SYLLABUS FOR THE TRADE OF

SPINNING TECHNICIAN

UNDER

CRAFTSMEN TRAINING SCHEME

Designed in
2006

GOVERNMENT OF INDIA
MINISTRY OF LABOUR & EMPLOYMENT
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
EN BLOCK, SECTOR V, SALT LAKE CITY
KOLKATA – 700 091

List of Members attended the Trade Committee Meeting held on 18.07.2006 at CSTARI, Kolkata for designing of syllabi for the Trade of 1) Spinning Technician, 2) Weaving Technician, 3) Textile Mechatronics and 4) Textile Wet Processing (Textile Group of Trades) under CTS.

SL.NO.	NAME	DESIGNATION & ORGANISATION	
1.	Shri G.Bhowmik	Director, CSTARI, Kolkata	Chairman
2.	Dr. S.M. Chatterjee	Advisor, Tech. Edu., Govt. of W.B., Kalyani	Member
3.	Dr.A.K.Samanta	Instt. of Jute Technology, Kolkata	Member
4.	Prof. Swapan Kr. Ghosh	Instt. of Jute Technology, Kolkata	Member
5.	Dr. Satyaki Bhattacharyya	Kalyani Govt. Engg. College, Kalyani	Member
6.	Shri T.Sundararaj	Commissioner of Emp.&Trg., Chennai-32	Member
7.	Shri S. Mondal	Dy. Director, ITI Gariahat	Member
8.	Shri S.S.Pal	Kalyani, Spinning Mill	Member
9.	Dr. S.K.Mandal	NITTTR, Kolkata	Member
10.	Shri P.Sengupta	Jaya Shree Textiles, Rishra-712249	Member
11.	Shri Sunanda Mitra	Apparel Export Promotion Council	Member
12.	Shri Amitabha Ray	Kalyani Spinning Mill	Member
13.	Shri T.Mukhopadhyay	Dy. Director Of Trg. CSTARI, Kolkata	Member
14.	Shri A.Chakraborty	Asstt. Director of Trg. CSTARI, Kolkata	Member
15.	Shri R.B.Ram	Asstt. Director of Trg. CSTARI, Kolkata	Member
16.	Shri S.B.Sardar	Training Officer, CSTARI, Kolkata	Member
17.	Shri P.K.Kolay	Training Officer, CSTARI, Kolkata	Member
18.	Shri R.N.Manna	Training Officer, CSTARI, Kolkata	Member

GENERAL INFORMATION

1.	Name of the Trade	:	Spinning Technician
2.	N.C.O. Code No.		
3.	Entry Qualification	:	Passed 10th Class Exam.
4.	Duration of Craftsmen Training	:	2 years
5.	Space requirement	:	525 Sq.Meter

SYLLABUS FOR THE TRADE OF SPINNING TECHNICIAN
Duration - 2 years

Semester –I Duration- 6 Months

Week No.	Practical	Theory	Engineering Drawing	Workshop Calculation & Science
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.	-Methods of drawing & Instruments and equipments used in Engg. Drawing of Plan, Elevation & different views of a m/c.	Fraction Decimals: Basic Arithmetic operations - Addition, Subtraction, Multiplication & Division
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	Types of lines-their meaning, Applications as per IS: 696	Fractions, decimals, Complex problems of basic operations
3.	Marking and Punching, Hacks awing	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.	Simple conventional symbols for material and parts as per IS-66	Properties & Uses of Metals and Non-metals
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.	Construction for geometrical drawings angles and triangles	System of units-British-Metric & S.I. Units for length –are – volume-capacity weight-time – force-temperature-their conversion.

5.	Scrapping to rough and size	Measurement of angles-Vernier Bevel protractor-Graduation on universal Bevel protractor-Reading of universal Bevel Protractor.	Geometrical construction of Rectangle Square Triangle Circle	Principle or corrosion-Corrosive materials and non-corrosive materials causes and remedies.

