

**LIST OF TRADE COMMITTEE MEMBERS FOR THE TRADE OF  
PAINTER(GENERAL)**

**CHAIRMAN :**

**Shri S.K. GIRI** : **Director.**  
**CSTARI. Howrah.**

**SECRETARY :**

**Shri D.P. Nandi.** : Joint Director, of Training.  
CSTARI. Howrah

**MEMBERS :**

**S/Shri**

1. M. M.Ghosh. : Technical Managers,  
Shalimar Paints Limited,  
Howrah.
2. P.C. Chakraborty : Training Officer,  
Hoogly Docking & Engg. Co.  
Howrah.
3. Jeewan Kothari : Senior Architech,  
CPWD.  
Calcutta.
4. P.C. Chanda. : Managing Director,  
P.C. Chanda & Co. Limited.  
Calcutta.
5. R.Behl. : Technical Officar,  
Alkali Chemical Corporation.  
( I )Limited.  
Rushra.  
Hoogly.
6. K.S.Sundaram. : Divisional Engineer (Painting),  
Garden Reachship Builders &  
Engineers Limited.  
Calcutta.
7. P.K. Sarkar. : Sales Manager,  
East India Paints & Chemicals  
Works Limited.  
Calcutta.

**SPECIAL INVITEES :**

**S/Shri**

1. S. Somchoudhury : Additional Director of Industries  
(Training).  
Government of West Bengal,  
Calcutta.
2. S.S.Choudhury. : Regional Director of Apprentice  
ship Training,  
Nizam Palace,  
Calcutta.
3. S.P. Nandi. : Joint Director of Training.  
CSTARI,  
Howrah.
4. G.Jana : Principal,  
CTI, Dasnagar,  
Howrah.
5. S.R. Paul : Dy. Director of Training.  
CSTARI,  
Howrah.

**THE CRAFTSMEN TRAINING SCHEME**

**Syllabus of Practical Training & Related Instructions  
Including  
List of Tools & Equipments For the Trade  
Of  
PAINTER [GENERAL]**

**1. Total Duration of Training : 2 years.**

**2. Minimum Education :**

**Qualification : Passed 8<sup>th</sup> class Examination  
or its  
Equivalent.**

**TRADE: PAINTER (General)**

Period of Training: 2Year's or 104 Weeks

The following syllabus is for the first 52 weeks consisting of

1. Induction Training	-1 week
2. Allied Trade Training: Carperntry, Sheet Metal, Plumber, Electrician and M/c. Shop.	-19 weeks
3. Main Trade Training	-31 weeks
4. Test	-1 week
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Total	-52 weeks

Note: The syllabus has been divided two portions- the first 52 weeks & the remaining 52 weeks

<b>Week no</b>	<b>Practical Work</b>	<b>Trade theory</b>	<b>Engineering drawing</b>	<b>Workshop calculation and science</b>
1.	<b>INDUCTION TRAINING</b> Familiarisation with the Instt. –importance of the Trade trg.-Machinery used In the trade-type of work done by trainees in the Instt -Type of jobs made by the trainees in the trade-introduction to safety including fire fighting equipments and their uses etc.	Importance of safety & general precaution observed in the Instt. & In the section-Importance Of the trade on the development of Industrial Economy of the country. What is related instructions-subjects to be taught, achievements to be made recreational, medical facilities and other extra curricular activities of the Institute (All necessary guidance to be provided to the new comers to become familiar with the working of Industrial Training Institute system including stores procedures etc.)		
2.	Importance of the allied trades- types of work done by trainee in allied trades- Induction of practical in allied trade & their importance.	Related instructions under allied trade, subjects to be taught & their importance in the trade.	Freehand sketching of straight lines, rectangles, squares, circles, polygons etc.	Applied workshop problem involving multiplication & division common fractions addition, subtraction, multiplication & division application of fraction to shop problems.
3-4.	<b>ALLIED TRADE CARPENTER:</b> Marking out for carpentry work. Use of carpenters basic hand tools for simple operation viz. Sawing, plain, chiselling, drilling Etc. Grinding of tools.	Safety precautions, descriptions, uses & care of hand tools, their names, materials from which made & their uses. Grinding of tools and precaution to be taken.	-Do- Reading of simple blue print,	Common properties and uses of cast iron, wrought iron, plain carbon steel, high speed steel and alloy steel. Applied workshop problems as in Week No.2.
5-6.	Making simple carpentry joints, used in door, windows, timber-floors, panels, wooden partitions etc.	Types of woods their description and use common defects in timber and their effects.	-Do- Free hand sketching with dimensions of simple solids such as cubes rectangular blocks, cylinders etc.	Properties & uses of copper, zinc, lead, tin, aluminium, brass, bronze solder bearing metals, timber and rubber. Decimals – addition, conversion of decimals to common fraction-shop problems.
7-8.	Use of jointing devices - nails, screws, nuts, bolts & dowels joints by wooden filling by glue.	Common joints their description & use. Use of nails, screws hinges, dowels etc. Glue its specification, preparation of compounding and their application.	Sketching of views of simple solid bodies as mentioned above when viewed perpendicular to their surface and axes. -Do- Freehand sketching of nuts & bolts with	Brief description of manufacturing process of pig iron & cast iron. Reduction of common fractions to decimal fractions-shop problems. Brief description of manufacturing process of steel copper & aluminium. Metric-system-metric weights &

