

CURRICULUM

FOR THE TRADE OF

Plumber

UNDER

DUAL TRAINING SCHEME

2017

BY



GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

PROPOSED TIME DISTRIBUTION FOR PLUMBER TRADE UNDER

DUAL TRAINING SCHEME

BLOCK WITH DURATION	THEORY	PRAC.	WSC/ CAL	ENGG. DRG.	EMP. SKILL	ECA, LIB. & OTHERS	REM.
BLOCK – I (05months/ 22 Weeks duration) Institute level trg.	230hrs.	300 hrs.	80 hrs.	120 hrs.	100hr s.	10 hrs.	40 hrs. Revision & Test
BLOCK – II (05months / 22 weeks duration) Industry level trg.	---	880hrs.	---	---	---	---	---
BLOCK – III (2 months/ 8 Weeks duration) Institute level trg.	90 hrs.	114 hrs. (Practical practice and submission of report related to industry training)	30hrs.	30hrs.	10 hrs.	06 hrs.	Last 1 week revision & exam.
GRAND TOTAL	320hrs.	1294hrs.	110 hrs.	150 hrs.	110 hrs.	16hrs.	80 hrs.
Total duration of training inclusive of Industry & Institute is 1 years (2080 hrs.)							

GENERAL INFORMATION

- 1. Name of the Trade** : Plumber (**Dual Mode**)
- 2. N.C.O. Code No.** : 7126.0101
- 3. Duration of Craftsmen Training** : 12 months (Three Blocks).
- 4. Power norms** : 1 KW Classroom/ 2 KW Workshop
- 5. Space norms** : 80 Sqm
- 6. Entry Qualification** : 10th Passed
- 7. Unit size (No. of student)** : 20
- 8. Instructor's qualification** :

(A) Essential (any one of the below)

(i) NTC/NAC with Three years Experience in relevant field with Craft Instructors Training Certificate.

(ii) Degree/Diploma in Civil/Mechanical with one or 2 years experience in relevant field.

(B) Desirable qualification: Passed National Craft Instructors Training.

Note:

- (i) Out of two Instructors required for the unit of 1+1, one must have Degree/Diploma and other must have NTC/NAC qualifications.
- (ii) Instructor qualification for W/shop Calculation, Engg Drawing & Employability Skill would be as per the training manual.

Distribution of training on Hourly basis:

Total hours /week	Trade practical	Trade theory	Work shop Cal. & Sc.	Engg. Drawing	Employability skills	Extra curricular activity
40 Hours	25 Hours	6 Hours	2 Hours	3 Hours	2 Hours	2 Hours

SYLLABUS CONTENT WITH TIME STRUCTURE FOR PLUMBER TRADE

Block – I

Duration- 05 Months (22 weeks /880Hrs.)

Institute Level Training: -

Sl. No.	Practical Duration: - 300 hrs.	Theory Duration: - 230 hrs.
1.	<p>INDUCTION TRAINING:</p> <ul style="list-style-type: none"> •Familiarization with the institute. •Importance of trade training. -Machinery used in the type of work done by trainees in the institute. •Type of jobs made by the trainees in the trade. 	<ul style="list-style-type: none"> •Importance of safety and general precautions required for the trade. • Importance of the trade, •Types of work to be done by trainees in the institute. •Scope of a plumbing work. •Types of services has to plan. •Basic Bench fitting
2.	<ul style="list-style-type: none"> • Fitter’s hand tools: - Use of steel rules, engineers square, Scriber and dividers for marking out from drawing. •Technique of handling properly the various Fitter's hand tools: hacksaw, centre punch, chisels, hammer, calipers, different files, bench vice and hand vice, taps . 	<ul style="list-style-type: none"> • Introduction to safety; Equipment including fire fighting and their uses. •Fitter's common hand tools - names, description and material from which they are made. •Description simple fitting operation. Filing and types of files, Marking Instruments and their use. hammers & cold chisels, cutting tools
3.	<ul style="list-style-type: none"> •Chipping by hammer and chisel, grinding of chisel, Cold chisel , round nose chisel, hacksaw, centre punch. •Filing a job flat and square, drilling holes Drilling, tapping. • Threading on pipes. •Making of studs and bolts. •Different types of Files & filing to line. • Filing a job flat and square. •Use of various locking devices. Fastening devices •fixing of mating pairs, check nut, locking pins. •Practicing chipping operation. 	<ul style="list-style-type: none"> •Description of simple fitting Operations hack sawing, punching and filing •Types of files used commonly, •Marking Instruments and their use. •Description of simple drilling machine. •Method of using drills taps and dies. •Description of simple bench drilling machine. •Description of different types of locking and fastening devices.
4.	<ul style="list-style-type: none"> • Soldering copper pipe by using of Soldering iron, with different angle and tee 	<ul style="list-style-type: none"> • Description and uses of soldering iron and blow lamp, • Explain about how to do soldering. • Solder wire, Types of soldering fluxes, blowlamp, soldering iron • Precautions to be observed. • Hard &soft solders -their properties, composition and uses.
5.	<ul style="list-style-type: none"> • Demonstration and uses of Carpenter's hand tools involving sawing, planning, chiseling and making simple joints. 	<ul style="list-style-type: none"> • Description and uses of Carpenter's hand tools used for simple operations such as marking, sawing- planning and making simple joints. • Common types of wood- their description and use