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	Geometrical construction of polygons and ellipse, parabola and hyperbola.	Inertia-velocity-Acceleration-speed-Equation of motion-Friction –Principles- of friction-related problems.
7.	Grinding practice	Grinding m/c practice types-method of drill bit and chisel grinding.	Geometrical construction of involutes, oval, and helix,. Reviewing the various geometrical constructions.	Concept of scalar and vector quantity with examples. Newton's law s of motion. Law of conservation of momentum –mass-weight-density
8.	Snap gauge filing	Gauges-types-Uses-care & maintenance-tolerance-limits-fits-definitions & applications.	Free hand practice on printing style for standard letters and numbers	Square roots-factorization methods-division method
9.	**TURNING:** Tool grinding-tool setting & job setting	Lathe-types-construction-parts-functions-specification. Lathe accessories	Free hand practice on printing style for standard letters and numbers.	Percentage-changing percentage to decimal, decimal to friction-vice versa-simple problems.
10.	Facing and chamfering, plain turning	Different types of operations-performed in lathe	Free hand sketching of St. lines, rectangles, circles, square, polygons, and ellipse.	Heat treatment of metals-methods of Heat treatment
11.	Different types of shoulder and small radius turning	Cutting tools materials-types-selection-various cutting angles-uses and applications	Free hand sketching of simple geometrical solids cube, prism, cylinder, sphere, pyramids.	Work-power-energy-simple problems.
12.	Taper turning and simple thread forming	Types of threads-application-tapping and dieing process-metrics and inch threads. Different process of taper Turning & calculation	Free hand sketch of measuring tools: Steel rule, Inner caliper, Outer caliper	Different types of force-stress-strains –modulus of elasticity simple problems
13.	**WELDING:** Welding practice Straight-line bead-square butt	Welding types-Arc Welding-Gas Welding-Welding tools and equipments Types of welding joints-Electrode and	Scales construction of plain scale,. Representing fraction.	Algebra power & exponents-Laws of exponents.

	Joint-single "V" Butt joint	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.	Simple dimensioning technique size and location dimension for parts, holes. Angles Taper Screw, etc. as per IS: 696.	Algebraic simplification problems
15.	**CARPENTRY:** Simple planning. Sawing and chiseling.	Carpentry hand tools-Measuring tools-Work holding devices-Bench vice. Work bench-Clamps types-sizes-uses-safety methods saws-Plan types- setting Sharpening-Uses etc.	Simple dimensioning technique size and location dimension for parts, holes. Angles Taper, Screw, etc. as per IS: 696.	Factors and equations: Algebraic formula.
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.	Dimensioning practice: Unidirectional system and Aligned system	Equations: simple, simultaneous, quadratic.
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.	Isometric view of tapered blocks: Single sided and Double sided Center "v" shape.	Application, construction and solution of problems.
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.	Isometric view of simple solids: Cubes	Use of Logarithm and anti-logarithm table. Logarithm and exponent
19.	Constructional of calling bell (Electromagnet) Testing. Rewinding of electromagnet identification of DC generator. Use of Ohmmeter and megger.	Magnetism and Electro magnetism-simple-Motors generators- Principles and rules applied.	Isometric view of simple solids: Various Shapes	Basic operations involving logarithm in the computation.
20.	Demonstration and Reading of Electrical Measuring	Explanation of electrical measuring instruments-Ammeter-Voltmeter-	Isometric view of stepped blocks: Single & Double sided and center.	

	Instruments.	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.	Isometric view of complicated blocks-Combined of Simple tapered and stepped Blocks.	Fundamental geometrical definition angles and properties of angles, triangles, properties of triangles.
23-25.	Assembly and testing of simple electronic circuits (power supply) Testing of amplifier	Simple rectifiers, power supply, amplifier-logic gates-Principle of operations	Isometric view of complicated blocks-Combined of Simple, tapered and stepped Blocks.	Pythagoras theorem, properties of similar triangles.
26	Class Test	Class Test	Class Test	Class Test

Semester-II Duration – 6 Months

27.	**Orientation to Textile Sector:** Overview of Textile Industry-History, Scope & Future Prospects, Strengths & Weakness of the industry.	Familiarization to Textile Machines-Industrial Visit to Spinning units.	Interconvention of isometric, oblique drawings of and vice versa.	Moment of Inertias, Stress, Strain, Work of Rupture.
28.	**Orientation to Fibers:** Definition of Textile Fiber. Classification of fibres w.r.t. Origin-natural, synthetic and regenerated types.	Collection of various fibres samples and methods of identification	Drowsing of sectional view, Longitudinal shapes of fibers	Do.
29-30.	**Ginning:** Introduction to Ginning, types of ginning, types machines in ginning, , setting parameters & process control in ginning.	Sketching of various parts of ginning machine, maintenance of ginning, speed and setting parameters of ginning.	Line diagram of Ginning Plant	Do
31.	**Blow room:** Opening and cleaning machines: Step cleaner, Axiflow cleaner, Mono cylinder, ERM cleaner, Porcupine opener, 3 bladed beaters, Kishner beater, Salient features of Mixer's and bale pluckers	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.	Gearing diagram of various m/cs	Gears: Speed calculations, velocity ratio, Draft change pinion calculation, Draft Constant
32.	Maintenance schedule of the Blow room machineries. Setting of various parts of the opening roller, cleaning roller and speed	Maintenance schedule of the Blow room Machineries. Setting of various parts of the opening roller, cleaning roller and speed		