			dimension from samples.	measurement units- conversion factors.
9-10.	Planing & surface preparation of wood for varnishing & polishing.	Use of planer, different types & their functions.	Freehand sketching of rivets & washers with dimension from samples freehand sketching of keys & screw threads with dimensions from samples. -Do- Explanation of simple orthographic projection 1 <sup>st</sup> angle.	Shop problems on metric system of weight & measurement. Effects of alloying elements on properties of cast iron & steel. Square root the square A perfect square-the square foot of whole number and a decimal.
	<p>ACHIEVEMENTS: Should be able to:-</p> <ol style="list-style-type: none"> <li>1. Use carpenter hand tools.</li> <li>2. Make simple carpentry joints.</li> <li>3. Uses suitable jointing devices.</li> <li>4. Identify different types of timbers.</li> </ol>			
11.	<p>ALLIED TRADE-SHEET METAL:</p> <p>Importance of skills involved. Use of simple hand tools such as mallets scribe, steel rule, ships, groover etc. Use of ferrous sheet metals for the following operations marking, cutting, bending, folding. Development of surfaces from blue prints.</p>	Introduction to the trade. Safety precaution to be observed. Common hand tools used for sheet metals and definition, description, function and uses.	Explanation of orthographic projection 3 <sup>rd</sup> angle. View of simple hollow & solid bodies with dimensions. Use of different types of lines & symbols for drawing.	Mass-unit of mass, Force-absolute unit of force. The weight of body-unit of weight shop problems. Percentage at its application shop problem
12.	Joining of simple sheet metals of different gauges by simple self secured joints. Joining sheet metal by soft soldering. Joining of sheet metal by brazing.	Different types and uses of joints employed in sheet metal work. Description of common machines and equipment used in sheet metal. Brief description of brazing & soldering.	-Do-	C.G.S. and F.P.S. systems of units of force, weight etc. the Conversion –problems.
13-14.	To familiarise with machinery & equipment & the different types of containers & practice in making articles such as trays, cylinders & cones.	Sheet metal wire gauge, equivalent inch. & mm., Sizes of standard wire gauges. Metals commonly rolled into sheets such as tinplates, galvanised sheets, iron sheets, copper, brass sheets, aluminium sheets etc- brief description of physical properties of the above.	View of simple hollow & solid bodies with dimensions. Use of different types of lines & symbols for drawing. Simple isometric drawings of simple object such as square, rectangles, cubes, rectangular block etc.	Ratio & proportion shop problems. Algebra-algebraic symbols, addition, subtraction multiplication and division of expression involving algebraic symbols. Simple equation & transposition problems. Simple problems on work, energy & power.
	<p>ACHIEVEMENTS: Should be able to:-</p> <ol style="list-style-type: none"> <li>1. Use sheet metal hand tool &amp; equipment</li> <li>2. identify various types of sheet metals used in industry</li> <li>3. Make joints by soldering &amp; brazing.</li> <li>4. Make simple sheet metal article like, tray cylinders, cones etc</li> </ol>			

15.	ALLIED TRADE plumbing Plumber tools & their uses. Jointing stone-ware sockets pipes with cement mortar & cast iron pipes running, with lead & caulking. Erecting washbasins. Erecting simple sanitary fittings.	Introduction to the trade. Safety precautions and elementary first aid. Plumbers hand tools description & use. Description on erecting rain water & drainage piping system including installation of sanitary & water supply fittings.	Simple isometric drawings isometric views of simple object such as square, rectangles, cubes, rectangular blocks etc.	Standard algebraic formula e $(a+b)^2$ , $(a/b)^2$ etc, Simple simultaneous equipments with two unknown quantities.
16.	Joining of pipes of different materials & of different diameter .Use of different type of binding material for leakage.	Description of different types of pipes & their uses such as galvanised pipes, lead pipes, aluminium pipes, Brass pipes, plastic & synthetic pipes etc.	Simple isometric drawings isometric views of simple objects such as square, rectangles, cubes, rectangular blocks etc.	Meaning of friction example:
ACHIEVEMENTS: Should be able to:- 1. Use plumber's hand tools. 2. Identify different types of pipe and pipe fitting sanitary installations.				
17.	ALLIED TRADE- ELECTRICIAN : Practice in identifying series and parallel circuits different system of wiring , fixing & connecting appliance for domestic & industrials lighting.	Introduction to the trade. Safety precautions and elementary first aid treatment for electric shocks, burns etc. Elementary electricity. General idea of supply system. Electric fitting, system of wiring. Wiring installation for domestic & industrial lighting.	Use of drawing instruments T square & drawing boards.	Mensuration area of rectangle squares, triangles, circle, regular polygons etc. – calculation of areas.
18.	To familiarise with the electrical wires viz. V.I.R.,CTS Cables etc. and electrical fitting of panel board, switch board, joint boxes, conduit pipe wiring, tube lamp fifying, pump and motor installations.	General idea of conduit pipe or synthetic pipe wiring & its accessories I.E .Rules. Description of electrical wiring materials used for domestic purpose. Brief description of various electrical equipment used in industries viz. Generators, Motors, Transformers, Starters etc. & their uses.	Construction of simple figures & solids as mentioned above with dimensions & titles. Use of different types of scales in inches and mm.	-Do-
ACHIEVEMENTS: Should be able to:- 1. Use electrical hand tools. 2. Identify different types of wiring & electrical installations. 3. Take necessary safety precautions per I.E. Rules.				
19.	ALLIED TRADE – Machine shop : Basic hand tools and their uses. Handling practice of different hand tools.	Safety precautions for the trade. Brief description of different types of and tools and their functions.	Construction of simple figures & solids as mentioned above with dimensions & titles. Use of different types of scales inches & millimetres.	Calculation on volume & weight of simple solid bodies such as cubes & hexagonal prisms – shop problems.
20.	Identification of different machine tools, their components, functions and uses.	Brief description of various machine tools & accessories & their uses.	Lettering numbers and alphabets.	Heat and temperature-thermometric scale Fahrenhe & Centigrade scales and their conversion. Name & use of temperature