6.	<ul style="list-style-type: none"> •Use of mason hand tools: Straight edge spirit level, plumb bob, square, etc. •Preparation of lime & cement mortars in different proportions to suit various purposes. • Elementary brick work such as construction of gully trap, inspection chamber & manhole of any convenient size. • Forming, benching and channeling and • Plastering the walls. • Cutting of wall with Masonry electric cutting tools. • Repairing damaged portion of the wall and flooring 	<p>Masons hand tools:</p> <ul style="list-style-type: none"> •Names, description and their uses. -Method of making holes in walls and floors. •Concept of bricks, lime and cement. •Preparation of mortars with various materials of varying composition. •Common brick joints. •Description of bonds, •Scaffolding Plastering. •Method of construction of manhole etc. •Plain cement concrete, RCC and its proportion, •Grades of coarse aggregate and fine aggregate, • Knowledge of waterproofing compound
7.	<ul style="list-style-type: none"> •Use and care of the plumber's tools and equipments. •Cutting of pipes of different metals of different dimensions and sizes. •Bending of copper tubes of light gauges. •Bending of mild steel pipes and tubes and PVC pipes •Bending method: •Practice on cutting pipe at different angles for different joints. •Bending of heavy weight mild Steel and galvanized pipes up to 50 mm dia. •Fixing of different pipe accessories such as bends flanges, tees, elbows, sockets, cocks and valves, •Making of simple joints for different purposes using above. •Socket joint of cast iron pipes with lead 	<ul style="list-style-type: none"> •Identify plumbing services required for each type of building according to usage. •Description of plumber tools and Equipments, ratchet, brace, threading die, pipe wrench, sliding wrench, spanner set, chain wrench etc. and their safety. •Plumbing Symbols. •Care & use of tools. •Pipes different kinds. •Pipe fitting -bends, elbows, sockets, tees, unions etc. •their description, specification and use. •Types of fittings for different joints & different pipes, •Description of pipe fittings. •Methods of joining and their uses. •Precautions to be taken while fixing.
8.	<ul style="list-style-type: none"> •Water distribution system. •Fixing of floor traps in kitchen and bath. •Steps of simple pipe connection 	<p>Composition of water:</p> <ul style="list-style-type: none"> •Hard & Soft water, temporary hardness & permanent hardness. Action of water on lead-water softness-tests for water - static water pressures and •Measurement of pressures. Bursting pressure, •Expansion of water on freezing and heating. •Bernoulli's principles •Pascal's law •Pressure of water on the sides of cistern or tank. •Water hammer in pipes.
9.	<ul style="list-style-type: none"> •PVC welding •PPR pipe welding joint 	<ul style="list-style-type: none"> • Equipments and tools for hot gas welding and electric hot plate for PPR pipe Joints
10.	<ul style="list-style-type: none"> • Practice on cutting & shaping P.V.C pipes to sizes. • Use & fixing of P.V.C, pipe fittings • Preparation of P.V.C. pipe joints. • Layout of P.V.C. pipe according to 	<ul style="list-style-type: none"> • Water purification stages and methods • Impurities of water - organic and Inorganic impurities • Sources of water • Different kinds of joints in joining pipes-