	check-up.	check-up. Cleaning check up of the machine parts with general checklist.		
33.	Motor pulley, machine pulley fitting, and belt alignment6 of various machines. Greasing of bearing, types of greases. Greasing techniques to various bearings in the Blow room machinery	Tachometer, tools kits, leaf gauge, allen key, inner and outer caliber. Motor pulley, machines pulley fitting and belt alignment of various machines. Compressor and m air pressure checkup.		
34-35.	Auxiliary blow room machines: Cages, condenser, distributors, dust extractor, rotary filters, cellar less blow room, filter bags, contaminator eliminator, metal m detector. Function of Two-way distributor, Bye-pass arrangement of material flow.	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.	Line diagram of modern Blowroom line.	Calculation of beats / inch, Trash%
36-37.	Function of piano fee regulating motion, rack motion, length measuring motion and pressure check up, air pressure requirement of various parts of the Blow room.	Maintenance of piano feed regulating motion, rack motion, length measuring motion, pressure check-up.	Cone drum profile, Link diagram.	Calculation of Piano feed Regulating motion
38.	Function of PIV gears, drives analysis to various parts of the Scutcher. Mechanical understanding of top & bottom cone drum setting, Belt alignment.	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.		
39.	Function of Synchronize motor, induct, motor. Door Stop motion switches. Various places of door stop motion switches in Blow room.	Parts of induction motor, synchronize motor, function of stop motion switches in Blow room. Study of electrical panel in Blow room.		
40-41.	Trouble shooting problems in Blow room. Lap c.v% control technique, One meter lap c.v%, Chute feed system; Introduction to Chute feed system, Maintenance of chute feed systems: flock feeder, flock meter. Duct setting,. Function of photocell in chute feed.	Check up of various parts of the machines with standard setting. Maintenance of chute feed line.		
42-43.	**Carding Department:** Introduction to carding, Functions of carding machines, Passage of material through carding machine. Wire specification for processing cotton, synthetic and blends. Heel	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.	Gearing diagram	Simple calculation of production, draft, change of pinion.

	and toe mechanism. Waste control. Effect of lick cylinder, flat and doffer speed on web quality	Heel and toe mechanism. Waste control. Effect of licker in, cylinder, flat and doffer speed on web quality.		
44-45.	Maintenance schedule of the carding department. Motor plate alignment and setting. Motor pulley and machine pulley alignment, flat belt setting. Overhauling of coiler mechanism.	Maintenance schedule of the carding department. Motor plate alignment and setting. Motor pulley and machine pulley alignment, flat belt setting.		
46-47.	General cleaning of carding machine, Gearing diagram, speed particulars and technical data, greasing & oiling parts.	Checklist of General cleaning of the card. Setting of various parts of the machine. Leaf gauge, Allen key, and toolbox.		
48-49.	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.		
50.	Salient features on new generation cards, feed zone-integrated feed plate, sensofeed, unifeed, precarding, segment, carding zone, integrated grinding system, flat measuring system. Automation in cards.	Overhauling of coiler mechanism, Selection of card clothing for cotton, synthetic, blends. Auto leveler functions, setting and maintenance. Selection of card m clothing for cotton, synthetic blends.	Sketching of Feeler and Leaf gauge. Feeding mechanism.	Surface speed Calculation for various parts of carding Machine. Nep count Norms of carding
51.	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.	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	Wire specifications for cotton, synthetic materials of various parts of Carding Machine. Sketching of Change gear, Draft gear, Production gear, and Tension wheel.	Speed Set up for grinding operation.
52.	Class Test	Class Test	Class Test	Class Test

Semester-III Duration – 6 Months

53-54.	**Comber Department:**	Introduction to comber preparatory machines	Gearing diagram of	Calculation of Nip/min,