				measuring instruments normally used in workshops.
	<p>ACHIEVEMENTS: Should be able to:-</p> <ol style="list-style-type: none"> <li>1. Use different types of simple hand tools used in machine shop.</li> <li>2. Identify different types of machine tools and their accessories.</li> </ol>			
21.	MAIN TRADE TRAINING:			
22.	Preparing of surfaces on wood by cleaning, rubbing down, knotting, stopping, filling, artificial wood staining & graining.	Painter hand tools, brushes of various sizes, diamond glazier, stopping knife, scrapers, platteknife, chisel knife, shave hook plumb line, lining tool, rule file etc. –their description, use care & maintenance.	Freehand isometric sketching of simple objects with dimensions. -Do-	Shop problems on determination of volume and weight of simple solid bodies Calculating area and volume of wood in different shapes & sizes.
23.	Putty preparation, mixing of putty-different process of making, use of putty on different wooden surfaces.	Blow lamp-its use, care and maintenance. Putty definition, types, uses. Method of mixing & its different system of application.	Freehand isometric sketching of simple objects with dimensions. Freehand sketching of plan & elevation of simple object like hexagonal bar, square bar, circular bar, tapered bar, hollow bar etc.	Geometry – Properties of lines, angles, triangles & circles. Simple problems on lines, angles, triangles circles.
24-25.	Finishing, varnishing and polishing of wooden furniture such as chair, table almirahs, trays etc. both old & new furniture.	Varnishes-gold sizes, spur varnish, synthetic varnish. Preparation of different types of varnishes, resin varnish, synthetic varnishes, copal varnish etc. Pigments & extenders.  Oil, driers, resins, solvents & thinners-Description of each of the items, classification & uses.	Views of simple solid & hollow bodies cut by section plane. Reading of simple blue print.  Exercises on the print reading. Signs & symbols used in electrical drawings.	Effect of forces on material in such application as extending, bending, twisting and shearing  Trigonometry-Trigonometric functions-use of trigonometric tables applied problems.  Causation of areas of triangle polygons with the aid of trigonometry.
26-27	Preparing of surfaces on wood for varnishing, finishing, polishing of doors, windows, panels, partitions of rooms, wooden boxes etc.	Varnishes-Method of preparation-Different types-classification and their application on woods.	Exercises on blue print reading, Drawing simple circuits using colour representation Exercises on blue print reading.	Further use of trigonometric functions & tables applied problems.
	<p>ACHIEVEMENTS: Should be able to:-</p> <ol style="list-style-type: none"> <li>1. Prepare wooden surfaces for varnishing.</li> <li>2. Prepare and use putty.</li> <li>3. Prepare varnish and use the same.</li> </ol>			
28-29.	Metal pre-treatment such as scraping, rubbing by emery cloth, wire brushes, buffing etc.	Corrosion-causes of corrosion, effect of atmosphere in different places.	Free-hand sketching of simple objects related to the trade & preparation of simple working drawings from the sketches. Free hand sketching of simple objects related to the trade &	Further practice in calculation involving area and volume of wood & workout total cost on the basis on given rates.

			preparation of simple working drawing from the sketches.	
30-31.	Metal pre-treatment such as pickling, phosphatising, Sand blasting etc.	Corrosion on different metals both ferrous and non-ferrous- factors controlling corrosion- corrosion test- atmospheric, water, soil etc. –Protection against.	Freehand- sketching of simple objects related to the trade & preparation of simple working drawings from the sketches. Panel board layout of an electroplating-shop.	Electricity and its uses. Elect current –positive and negative terminals. Use of switches and fuses. Conductors and insulators, Reading of simple graphs.
32-33.	Preparing of surfaces for primary coat of different metals, practicing by brushes of various sizes- setting and application practice.	Brushes-description, sizes & uses. Method of application, process for coating different metals, precaution, care and maintenance.	Further practice in blue print reading & exercises related to the trade.	Calculation of volume & weight of simple solid bodies by using logarithm. Further problems on menstruation as above.
34-35.	Finishing painting by brushes on the metal surfaces like trays, boxes, containers, tables, chairs etc.	Painter's equipments- ladder-step scaffolding- trestle buckets etc. Their description & use.	-Do- Freehand sketching of simple objects related to the trade & preparation of simple working drawing from the sketches, Sketches of electroplating barrel.	-Revision- Plotting and reading of simple graphs.
37-38.	Metal pre-treatment such as pickling, phosphatising, sand and shot blasting, buffing, wire brushing etc.	Corrosion-its effect & types methods to prevent corrosion, purpose of metal pre- treatment, description of various method and field of application.	-Do- Sketching an electroplating vat, Care and use of drawing board, T-square and instruments.	Different forms of energy heat: mechanical and electrical- examples. Conversion from one to another. Practice in the use of multiplication, division square, cube, square root, cut etc.
39-40.	Primary colours, colour blendings by mixing of various ingredients in different colours for brush painting & spray painting.	Paint-definition, classification, & uses. Method of selection, application preparation, techniques. various types. Their purposes and its effect on paints.	Freehand sketching of nuts & bolts, Preparation of drawing of the above ( Measuring of working drawing should be explained).	Use of Logarithmic table as above.
41-42	Printing by brushes of Wooden furniture such as Chairs, tables, trays, almirahs, racks, boards, panels etc.	Painter's equipment such As-ladder, step scaffolding, trestle, buckets etc., Their description & uses. Mixing of paint, tools & Equipment used for mixing-description, uses With safety measures. Nitrocellulose / shellac Lacquers for wood-problems associated with painting of different Types of wood.	Simple blue print reading of objects as far as Possible. Freehand sketching of Different forms of threads.	Use of logarithmic tables as above. Properties & uses of cast iron.
43-46	Painting by brushing of cast iron pipe, steel pipe and galvanised pipes, lead pipes, aluminium pipes, synthetic pipes etc. METHOD PAINTING Different types of pipe	Basic knowledge of symbol of different pipe lines such as gas, steam, water, oil, chemicals etc. Precaution against air polluting. Application of standard	Preparation of drawings of above conventional representation of threads. Reading of simple blue Prints simple exercises (44 <sup>th</sup> week).	Use of logarithmic tables as above. Properties and uses of copper and aluminium. Calculation of area, volume & weight of simple solid bodies such as cube, squares, hexagonal prisms-application