	<p>drawing,</p> <ul style="list-style-type: none"> • P.V.C. Description, Properties & use in plumbing work. Method of cutting & preparing joints, • PVC fittings their description & use, • Method of Faying out PVC pipe. 	GI,PVC/CPVC and HDPE etc.
11.	<ul style="list-style-type: none"> • Installation of electrical pump, Suction Valve, Delivery Valve, Foot valve and pipe fitting. • Laying out with bolting on Foundation 	<ul style="list-style-type: none"> • Water supply system of small towns. • Description of pump of various types • Centrifugal pump and it's principle, Mono type, Hydro- pneumatic (buster) pump • Layout of Submergible Pump.
12.	<ul style="list-style-type: none"> • Installation of Indian and European water closet with flushing cistern, flush pipe connection etc. • Difference between 'P' trap water closet and 'S' trap water closet 	<ul style="list-style-type: none"> • Description of Indian and European water closet. • Construction and working principle of Flushing cistern • Precaution to be observed while installing.
13.	<ul style="list-style-type: none"> • Installation Of Diverter with concealed pipe, • Fixing Spout and hand shower, hand shower bracket • Installation Of Wall mixer with head shower • Fix hot and cold water outlet with spirit level. 	<ul style="list-style-type: none"> • Description of diverter, wall mixer, hand shower and spout • Layout of wall mixer and head shower • Precaution to be observed while Installing wall mixer
14.	<ul style="list-style-type: none"> • Installation Of Wash basin along with pillar cock and fixing waste coupling, Bottle trap and drainage outline. • Use a spirit level and measuring tape while Installation Of Wash basin 	<ul style="list-style-type: none"> • Description of pillar cock, Bottle trap and other material • Tools are used while Installing Wash basin.
15.	<ul style="list-style-type: none"> • Installation of urinal, angel valve connecter pipe and spreader, waste coupling, bottle trap and waste pipe. • Fixing urinal sensor and solenoid valve. 	<ul style="list-style-type: none"> • Description of Urinal fittings • Precautions to be taken while fixing Urinal • Working Principle of Solenoid valve and urinal sensor
16.	<ul style="list-style-type: none"> • Installation of digital basin cock ,Solenoid valve, battery box with battery. 	<ul style="list-style-type: none"> • Description of digital basin, • Working Principle and it's construction and layout. • Battery Replacement.
17.	Project work	
18.	<ul style="list-style-type: none"> • Tracing out leakages in pipes, Fittings and Faucets. • Remove Faucets. Open repair and refit again. • Remove fittings and replace it • Remove pipe and replace it. 	<ul style="list-style-type: none"> • Fault find out method
19.	Revision	
20.	Examination	

NOTE: - Maximum uses of video demonstration and other IT based teaching aids may be adopted to deliver the theoretical knowledge.

Syllabus for

EMPLOYABILITY SKILLS

GENERAL INFORMATION
(Employability Skill)

1. **Name of the subject** : **EMPLOYABILITY SKILLS**
2. **Hours of Instruction** : 110 Hrs.
3. **Examination** : The examination will be held at the end of the training.

4. **Instructor Qualification:**

MBA OR BBA with two years experience OR Graduate in Sociology/ Social Welfare/ Economics with Two years experience OR Graduate/ Diploma with Two years experience and trained in Employability Skills from DGET institutes

AND

Must have studied English/ Communication Skills and Basic Computer at 12th/ Diploma level and above.

OR

Existing Social Studies Instructors duly trained in Employability Skills from DGET institutes

5. **Instructor:**

One full time regular instructor shall be engaged on every 240 numbers of trainees for teaching the subject "Employability Skills". One additional full time regular instructor would be required on increase in every 240 trainees. Wherever the trainees are less than 240 or part thereof, a part-time instructor may be engaged to teach the subject.

