round 300 mm 2nd cut	5 Nos.
24	File triangular 150 mm 2nd cut	4 Nos.
25	Spanner double ended set of 6	5 sets
26	Adjustable Spanner 350 mm	2 sets
27	Foot Print grip 250 mm	2 sets
28	Allen keys (Metric & Inches)	20 sets
29	Steel rule 300 mm	5 Nos.
30	Steel Measuring Tape (2m)	5 Nos.
31	Steel Measuring Tape (20 m)	2 Nos.
32	Hacksaw frame Adjustable 200 mm to 300 mm	5 Nos.
33	Spirit level 300 mm	3 Nos.
34	Bench vice 150 mm	3 Nos.
35	Bench vice 100 mm	2 Nos.
36	Pipe Wrench (300 mm)	10 Nos.
37	Spanner (up to 32 mm)	10 Nos.
38	Vernier Caliper	2 Nos.
39	Ring spanner	3 sets
40	12" grip Plier	4 Nos.
41	Inner caliper	5 Nos.
42	Outer caliper	5 Nos.
43	Box spanner	4 sets
44	Torque spanner	3 Nos.
45	File Swiss type needle set	5 Nos.
46	Shore hardness tester for	1 No.
47	Needle file	3 sets
48	Nylon hammer	5 Nos.
49	Puller 2 arm, 3 arm	3 each
50	Copper tube cutter	3 Nos.
51	Ratchet brace 6 mm capacity	5 Nos.
52	Ratchet bit 4mm and 6 mm	5 Nos.
53	Vernier Caliper 200mm (ordinary)	5 Nos.
54	Snips	5 Nos.
55	Conduit Pipe die set	5 Nos.

C. LIST OF MACHINERY & EQUIPMENT

A. Spinning Machinery (Miniature)

Sl. No.	Name and Description of the Item	Quantity
1	Blow room (Miniature)	1 No.
2	Carding (Miniature)	1 No.
3	Draw frame (Miniature)	1 No.
4	Simplex (Miniature)	1 No.

5	Ring frame	1 No.
6	TFO (Miniature)	1 No.
7	Rotor spinning machine (miniature)	1 No.
8	Winding machine (miniature)- Autoconer	1 No.
9	Classimat/classifault system	1 No.

D. Maintenance Equipments

Sl. No.	Name and Description of the Item	Quantity
1	Machine leveling gauge (Spirit level)	1 No.
2	Greasing pump	1 No.
3	Spindle oil lubricating machine	1 No.
4	Roll trueing machine	1 No.
5	Pressure gauge	1 No.
6	Machine pulley adopter assembly (3arm, 4arm type)	1 No.
7	Cots buffing machine.	1 No.
8	Tachometer	1 No.
9	Tensionometer	1 No.
10	Computer, Printer and accessories including cartridge and paper for Classifault/classimat system	1 No.