	lines such as hot and cold water, liquid & gas chemicals and oil, steam pipe lines etc.	paints approved by I.S.I.	Freehand sketching of lockings in position (46 <sup>th</sup> week). Simple exercises on blue print reading.	to shop problems Properties & uses of lead, tin zinc, brass, bronze, high carbon steel and alloy steel.
	<b>ACHIEVEMENTS:</b> The Trainees should be able to:- <ol style="list-style-type: none"> <li>1. identify corroded parts and know methods of corrosion prevention.</li> <li>2. Know the pre treatment process and handle the tools &amp; equipment.</li> <li>3. Mix various types of paints to produce different colours.</li> <li>4. Use various types painting brushes.</li> <li>5. Paint different wooden and metal surfaces.</li> <li>6. Identify different types of pipe lines &amp; paint them.</li> </ol>			
47-48	Practice on metal surfaces with the help of spray painting plants with compressed air.	Description of various spray painting plants & equipment, method of construction their fields of application, safety precaution etc.	Freehand sketching of rivets and riveted joints. Freehand sketching of different types of riveted joints.	Further practice in problems menstruation as above. Different between mass & weight.
49-50	Practice in painting by dipping the metal surfaces, like trays, boxes, containers, castings frames, garden benches etc.	Roller coating machine dipping by hand & mechanical devices , different types of ovens, their construction working principles, field of application, safety precaution.	Preparation of drawings of riveted joints. Further practice in blue print reading and experience related to the trade.	Problems on menstruation as above. Revision.
	<b>ACHIEVEMENTS: The Trainees should be able to: -</b> <ol style="list-style-type: none"> <li>1. Handle spray-painting equipment.</li> <li>2. Paint wooden and metal surfaces by spray painting process</li> <li>3. Use hand tools and mechanical devices for dipping</li> <li>4. Paint various metal surfaces by dipping process</li> </ol>			
51	----- Revision -----	----- Revision -----	----- Revision -----	-----Revision -----
52	..... TEST .....			

**SYLLABUS FOR THE 2<sup>ND</sup> YEAR OF 52 WEEKS IS AS FOLLOWS**

53-54	Preparing surfaces of walls & ceiling, cleaning rough surfaces for distempering. Practice in use of nail brushes, iron hit, chiselling, rubbing by emery & brushes etc.	Description of bonds for plastering walls. Techniques of constructing walls. Methods of erecting scaffolding. Purpose of cleaning walls surfaces & their effects & processes of cleaning, different methods of cleaning, its description, precautions and uses.	Freehand sketching and blue print reading.	Problems on menstruation. Preparation of simple estimation.
55-58	Mixing paints & colour making. Distempering walls, matching colours for ceiling and walls, relief painting and texturing of walls and ceiling. Method of making scaffolding.	Dry distemper, cement colour for floor, cement paint, lime colour making process for distempering & cement paints, precaution and application process.	Freehand sketching of pipe joint flanged joint.	-Do-
59-60	Painting of walls with oil colours. Preparing wall for oil paints, mixing of paints.	The methods employed in preparing surfaces for oil painting of wall various painting faults and their remedies. Method of wall painting with oil colour paint. Emulsion paints for buildings.	Freehand sketching of pipe joint – screwed sleeve joint.	Density of solids and liquids- simple experimental determination.
61-62	Painting of walls with oil colour. Mixing paints & colour making. Painting walls & ceiling.	The method employed in preparing various oil paints. Remedies of at morphemic corrosion, calculation of the amount of paints needed for the amount of paints needed for the jobs.	Preparation of drawings of pipe joints. Exercises on blue print reading.	Specific gravity principle of Archimedes. Relation between specific gravity and density.
63-64	Painting of walls with oiled colour of residential house, colouring of door & windows fittings, electrical fittings, water supply pipe lines house drainage sanitary fittings etc.	Painter's equipments classification, function & their uses- principles of spray gun painting. Method of application and precautions analysis of rates for simple items of works. Schedule of rates specification .	Freehand sketching of shaft couplings – muff coupling with keys, spigot Ted flanged coupling forged with shaft or keyed in place, catered sleeve joint. Knuckle joint. Preparation of drawing of the joints from the sketches drawn.	Quantity of heat. Specific heat of solids liquid & gases heat gained & heat lost. Simple problems on heat gained and heat lost.
65-66.	Paintings with oil colour, water colour of a buildings, office buildings, iti workshop building inside & outside fittings including sanitary drainage water supply, gas pipes etc.	Buildings painting by spray gun and brushes, difference – specific application & their defects & remedies. Different colour used, selection of paints for different types of fitting, electrical, water supply, sanitary & drainage line	Exercises on blue print reading. Freehand sketching of simple bearings with bearing blocks.	Further problems on menstruation area of circle & elapse volume and weight of regular cone and weight of simple hollow bodies problem related to the trade.

		etc.		
	<p><b>ACHIEVEMENTS: The Trainees should be able to: -</b></p> <ol style="list-style-type: none"> <li>1. Prepare wall surfaces for distempering and painting.</li> <li>2. Mix paint for wall painting.</li> <li>3. Paint wall of residential and workshop buildings.</li> <li>4. Paint sanitary, fittings electrical fittings, pipefittings, door and windows fitting including wooden fittings</li> </ol>			
67-70	Sign painting practice in freehand sketching for geometrical shapes, human figures, animal figures and natural scenes with black & white by pencil & colours (both) cutting stencils of gothic letters & roman letters, lettering different types of lettering roman, gothic, architectural, ornamental and freehand. Cutting ornamental stencils in cardboard lettering practice on different languages of at least 3 languages.	Methods of stencilling special types of stencils. Care of stencils. Drawing instruments used in lettering use of T-square & drawing instruments used in lettering use of T-square & drawing board, method employed, precautions to be taken lettering description, types & their uses, common practice	Freehand sketching of simple bearing with bearing blocks. Preparation of working drawing of simple bearings.	Problems on menstruation as above.
71-72	Painting letters & figures of different types, signals name board, advertisement etc.	Conception of colour primary secondary & tertiary. Definition of colour, terms such as tint, shade, hue, tone monochromic, warm colours, glossary of terms for paints & enamels their nature constituents of paints & method of manufacture. Different types of paints as primer surfaces, under coats, full gloss paint and enamels.	Freehand sketching of pulleys and preparation of working drawings.	Problems on menstruation as above.
73-74.	Sign board painting in deferent media, chart, poster festoon, banner, models etc. Use of hand made paint (powder mixing) Ready-made enamel paint, watercolour.	Method of mixing powders pigments deferent types proportion and colour making. Linseed oil, turpentine oil and varnish- their function and its properties- application of mixing paint.	Exercises on blue print reading.	Further practice on problem involving estimation of material for painting.
75-76.	Painting of walls system of lay out- Advertisement, Industrial and commercial painting. Layout of painting with combination colouring viz. Cinema posters (Including scenery, lettering and portrait).	Painting of walls-Layout process- types- Use of paint. Combination of all types. Method of evaluating the job works, estimating and costing. Preservation of painted articles, posters etc. General idea of commercial artist definition activities.		