ALLOTMENT OF TIME AND MARKS AMONG THE TOPICS

Sl. No.	Topics	Allotted Hours	Marks Allotted	To be covered in
1.	English Literacy	20 hrs.	9	Block - I
2.	I.T. Literacy	20 hrs.	9	
3.	Communication Skills	15 hrs.	7	
	SUB TOTAL:	55	25	
4.	Entrepreneurship Skills	15 hrs.	6	
5.	Productivity	10 hrs.	5	
6.	Occupational safety , health and Environment Education	15 hrs.	6	
7.	Labour Welfare Legislation	05 hrs.	3	
8.	Quality Tools	10 hrs.	5	
	Sub Total:	55	25	
	TOTAL	110 hrs.	50	

Introduction to Communication Skills	Communication and its importance
	Principles of Effective communication
	Types of communication - verbal, non verbal, written, email, talking on phone.
	Non verbal communication -characteristics, components-Para-language
	Body - language
	Barriers to communication and dealing with barriers.
	Handling nervousness/ discomfort.
Listening Skills	Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening.
	Triple- A Listening - Attitude, Attention & Adjustment.
	Active Listening Skills.
Motivational Training	Characteristics Essential to Achieving Success
	The Power of Positive Attitude
	Self awareness
	Importance of Commitment
	Ethics and Values
	Ways to Motivate Oneself
	Personal Goal setting and Employability Planning.
Facing Interviews	Manners, Etiquettes, Dress code for an interview
	Do's & Don'ts for an interview
Behavioral Skills	Problem Solving
	Confidence Building
	Attitude
4. Entrepreneurship Skills	
Hour of Instruction: 15 Hrs. Marks Allotted: 06	
Concept of Entrepreneurship	Entrepreneur - Entrepreneurship - Enterprises:- Conceptual issue
	Entrepreneurship vs. management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.
Project Preparation & Marketing analysis	Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.
Institutions Support	Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes& procedure & the available scheme.
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.

Tools & Equipments for Employability Skills:

Sl. No.	Name of the Equipment	Quantity
1	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software	10 nos.
2	UPS - 500Va	10 nos.
3	Scanner cum Printer	1 no.
4	Computer Tables	10 nos.
5	Computer Chairs	20 nos.
6	LCD Projector	1 no.
7	White Board 1200mm x 900mm	1 no.

* **Note:** Above Tools & Equipments not required, if Computer LAB is available in the institute.

Syllabus for

ENGINEERING DRAWING

GENERAL INFORMATION
(Engineering Drawing)

- 1. Name of the Subject** : **ENGINEERING DRAWING**
- 2. Hours of Instruction** : **150 hrs.**
- 3. Instructor Qualification** : Degree in Engineering with one year experience
OR
Diploma in Engineering with two years experience
OR
NCVT / NAC in the Draughtsman (Mechanical / Civil) with three years experience.
- 4. Desirable** : Craft Instructor Certificate in RoD & A course under NCVT.
- 5. Instructor** : One full time instructor is required for 144 Engineering seats sanctioned in the institute. Additional instructor will be required on increase in every 144 students.
- For seats less than 144, the instructor may be out sourced/ hired on contract basis.

Details of syllabus

Sl. No.	Topics (Total duration – 150 hrs.)
1.	Introduction to Engineering Drawing and Drawing Instruments : <ul style="list-style-type: none"> - Conventions - Viewing of engineering drawing sheets. - Method of Folding of printed Drawing Sheet as per BIS SP:46-2003 - Drawing board, T-Square, Drafter (Drafting M/c), Set Squares, Protractor, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), Pencils of different Grades, Drawing pins / Clips.
2.	Lines : <ul style="list-style-type: none"> - Definition, types and applications in Drawing as per BIS SP:46-2003 - Classification of lines (Hidden, centre, construction, Extension, Dimension, Section) - Drawing lines of given length (Straight, curved) - Drawing of parallel lines, perpendicular line - Methods of Division of line segment
3.	Free hand drawing of <ul style="list-style-type: none"> - Lines, polygons, ellipse, etc. - geometrical figures and blocks with dimension Transferring measurement from the given object to the free hand sketches.
4.	Lettering and Numbering as per BIS SP46-2003: <ul style="list-style-type: none"> - Single Stroke, Double Stroke, inclined,
5.	Drawing of Geometrical Figures: Definition, nomenclature and practice of <ul style="list-style-type: none"> - Angle: Measurement and its types, method of bisecting. - Triangle -different types - Rectangle, Square, Rhombus, Parallelogram. - Circle and its elements.
6.	Sizes and Layout of Drawing Sheets <ul style="list-style-type: none"> - Selection of sizes - Title Block, its position and content - Item Reference on Drawing Sheet (Item List)
7.	Method of presentation of Engineering Drawing <ul style="list-style-type: none"> - Pictorial View - Orthographic View - Isometric view
8.	Symbolic Representation used in the related trade (as per BIS SP:46-2003) of : <ul style="list-style-type: none"> - Fastener (Rivets, Bolts and Nuts) - Bars and profile sections - Weld, brazed and soldered joints. - Electrical and electronics element - Piping joints and fittings
9.	Dimensioning practice: <ul style="list-style-type: none"> - Position of dimensioning (unidirectional, aligned, as per BIS SP:46-2003) - Types of arrowhead - Leader Line with text - Symbols preceding the value of dimension and dimensional tolerance.