	Introduction to comber preparatory machines and comber. Function of various parts of the comber machines. Material passage of comber preparatory machines: Sliver lap, ribbon lap and super lap machines. Comber timing diagram, comber draw box.	and comber, Function of various parts of the comber machines. Passage of a comber preparatory machines and comber machine.	comber	Noil & different drafts, production, etc.
55-56.	Maintenance schedule of the comber preparatory machines and comber. General cleaning of a comber. Head stock overhauling, Draft gear overhauling. Coiler mechanism overhauling , reneedling of half comb. Inching motion, index wheel setting, cots buffing techniques, detaching roller setting & buffing.	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.	Sketches of Unicomb, reneedling of comb. Sun & planet gear, Combing cycle diagram	Calculation of forward & backward feed movement of detaching roller
59-60.	Trouble shooting: Piecing index setting, noil level setting: head to heat, Overall machine. Salient features of new generation, preparatory machines and combers.	Trouble sheeting: Piecing index setting, noil level setting: head to heat, Overall machine. Unicom, draw box drafting auto mation in comber.		Industrial visit
61-62.	**Draw frame:** Introduction to Draw frame, Functions of various parts, material passage. Gearing diagram of the machine. Machine speed particulars.	Functions of various parts, material passage. Gearing diagram of the machine.	Gearing diagram	Calculation for finding of various change gears in Draw frame, Draft
63-64.	Maintenance schedule of the Draw frame & General cleaning. Headstock timer belt checkup, coiler mechanism overhauling, stop motion, clearer, roller setting, pneumafil fan suction & net checkup.	Headstock overhauling, draft gear overhauling, timer belt checkup, coiler mechanism overhauling, stop motion, clearer, roller setting, pneumafil fan suction & net checkup.	Drawing of Timer belt Coiler Mechanism, Clearer. Roller Setting and Draft gear, Different drafting system	
65-66.	Function of draft change gear, break draft change gear, tension draft change gear. Top roller pressure checking, cots buffing. Automation in Draw frame.	Function of draft change gear, break draft change gear, tension draft change gear. Top roller pressure checking, cots buffing. Setting of auto levelers.	Concept of preparation of assembly drawing and detailing.	
67-68.	**Simplex:** Introduction to simplex, function of various parts of the machine, passage of material, stop motion switches, motor plate alignment, setting of belt cots buffing, inching motion,	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	Box of tricks. , Tension calculation	Calculation of bobbin speed, flyer speed, differential gear

	creel guide roller checkup & oiling, photo sensor settings			
69	Maintenance schedule of the simplex machine. Headstock overhauling, draft gear overhauling, draft roller setting, top arm pressure gauge & saddle gauge, needle bearing greasing**.**	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.	Diagram of building mechanism of modern speed frame	Calculation of TPI, twist factor
70.	Bobbin rail leveling, differential box oiling & noise check up, builder motion overhauling flyer alignment, false twister types, spacer & condenser. Salient features of new generation speed frames. Automation in speed frame	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.		
71-72.	**Ring frame:** Introduction to Ring frame, function of various parts of the machine. Design of roller stand, bobbin holder, top rollers ball bearings, needle bearings, cots and apron specifications, drafting system, Lappet, balloon control rings, separator, Ring rail movement, builder motions, Ring and Travellers, profile matching, High speed travelers.	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. High-speed spindles. Spindles drives.	Gearing diagram, different drafting system	Calculation of draft, C.P, TPI, Twist factor, ratchet, traveler wt.
73 –74.	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.	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.	Details of assembly of shaft and pulley	Apron specifications, Roller settings

75-76.	Spindle oil replenishing, greasing of top roller & jockey pulley, traveler clearer setting, traveler change, and Jockey pulley setting. Salient features of new generation ring frame. Creel, drafting systems, apron specifications.	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.	Details assembly of bush bearing.	Do
77	Do	Introduction of various Spinning Systems For diversified products.	Do	Do
78	Class Test	Class Test	Class Test	Class Test

Semester-IV Duration – 6 Months

79-80.	**Winding:** Introduction to winding, function of various parts of the machine, yarn clearing system & its setting. Maintenance schedule of the winding machine.	Models of various winding machines. Function of various parts of the machine. Maintenance schedule of the winding machine.		
81-82.	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.		
83-84.	**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	Sketching Splicer, Setting of Knife blade, Balloon Breaker and Cone Holder.	
85-86.	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	Sketching of individual motor drives to Winding Drums.	