	<b>ACHIEVEMENTS: The Trainees should be able to: -</b>			
	<ol style="list-style-type: none"> <li>1. Prepares Letters and figures of deferent types and stencil cut on paper and board.</li> <li>2. Paint letters &amp; figures of different types.</li> <li>3. Paint posters, charts, banners, festoons, signboard model etc.</li> <li>4. Paint wall scenery, advertisement, cinema posters etc.</li> </ol>			
77.	Preparation of pigment with oil, driers, resins, etc. Practice in the mixing and matching of colours, coloured objects and materials in both oil & water medium.	Pigment, definition, types of pigments, properties of pigments manufacturing processes, their different types and uses. Application of oil driers, resins etc. & their purpose, colour pigments, matching of colours in both oil and water medium.	Isometric Drawing- construction of isometric scales.	Simple problem related to labour and material estimatio
78-79	Testing of different paints and varnishes for special gravity weight palter viscosity, hardness gloss and finish, adhesion, flexibility & drying time.	Method of testing paints and varnishes,	Isometric views of simple object related to the trade.	Do-
80-81	Stove enamelling of sheet mental & cast iron articles such as cycle parts , fun parts Etc.	Enamel is air drying & staving. Testing of oil strainers, dry pigments, volatile paints thinners, viscosity drying gloss finish, weight per litre, flexibility & adhesion	As above from given views in orthographic projection	Example on simple supportec load beams.
82-83	Novelty finishes both air drying & solving of different articles such as fans, type writers, ovens etc.	The procedures involved in novelty painting, precaution to be taken colour schemes.	Views of simple solid cut by section planes true views of sections.	Problems in Menstruation as above.
	<b>ACHIEVEMENTS: The Trainees should be able to: -</b>			
	<ol style="list-style-type: none"> <li>1. Test different paint and varnishes for gravity, viscosity and hardness etc.</li> <li>2. Stove enamel sheet metal and cast iron articles with novelty finish.</li> </ol>			
84-87	Painting on machine tools , such as lathe, shaper, planer slitter milling machine ,grinding machine boring machine etc. including accessories. Tools and equipment of different types- brushing spraying , dipping, removal of paints & surface treatment use of masking equipment.	Process of pre-treatment of metal, surfaces. Standard colour code practices as per classification. Process of painting different type of machine tools, equipment, spare parts etc.	Development of surface of simple objects. Construction of simple serves of enter penetration.	Plotting of graphs of simple equations reading of graphs.
88.	Repairs of painting defects, preservation of bleeding, blistering, blooming chalking decolourisation, fading, lifting, chalking, cracking wrinkling, flaking, sealing, peeling off, runs & sags blistering and peeling, pine-holding, orange peeling, blushing,	Treatment of various defects arising while painting and their remedies, common coating failures, causes and remedies such as lifting, checking, creaking, wrinkling etc.	Construction of simple crevice of interpenetration.	Centre of gravity –simple experimental determination.

	missing etc.			
89.	Practice on silk screen painting in deferent media such as festoon, posters etc.	Description of silk screen painting. Preparation of surface prior to the application of textures. Various process of painting of silk screen. Precaution during painting.	--Do--	--Do ---
90.	Furniture description- job work –decoration of new furniture such as book shelf, dressing table, job-work decoration of old furniture dining room, dressing room, kitchen room, toilet room etc.	Deferent colour used, shades and their effects procedures of decoration etc. Patching work, cleaning the various surfaces curved, round ornamental grills etc. methods of work applied for various painting surface, instruments used in deferent position for cleaning and painting. Precaution for colours painting in same parallel surface.	Development of surfaces.	Reading and plotting simple graphs.
<p><b>ACHIEVEMENTS: The Trainees should be able to: -</b></p> <ol style="list-style-type: none"> <li>1. Remove paints; prepare surfaces &amp; paint machine tools &amp; equipment etc.</li> <li>2. Repair painting defects.</li> <li>3. Repair silkscreen painting.</li> <li>4. Repair job work decoration of new &amp; old furniture etc.</li> </ol>				
91.	Spray painting in deferent surface like corners, round parallel, curved surface, angles, rectangular, cone, cylinders, square, adjustment of spray gun stroke & holding spray-gun etc. for multipurpose work.	Spray painting equipment, spray-gun deferent types, methods of spraying techniques on various surface. Precaution in holding spray-gun & spraying stroke.	Development of surface.	Stable, unstable and neutral equilibrium of bodies- simple explanation.
92.	Practice of painting safety colour code on deferent symbolic articles & identification of pipe lines as per international & Indian standard .	Various colour codes & identification of pipe lines as per international & Indian standard.	Freehand sketching of small parts related to the trade.	Reading & plotting of simple graphs.
93	Spray painting with compressed air atomisation, practice in deferent types of spray-guns wiz externally fed spray-gun section, pressure & gravity feed guns, catalyst spray guns with external mixing of catalyst & resin-their application.	Various types of spray guns and their accessories used in industry their maintenance, techniques of their use safety precautions.	Freehand sketching of simple assembled parts.	Friction- limiting friction- law of friction- co- efficient of friction- angle of friction.
94	Practice of airless & electrostatic spraying such as Hydraulic Airless spraying, electrostatic spraying – Rustburg No.1 process and No.2 electrostatic hand guns.	Airless & electrostatic spraying – description, safety precaution. Comparison between air & Hydraulically operated guns.	--Do--	Simple estimation on the requirement of materials etc. related to the trade.