10.	- Drawing of Solid figures (Cube, Cuboids, Cone) with dimensions.
11.	Free hand Drawing of Solid figures (Prism, Pyramid, Frustum of Cone and Pyramid.) with dimensions.
12.	Free Hand sketch of hand tools and measuring tools used in respective trades.
13.	Projections: <ul style="list-style-type: none"> - Concept of axes plane and quadrant. - Orthographic projections - Method of first angle and third angle projections (definition and difference) - Symbol of 1st angle and 3rd angle projection as per IS specification.
14.	Drawing of Orthographic projection in 3 rd angle.
15.	Free hand Drawing of simple fastener (Rivet, Bolts, Nuts & Screw)
16.	Free hand sketching of simple objects related to trade.
17.	Reading of fabricated engineering drawing

LIST OF TOOLS & EQUIPMENTS

Sl. No.	NAME OF TOOLS / EQUIPMENTS	QUANTITY
1.	Drawing Board	20 Nos
2.	Models : Solid & cut section	as required
3.	Table for trainees	20 Nos
4.	Stool for trainees	20 Nos
5.	Cupboard (big)	01 No
6.	White Board (size: 8ft. x 4ft.)	01 No
7.	Trainer's Table	01 No
8.	Trainer's Chair	01 No

Syllabus for

Workshop Calculation & Science

GENERAL INFORMATION
(Workshop Calculation & Science)

1. **Name of the subject** : WORKSHOP CALCULATION & SCIENCE
2. **Hours of Instruction** : 110 hrs.
3. **Examination** : The examination for the subject will be held at the end of training.
4. **Instructor Qualification** : Degree in Engineering with one year experience
OR
Diploma in Engineering with two years experience
5. **Desirable** : Craft Instructor Certificate in RoD& A course under NCVT.
6. **Instructor** : One full time instructor is required for 144 Engineering seats sanctioned in the institute. Additional instructor will be required on increase in every 144 students.

For seats less than 144, the instructor may be out sourced/ hired on contract basis.

SYLLABUS FOR WORKSHOP CALCULATION AND SCIENCE

(Total Duration - 110 hrs.)

Topic No	Workshop Calculation	Workshop Science
1.	<p>Unit: Systems of unit- FPS, CGS, MKS/SI unit, Unit of length, Mass and time. Conversion of units.</p>	<p>Material Science : Definition, properties (physical & mechanical) and uses of Metal, Non-metal, Alloy & Insulator. Types of ferrous and Non-ferrous metals. Difference between Ferrous and Non-Ferrous metals.</p>
2.	<p>Basic Mathematics - BODMAS rule Fraction-Addition, Subtraction, multiplication and Division-Problem solving, Decimal-Addition. Simple calculation using Scientific Calculator.</p>	<p>Mass, Weight and Density: Mass, Unit of Mass, Weight, difference between mass and weight. Density, unit of density. Relation between mass, weight & density. Simple problems related to mass, weight, and density.</p>
3.	Conversion of Fraction to Decimal and vice-versa.	
4.	Ratio & Proportion: Simple calculations & related problems solving.	
5.	<p>Percentage: Introduction, Simple calculation. Changing percentage to fraction and decimal & vice-versa.</p>	
6.	<p>Basic Algebra: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).</p>	<p>Elasticity: Elastic & Plastic material. Stress & strain and their units. Young's modulus. Ultimate stress and breaking stress.</p>
7.	<p>Mensuration : Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle, Volume of solids – cube, cuboid, cylinder and Sphere. Surface area of solids – cube, cuboid, cylinder and Sphere.</p>	<p>Heat & Temperature: Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, Scale of temperature, relation between different scale of temperature. Thermometer, pyrometer. Transmission of heat, conduction, convection, radiation.</p>

8.		Basic Electricity: Introduction and use of Electricity. AC, DC & their comparisons. Current, Voltage, Resistance & their units. Power, Energy & their units. Insulator and conductors & their uses.