87-88.	**Maintenance of spinning machinery:**			
89-90.	Equipment history records, inventory control, preventive maintenance checklist, machinery audit check points.	Equipment history records, inventory control, preventive maintenance checklist, machinery audit checkpoints, Application of mechanic tools, machinery erection, modernization.		Importance of Statistics-Measures of location: Arithmetic mean, Median, Mode, Geometric mean and Harmonic mean
91-92.	**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.	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.	Diagram of opening rollers, motors, fiber flux distribution	Measures of Depression: Quartile deviation. Mean deviation,. Standard deviation and co-efficient of regression. Calculation of doubling factor, production
95-96.	**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.			Twist calculation of air jet yarn.
97-98.	**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 adjustment			Calculation of Inlet & Outlet speed, production for DREF-II & III

99-100.	**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.	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.	Yarn path in TFO	Twist calculation, Tension Calculation
101.	**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.	Introduction to ring doubler, types, creel, roller arrangement, rings, spindles, travelers, packages, and builder motions. Maintenance of machine: overhauling of headstock, spindle oiling, ring centering, ring rail leveling.	Sketching drives to spindle, Drafting Roller	Twist specification and relation between simple and double twist
102.	**Quality Assurance:** Concepts of quality, Control and Assurance. Introduction to ISO 9001, 2000, ISO 14000 and SA 8000, OHSAS 18001 systems, 5S Practices.	Familiarization to QA Systems: Visit to Companies which have ISO 9000 certification	….	…
103.	Testing of different yarn quality	Concept of yarn quality	REVISION TEST	REVISION TEST
104.	REVISION TEST	REVISION TEST	REVISION TEST	REVISION TEST

Social Studies : The syllabus is already approved and common for all trades.

List of Tools for a batch of 16 trainees

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

List of Shop General Outfit

S. No.	Name of tools & equipments	Quantity
1	Pliers side cutting 200 mm	6
2	Pliers flat nose 150 mm	6
3	Pliers round nose	6
4	Pliers long nose	6
5	Screw driver heavy duty 250 mm	5
6	Screw driver 7 mm x 300 mm square blade	6
7	Firmer Chisel 25 mm	6
8	Firmer Chisel 10 mm	6
9	Marking Gauge	6
10	Combination bevel Protractor	2
11	Cold Chisel Flat 25 x 200 mm	4
12	Cold Chisel flat 18 x 200 mm	4
13	Hammer Ball Pein 0.5 kg	5
14	Hammer Ball Pein 0.75 kg	5
15	Hammer Ball Pein 1 Kg	5
16	Hammer Cross Pein 0.5 kg	5

17	Wall jumper octagonal 37mmx450mm, 37 mm x 600 mm	2
18	Centre punch 100 mm	5
19	File Flat 300 mm rough	5
20	File Flat 300 mm 2nd cut	5
21	File Flat 250 mm Bastard	5
22	File flat 250 mm smooth	5
23	File half round 300 mm 2nd cut	5
24	File triangular 150 mm 2nd cut	4
25	Spanner double ended set of 6	5 sets
26	Adjustable Spanner 350 mm	2 sets
27	Foot Print grip 250 mm	2 set
28	Allen keys (Metric & Inches)	20 sets
29	Steel rule 300 mm	5
30	Steel Measuring Tape (2m)	5
31	Steel Measuring Tape (20 m)	2
32	Hacksaw frame Adjustable 200 mm to 300 mm	5
33	Spirit level 300 mm	3
34	Bench vice 150 mm	3
35	Bench vice 100 mm	2
36	Pipe Wrench (300 mm)	10
37	Spanner (up to 32 mm)	10
38	Vernier Caliper	2
39	Ring spanner	3 set
40	12” grip Plier	4
41	Inner caliper	5
42	Outer caliper	5
43	Box spanner	4 set
44	Torque spanner	3
45	File Swiss type needle set	5
46	Shore hardness tester for	1
47	Needle file	3 set
48	Nylon hammer	5
49	Puller 2 arm, 3 arm	3 each
50	Copper tube cutter	3
51	Ratchet brace 6 mm capacity	5
52	Ratchet bit 4mm and 6 mm	5
53	Vernier Caliper 200mm (ordinary)	5
54	Snips	5
55	Conduit Pipe die set	5

LIST OF MACHINERY & EQUIPMENT

A. Spinning Machinery (Miniature)

S. No.	Machinery	Required No,
1.	Blow room (Miniature)	1
2	Carding (Miniature)	1

3	Draw frame (Miniature)	1
4	Simplex (Miniature	1
5	Ring frame	1
6	TFO (Miniature	1

B. Maintenance Equipments		
Sl. No.	**Name of Equipments**	**Required No.**
1	Machine leveling gauge (Spirit level)	1
2	Greasing pump	1
3	Spindle oil lubricating machine	1
4	Roll trueing machine	1
5	Pressure gauge	1
6	Machine pulley adopter assembly (3arm, 4arm type)	1
7	Cots buffing machine	1
8	Tachometer	1