	Rustburg electro-air gun, stat air gun, Rustburg electro- Hydraulic gun.			
95.	Practice on Rustburg electrostatic blade coater, high tension supplies for electrostatic spraying, handling of electromagnetic generators . safety devise in electrostatic spraying, application of electrostatic spraying. Handling of paint for electrostatic spraying.	Rustburg electrostatic blade coater- description, its use. Paints used on electrostatic spraying deferent types of paint & mixing procedures.	Freehand sketching of simple assembled parts.	--Do --
<p><b>ACHIEVEMENTS: The Trainees should be able to: -</b></p> <ol style="list-style-type: none"> <li>1. Do spray painting in different surfaces like corner, round, curved cylinder etc.</li> <li>2. Paint safety colour codes as per International &amp; Indian Standards.</li> <li>3. Identify pipelines as per International &amp; Indian Standards.</li> <li>4. Do spray painting with different types of spray guns.</li> <li>5. Handle airless and electrostatic spraying, Rausburg electrostatic blade coater.</li> </ol>				
96.	Practice on deferent types of spray booths such as simple cabinet booth, back extract, wet booth etc. for spray painting of various parts stack cleaning, spray booth water treatment, handling paint sludge, booth cleaning.	Different types of spray booths-system of inlet & outlet of the booths,	Both size-both development cellulose solution regulations. Solutions. Regulations. Description of filtrations equipment.	Freehand sketching of detaile components from assemblies
97.	Spray painting on machines & cast surfaces finishing of iron casting pre-treatment for removals of paints and surface treatment-Fettling degreasing-solvent wiping-Grease burning – removal of scale. Finishing priming – puttying and filing end surfacing, finishing coats. Practice on other types of machine castings, non-ferrous castings, sheet metal finishing etc.	Different type of pre-treatment processes cleaning of the surfaces. Method of spraying on various ferrous & nonferrous castings, sheet metal containers. Use of higher performance coatings like chlorinated rubber & epoxy paints.	Freehand sketching of detailed parts & production of working drawings of the parts.  Production of working drawings as above.	Problems on simple estimatic as above.
98-99	Spray painting on Car body- finishing – pre-treatment process , primer, surfaces staving , wet sanding, synthetic finishing cellulose finishing, acrylic finishes (thermo – setting) finishing sheet metal components etc. spray painting on scooters and motor cycles including pre-treatment processes.	Method and application processes of car body finishing various types of systems of spray painting and their effect on metal surfaces. Synthetic, cellulose & acrylic paints and finishing.	Production of working drawing as above.	Problems on simple estimatic as above.
100	Spray painting practices on refrigerator & domestic appliances – pre-treatment of surfaces-priming-	Staving , methods of heat transfer, time temperature relation in a staving oven. General	Production of working drawings as above.	Problems on simple estimati as above.

	finishing coats. Refrigerator liner finishing.	idea of oven design and their classification. Safety precautions in use of ovens.		
	<b>ACHIEVEMENTS: The Trainees should be able to: -</b>			
	1. Do spray painting on different types of booths. 2. Do spray painting on machine and cast surfaces. 3. Do spray painting of car, scooter and motorcycle bodies and their components. 4. Do painting of Refrigerator and domestic applications.			
101	Dismantling assembling & fitting of painting and varnish equipment and accessories and their routine maintenance. Handling practice of fire fighting equipment & its safety precautions.	General idea of ISI specifications on paints & varnishes. Function of different types of fire fighting equipment, safety precautions.	Exercises on blue print reading.	Magnetic substances natural and artificial methods of magnetisation-use of magnet.
102	Practice in storage of paints handling & storage of materials, conveying, lifting & weighing. Systematic arrangement for keeping paint containers.	System of storing-storage of paints & lacquers, solvents & thinners, painter's tools, including spray painting equipment etc. Maintenance of store records.	Revision & exercises on blue print reading.	Simple electric circuit – ohm Law simple calculation.
103	Revision practice of varnishing of wooden surfaces, painting by brushing , painting of walls and metal surfaces, painting of letters and figures, spray painting.	Methods of estimating labour, materials & costing procedures for painting & varnishing , preparation of work schedules.	- Do -	Revision

**ACHIVMENTS: The trainees should be able to:**

- (1) Handle painter's tools, equipment & machinery.
  - (2) Carry out routine maintenance.
  - (3) Handle fire-fighting equipment.
  - (4) Store paints and painter tools & equipment.
  - (5) Prepare estimate for labour and materials and find out costs for painting work.
- 104.....Revision and Test..... ..revision and test

**Final achievements: The trainees should be able to:**

- (a) Carry out simple jobs in the trade of carpenter, sheet metal, plumber's, Electrician.
- (b) Handle simple hand tools & identify different machine tools.
- (c) Prepare surfaces of various materials for varnishing & painting.
- (d) Carry out finishing, varnishing & polishing of wooden furniture.
- (e) Distemper and paint building including fittings.
- (f) Carry out sign painting with paints & water colour viz. Poster charts, advertisements, silk screen painting.
- (g) Carry out spray painting of different metal surfaces with good finish.
- (h) Handle machinery & equipment for mixing paints.
- (i) Prepare Estimate.
- (j) Handle storage of paints & painter tools and equipment fire fighting equipment

Note :-

- (1) For practical training in allied trades the facilities available in the I Institute for other trades as per syllabus should be utilised. Out of a Batch of 16 trainees, one or two trainees at one time, may be permitted .to work with the trainees of different sections to receive practical training. The trainees may be rotated according to a schedule prepared in consultation with the Instructors/Group Instructors of different trade concerned. No additional tools & equipment for practical training in allied trades have been provided separately for this trade.
- (2) The syllabus given above is a guide line for the Instructors of training will depend on the facilities available in the Institute concerned.