BLOCK – II

DURATION: 05MONTHS (22 weeks)

Industry level training

DETAILS OF PRACTICAL SKILLS TO BE COVERED DURING INDUSTRY TRAINING FOR PLUMBER TRADE

Duration of training: - 05 Months

Actual training will depend on the existing facilities available in the establishments.

The candidate should be competent to execute following operation/ skills after completion of the industrial training: -

1. Maintains and repairs general plumbing components to include toilets, urinals, mechanical & electronics faucets, hose bibbs, exposed & concealed cistern, single lever diverter ,thermostatic diverter, and drains. Install pipe assemblies, fittings, valves, appliances such as dishwashers or water heaters, or fixtures such as sinks or toilets, using hand or power tools. Maintain or repair plumbing by replacing defective washers, replacing or mending broken pipes, or opening clogged drains
2. Installs, repairs, or replaces domestic hot and cold water lines.
3. Repairs and replaces steam to hot water exchangers for major building heating systems and pools. Inspect structures to assess material or equipment needs, to establish the sequence of pipe installations, or to plan installation around obstructions such as electrical wiring.
4. Repairs and replaces domestic hot water heat pumps, chilled water pumps, sump pumps, and sewage pumps.
5. Identify, Install, tests, and repairs all sizes of backflow prevention devices. Work on energy or water saving products, such as low-flow faucets or shower heads, water-saving toilets, or high-efficiency hot water heaters
6. Leads troubleshooting efforts and repairs steam, water, and gas distribution systems. In coordination with Supervisor, assigns to and tracks corrective and preventive maintenance tasks.
7. Ensures proper care in the use and maintenance of equipment and supplies; promotes continuous improvement of workplace safety and environmental practices.
8. Provides sketches and dimensions used by drafters to create plans for subcontractor work. Interprets and applies mechanical and structural blueprints to plan plumbing repairs and modifications..
9. Cut openings in structures to accommodate pipes or pipe fittings, using hand or power tools. Measure, cut, thread, or bend pipe to required angle, using hand or power tools or machines such as pipe cutters, pipe-threading machines, or pipe-bending machines.
10. Assemble pipe sections, tubing, or fittings, using couplings, clamps, screws, bolts, cement, plastic solvent, caulking, or soldering, brazing, or welding equipment.
11. Locate and mark the position of pipe installations, connections, passage holes, or fixtures in structures, using measuring instruments such as tapes, rulers or levels.

12. Fill pipes or plumbing fixtures with water or air and observe pressure gauges to detect and locate leaks.
13. Install underground storm, sanitary, or water piping systems, extending piping as needed to connect fixtures and plumbing.
14. Install green plumbing equipment, such as faucet flow restrictors, dual-flush or pressure-assisted flush toilets, or tankless hot water heaters.
15. Perform domestic plumbing audits to identify ways in which customers might reduce consumption of water or energy.
16. Install alternative water sources, such as rainwater harvesting systems or gray water reuse systems.
17. Install, test, or commission solar thermal or solar photovoltaic hot water heating systems.
18. Performs miscellaneous job-related duties as assigned at the site.

NOTE: -

1. In addition to the above mentioned skills/ operations industry may impart training on any other skills/ operations related to the trade.
2. Assignment should be planned so that the trainees may spend 20% of the total time of production/service type of work (using gauges, templates, fixture etc.) for developing their skill and confidence about manufacturing which will help ever in self- employment, if found necessary in the future.

BLOCK – III

DURATION: 2 Months (08 Weeks)

Institute level training

For last two months candidates will be engaged in following works: -

1. Revision of theoretical components covered during Block – I.
2. Practical practice and project report submission.
3. Preparing candidate to face interview, preparation of bio-data, awareness about different jobs in the related field and grooming to be an entrepreneur.
4. Self study and final AITT examination.

Note:-

1. The training may be conducted in Block mode i.e. few months in ITI & few in Industry.
2. The training may be conducted in flexible mode i.e. few days of a week in ITI & few days in Industry.
3. Five months industrial training is mandatory.
4. Last two months of training in ITI is mandatory.
5. No admission of trainees without signing MOU with industry by the Institute (ITI).
6. To sign MOU with ITI, industry must ensure that, training facility is available to impart all skill sets as indicated in Block-II. Industry should make arrangements to provide all the Skill set as in Block-II for the trade in the Industry either by itself or through its ancillary units or in association with some other Industries.
7. If the industry ensures delivery of skill training as per Sl. 6 then 2nd MOU is not necessary.
8. However, Industry should ensure 100% skill training indicated in Block-II & necessary arrangement to be made to cover training on rest skill set (beyond the % indicated in sl.6) in collaboration with any other related industries. Extensive use of E-learning process may also be adopted.

TRADE: PLUMBER (Dual mode)

LIST OF TOOLS & EQUIPMENT FOR 20 TRAINEES

A: Students Tool Box: -

Sl. No.	Name of the items	Quantity
1	Steel rule 300 mm. both in inch and mm.	21 Nos.
2	Rule wooden 4 fold 600 mm.	21 Nos.
3	Hacksaw frame adjustable for 300 mm	21 Nos.
4	Scriber 200 mm.	21 Nos.
5	Centre Punch 100 mm.	21 Nos.
6	Chisel, cold, flat 20x250 mm.	21 Nos.
7	Hammer ball pein 800 gms.	21 Nos.
8	Hammer ball pein 300 gms.	21 Nos.
9	File flat rough 300 mm.	21 Nos.
10	Level spirit wooden 300 mm.	21 Nos.
11	Plumb bob 50 gms.	21 Nos.
12	Trowel 125 IS: 6013	21 Nos.
13	Stillson wrench 300 mm.	21 Nos.
14	Screw driver 250 mm.	21 Nos.
15	Wooden mallet small IS: 2022	21 Nos.
16	Cutting Pliers 200 mm. IS: 3650	21 Nos.
17	Steel Tape 3meter	21 Nos.

B: Tools and equipment for practical and display board

Sl. No.	Name and Description of Tools	Quantity
1	Hand Vice Jaw 50 mm.	1 no
2	File flat smooth 150 mm.	1 no
3	File half round rough 150 mm.	1 no
4	File square smooth 150 mm.	1 no
5	File triangular rough 150 mm.	1 no
6	File flat rasp 200 mm.	20 nos.
7	File triangular smooth 150 mm.	1 no
8	Chisel cold flat 20 mm. x 300 mm.	2 nos.
9	Chisel cross cut 6 x 150mm IS: 402	1 no
10	Chisel round nose 3 x 150 mm IS: 402	1 no
11	Chisel diamond point 6 x 150 mm	1 no
12	BSP Tap ½", ¾" & 1"	1 set
13	Pipe die set ½", ¾" & 1"	1 set
14	Ratchet pipe die ½", ¾", 1"	1 set
15	Punch letter set	1 set
16	Punch number set	1 set
17	Water pump plier 250mm (groove type)	2 nos.
18	Adjustable spanner 205mm	2 nos.
19	Pliers combination 200 mm	2 nos.
20	Hacksaw frame adjustable for 300 mm	2 nos
21	Adjustable iron jack plane 50mm cutter 250mm long	4 nos
22	Oil stone 150 mm x 50 mm x 25 mm	1 no
23	Snip straight 300 mm.	1 no

24	Try square 200 mm	4 nos.
25	Inside calliper 150 mm	1 no
26	Outside caliper 150 mm	1 no
27	Odd leg calliper 150 mm	1 no
28	Divider 150 mm	1 no
29	Mallet medium IS: 2922	1 no
30	Butane gas cylinder 225 gms with blowpipe	4 nos.
31	Solder wire 3 mm	½ KG
32	Soldering paste (la-co)	½ KG
33	Open and Ring Spanner 6 to 27mm	1 set
34	Vice grip pliers 250mm	8 nos.
35	Pipe wrenches 350 mm	6 nos.
36	Pipe wrenches 450 mm	2 nos.
37	Chain pipe wrench 15mm -90mm	1 no.
38	Hand drill machine impact drill 230V, 500W 10mm	1 no.
39	Drill twist (Straight shank) 3,4, 5, 6, 8, 10mm	1 set
40	Boiler 15litres (horizontal)	2 nos
41	Geyser	2 nos
42	Wash basin (16 " x 12 " x 10 ")	2 nos
43	Pedestal Wash basin	1 no.
44	European Water closet 'S' Trap	2 nos
45	European Water closet 'P' Trap	2 nos
46	Water closet Indian type with 'P' Trap	2 nos
47	Anglo Indian water closet with cover	2 nos
48	Lower flush tank	2 nos
49	Urinal	2 nos