Table 1

**TRADE PAINTER**

Table 2

TRAINEES TOOL KIT:	FOR INSTRUCTOR	FOR TRAINESS
1. Rule wooden 4 fold 60 cm	1	16 Nos.
2. Divider steel 150 mm	1	16
3. Plumb bob 2 oz	1	16
4. Brush Dodger softener 25 mm	1	16
5. Brush stencilling	1	16
6. Brush writing	1	16
7. Brush Flat wall 50 mm	1	16
8. Brush Can paint	1	16
<b>TOOLS, MEASURING INSTRUMENT &amp; GENERAL SHOP OUTFIT :</b>		
<b>TRAINEES TOOL KIT: For Trainees</b>		
1. square 150 mm Blade		4
2. Scriber		4
3. Sliding T – Bevel		4
4. Marking Gauge		4
5. Wing Compass		4
6. Hand Saw 450 mm		2
7. Tannin Saw 300 mm to 375 mm		2
8. Jack Planes		4
9. Smoothing Plane		4
10 Mallet		4
11 Carpenter' Hammer		4
12 Chisel Firmer 6 mm, 25 mm set		2sets
13 Chisel Mortise 9 mm		4
14 Bardwell		4
15 Trying Plane		4
16. Ratchet Plane		2
17. Grooving Plane 3 mm., 6 mm. Each plough		1 sets of each



18. Firmer Gauge 6 mm., 9mm. & 19 mm. Each	1 each
19. Bracer	2 Nos.
20. Brace bits 3 mm x 12 mm by 1.5 mm	1
21. Auger hand 19 mm., 22 mm., 25 mm	1
22. Trammel	2
23. Spoke shave 63 cutter	2
24. Gimlet 3 mm. And 7.5 mm	2
25. Oil stone 150x50x25xmm	2
26. Blow Lamp 500 ml	4
27. Brush varnish 25 mm. Oval bevelled	4
28. Brush distemper 25 mm	4
29. Brush round 9 mm. Paint or varnish	4
30. Brush Hog Hair Fitch	4
31. Brush Flat 12 mm. Varnish	4
32. Brush Dusting	4
33. Brush White Wash	4
34. Knife Put Glazier	8
35. Knife Chisel	8
36. Knife Stopping	8
37. Knife Hacking	4
38. Knife Palette	8
39. Scraper Dapper Hanger	2
40. Strainer paint	3
41. Pliers Insulated	2
42. Paint Burner ( Acetylene Gas)	1
43. Screw Driver 200 mm	2
44. Steps Painter	2
45. Trestle Painter with stools	16
46. Aerograph (Air Brush)	1
47. Spraying Mask	4
48. Working Bench 240 cm x 120 cm x 75 cm	2
49. Carpenter Vice 225 mm	4
50. Bench Vice 125 mm. Jaw	2
51. Combs (Steel)	4
52. Stencil Knife	16
53. Pallets	16
54. Beam Compass (Stencil cutting)	1
55. Trimming Knife	2
56. Metal straight edge with cutting wheel	2
57. Lay Brush	2
58. Physical Balance with weight box	1
59. 100 ml. Graduated Glass Cylinder	2
60. Weight per litre cup	2
61. For 1 cup No. 4 for viscosity measurement	2
62. Stop Watch	1
63. Mild steel panels 150 mm x mm (18x22 SWG)	24 No
64. Mild steel panels 300 mm x 200 mm (18x22 SWG)	24 No

65. Sand or shot blasting equipment complete with accessories (Smallest available)	1 No.
66. Porcelain Basin 450	6
67. Porcelain Basin 300	6
68. Porcelain Basin 200	6
69. Marble Slab 750x300	2
70. Staving Oven	1
71. Fire Extinguisher	2
72. Fire Buckets with stand	4
73. Steel Lockers with 8 drawers	2
74. Metal Shelving Rack open type 1800x900x500 with 4 adjustable shelves.	1
75. Desk	1
76. Black board with case	1
77. Stool	1
78. Pneumatic chippers	2
79. Orbital wire brushes	2
80. Pneumatic needle gun	2
81. Flame cleaning grill	2
82. Flatter Roller	6
83. Portable Electrical hand grinder	1
84. Face Mask & Respirator	6
85. Disc grinder set	1
86. Goggles	6 sets
87. Gloves	6 sets
88. Ladder	1
89. Trestle	1
90. Scaffold	1
91. Mandrill	1
92. Gloss meter	1
93. Scratch hardness tester	1
94. Resistively – Meter	1
95. Grinding Gauge	1

### GENERAL INSTALLATION

1. Gun spray with gravity feed cup complete with accessories and portable electric air compressor
2. Airless spray-gun with complete accessories
3. Electrostatic spray-gun with accessories
4. Pressure Feed Container 20 litre capacity

- N.B. 1. The specifications of a number of items in the above list have been in Metric Units, Measuring Instruments such as Steel Rule which are graduated both in English and Metric units May be procured, if available.
2. Indian Standard Norms may be followed by the Instructional staff in respect of instructional materials and material

specifications for training purpose as far as possible.

### **A SYLLABUS FOR PRATICAL TRANING**

First & Second Year Sam As That For The Trade Of Painter(General) Under Craftsmen  
Training Schemes

#### **THIRD YEAR SHOP FLOOR TRANING**

1. Instructional safety precautions on the shop-FLOOR.
2. PARCTICE IN FEE HAND SKETCHING OF HUMAN FIGURES ANIMAL FIGURES, GEOMETRICAL FIGURES, LAND SCOPS ETC. IN PENCIL, OIL & WATER MEDIA.
3. Practice in using of graphs for accurate drawing & enlarging of small units
4. Practice in painting of letters for name plates, road, signs, signals and various types of advertisement
5. Practice in painting of sign-board paintings, banners, festoons of different sizes and nature .
6. Preparation of industrial & commercial paintings and preparation of big hoardings on different surfaces like play board, tin, mistune board etc.
7. Preparation of cinema posters in multi- colour including lettering and drawing of portraits on it.
8. Preparation and use of single or multiple plate stencils positive and negative according to need.
9. practice in preparing of metal surfaces by rubbing with emery, scraping, wire brushing and manual chipping.
10. preparing of metal surface with mechanical pneumatic chippers.
11. Preparing of surface of steel body by portable grinder.
12. descant ling of metals surface by vacuumed blast machine.
13. flame cleaning of rusted surface.
14. pre-treatment of ferrous and non-ferrous surface by degreasing, etching, pickling, and solvent wiping.
15. cleaning and wiping of the deferent surface to be painted to the required standard.
16. preparing of adhesive compound like putties, fillers and metal cements and applying them on metal and wooden surface.
17. Selecting, mixing and preparing of all types of oil paints and water paints.
18. Selecting, mixing and preparing of all types of synthetic paints and such other paints to obtain specific colours.
19. Sand or grit blasting of metal surface for painting by sand blasting machines.
20. pre-treatment, applying of primer coats and spray painting of surface on car body and finishing by deferent processes.
21. Pre-treatment and spray painting of surface on scooters and motor cycles.
22. Pre-treatment, applying of primer coats and spray painting of surface on refrigerators/ domestic appliances.
23. pre-treatment, applying of primers and spray painting on the surface of steel furniture like Elmira, chairs , table, trays , Racks etc.
24. practice in stove enamelling of deferent articles such as cycle, fan, type writer parts etc. for novelty finish including air drying.
25. practice in silk screen painting, use of mask and templates.
26. Practice in staging work, scaffolding and painting at height.
27. Handling of deferent types of spray painting machines in deferent types of painting booth including spray guns.
28. Rectifying the common coating failures and repairing of various painting defects .