50	Water meter ½"	2 nos.
51	Double face hammers (4 Lbs)	2 nos
52	Ball pein Hammer (2 Lbs)	2 nos
53	Pipe cutter ½"-1"	2 nos
54	Copper tube cutter	1 no.
55	Spade, Shawal, Pickax, Trowal, Mortar pan Plumb bob 50 gms, Sprit level, Water level tube.	1 each

C: For lab set up

SI. No.	Name and Description of Tools	Quantity
1	Steel cupboard	4 nos.
2	Working bench 3'x4'(900x1200mm)	2 nos.
3	Working bench 3'x6'(900x1800mm)	2 nos.
4	Surface Plate 400 x 400 mm. Grade 1	1 no.
5	Scribing Block universal 300 mm.	1 no.
6	Pipe vice 2½"	10 nos
7	Pipe vice 4"	1 no
8	Banch vice 4"	2 nos
9	Anvil 50 or 63 kg.	1 no.
10	Pipe bender manually operated	1 no.
11	Bath tub Zakuji	1 no.
12	Metal rack 1800 x 1500 x 450 mm	1 no.
13	Desk for 20 students	1 set
14	Fire extinguisher	1 no.
15	Fire buckets with stand	1 no.

16	PVC welding Machine	1 no.
17	Electric Water pump 1 HP	1 no.
18	Pedestal grinder with two wheels	1 no.
19	Hydraulic pressure machines for testing	1 no.
20	Pipe bender (Hydraulic type)	1 no.
21	Digital Multimeter (3 ½ digit)	2 nos
22	Digital Thermometer	2 nos
23	Instructor's table and chair	1 no.
24	Display board 6' x 4' (plywood)	2 nos
25	Computer	1 no.
26	White board, White board marker, Duster.	1 each

D: Sanitary Wares

Sl. No.	Name and Description of Tools	Quantity
1	Indian Water closet	2 nos.
2	European Water closet P trap with cover	2 nos.
3	European Water closet S trap with cover	2 nos.
4	Wall mounting Water closet with cover	2 nos.
5	Anglo indian water closet with cover	2 nos.
6	Chair Bracket	2 nos.
7	Open Flush tank	2 nos.
8	Concealed Flush tank	2 nos.
9	Wall mounted Wash basin	

NOTE:

1. * Optionally Gas cylinders can also be hired as and when required
2. No additional items are required to be provided for unit or batch working in the Second shift except the items under trainee's tool kit and steel lockers.

Format for Internal Assessment

Name & Address of the Assessor :						Year of Enrollment :								
Name & Address of ITI (Govt./Pvt.) :						Date of Assessment :								
Name & Address of the Industry :						Assessment location: Industry / ITI								
Trade Name :			Block:			Duration of the Trade/course:								
Operation/Skill:														
Sl.No	Maximum Marks (Total 100 Marks)		15	5	10	5	10	10	5	10	15	15	Total internal assessment Marks	Result (Y/N)
	Candidate Name	Father's/Mother's Name	Safety consciousness	Workplace hygiene	Attendance/Punctuality	Ability to follow Manuals/ Written instructions	Application of Knowledge	Skills to handle tools & equipment	Economical use of materials	Speed in doing work	Quality in workmanship	VIVA		
1														
2														

LIST OF TRADE COMMITTEE MEMBERS

Sl. No.	Name & Designation	Organization	Remarks
1.	R. K. Pathak, Director (T)	DGT, MSDE, New Delhi	Chairman
2.	L. K. Mukherjee, DDT	CSTARI, Kolkata	Member
3.	R. N. Manna, Training Officer	CSTARI, Kolkata	Member
4.	Amar G. Prabhu, Principale	Don Bosco ITI, Kurla	Member
5.	Magnesh Ganjale, Sr. Regional Manager	GROHE, Germany	Member
6.	Walter D'mello, Craft Instructor	Don Bosco Grohe Dual Tech. Programme, Kurla	Member
7.	Nelson Fernandez, Proprietor	Nelson Valve Co.	Member
8.	Sharat V. Rao, Chairman	Indian Plumbing Association	Member
9.	Nishita Shah	Manashi Engineering Co.	Member