29. Testing of deferent paint send varnishes regarding fluidity, spreading , density, viscosity, adhesiveness, drying hoarding etc.
30. Interpretation of the lay out or design and subsequent adoption of them for painting.
31. Practice in cleaning and maintaining of all tools and equipment required for painting.
32. Practice in safe way of storage of paints and varnishes.
33. Maintenance of painting schedules and following I.S.I. specifications and other painting regulations.

**B.- Syllabus For Related Instruction**

Related instruction should be imparted to all the apprentice during the Entire period of training including basic training. The syllabus given for related instruction should be considered as a guide.

The subjects to be taught to the apprentice in Related Instruction are:

1. TRADE THEORY
2. WORK SHOP CACULATION AND SCIENCE
3. ENGINEERING DRAWING
4. SOCIAL STUDIES

**FIRST AND SECOND YEAR**

The content of the syllabus for the apprentice during first and second year of training will be the same as the content of the first and second year of the two-year course for I.T.I. trainees in the trade.

**THIRD YEAR**

1. TRADE THEORY: (3 hours per week or 150 hours per year approximately).

1. Safety at work-accidents do not happen, they are caused.
2. Instructions in safety precaution against fire, explosion & poisoning hazards, danger in breathing of fumes, gases & dust.
3. Knowledge in special types of brushes and hand tools used for deferent types of painting jobs- application technique and care.
4. Knowledge in other tools and equipment for the trade such as pneumatic chippers, hammers, portable grinders, scrapers, send/ grit blasting machine, vacuum blasting machines, flame cleaning unit, stove enamelling etc-their operation and application techniques.
5. Knowledge in spray painting equipment with compressed air and airless spray-gun, their correct operating techniques and application.
6. corrosion- definition, cause and remedies.
7. Putties fillers, metal cements- their physical properties, composition and application.
8. Classification of pigments according to their derivation of lead, zinc, iron, manganese etc. and deferent properties of pigments such as oils, enamels , varnishes, diluents, synthetic resins etc.
9. deferent types of paints and varnishes including synthetic paints- brief description of their manufacturing processes and uses. Methods of testing paints and varnishes.
10. Paints consumption corresponding to covering capacity of paints- loss in application. Knowledge in estimating the cost & method of evaluating the job.
11. mixing of paints, colour matching by mixing of deferent colours for getting deferent shades in deferent media- brief description of process.

12. Pre-treatment process of various surface of cars, scooters, refrigerators, furniture and domestic appliances- brief description.
13. Knowledge in paint remover- precautions taken.
14. Scientific storage of paints and varnishes- precautions taken.
15. Brief description of paints components.
  - (a) Base (b) Filler (c) Vehicles (d) Solvent (e) Drier (f) Pigment and their uses
16. Paint failures such as wrinkling, runs or sags, blistering, bleeding and reasons their of causes and remedies .
17. Knowledge in various colour codes, I.S.I. and International Standards. Standard specification of paints as per I.S.I. Norms.
18. application technique of paints in various types of surface including irregular surface like brushing, rolling, spraying, dipping etc.- brief description. A comparison of deferent painting system.
19. Physical properties of paints and varnishes- viscosity, flashpoint, film thickness, spreading time, drying interval , curing time etc.- their definition and brief description.
20. Primer, under coating, finishing- basic principles and their importance.
21. Utility and importance of staging scaffolding and rigging practice use of leaders, cradles etc.
22. Modern development in the trade- new technique and process.
23. Introduction to work simplification- job study, job analysis including planning sequence of operation. Critical approach and method of working. Estimation of time and material.
24. quality and finish of work- importance of quality and finish of job at all stage- protection of finished surfaces. Economical use of material.  
The importance of application controls and use of proper system and ancillaries for best results.

Total period of instruction for

Trade Theory subject for Third Year ..... 150 hrs.

II. WORK SHOP CALCULATION & SCIENCE ( 1 Hour per week or 50 hours per year approximately.)

1. Revision of previous two years work.
  2. problems connected with estimation of time and materials.
  3. Further problems as applicable to the trade.
  4. For their problems on menstruation, work, power and energy.
  5. Descriptive explanation of expansion of solids, liquid and gases due to heat- coefficient of expansion. Brief description of transference of heat- conduction, convection & radiation .
  6. Heat and temperature. Thermometric scales- Fahrenheit and centigrade- conversion of Fahrenheit scale to centigrade scale and vice-verse. Measurement of temperature. Name and brief description of simple temperature measuring instrument used in the workshop.
  7. S.I. Units- basic, derived and supplementary units.
- Total period of instruction for workshop  
Calculation & Science for Third Year.....50 hrs.

III. ENGINEERING DRAWING (Two hours per week or 100 hours per year approximately.)

1. Revision of previous two years work.
2. Advance blue print reading.
3. Code of practice for general engineering drawing according to I.S.I. ( IS: 696-1960.)
4. Freehand- hand sketching of actual parts of the equipment related to the trade.
5. Isometric drawing of simple objects.
6. Freehand sketching and preparation of lay out drawings and composition along with lettering and typography.

Total period of instruction for

Engineering Drawing for Third Year .....100 hrs.

IV. SOCIAL STUDIES (1 Hour per week or 50 hrs per Year approximately)

The syllabus has already been approved is same for all the trades.

LIST OF TOOLS AND EQUIPMENT FOR FIRST AND SECOND YEAR

The list of tools and equipment for 1<sup>st</sup> & 2<sup>nd</sup> year is same as that for the Trade of painter (g) under crafts men training scheme.

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