

PLUMBER

COMPETENCY BASED CURRICULUM

(Duration: 2 Yrs.)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL- 5



India

कौशल भारत - कशल भारत

SECTOR – CONSTRUCTION



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

Plumber

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(Revised in 2018)



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NSQF LEVEL - 5

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Developed By

Ministry of Skill Development and Entrepreneurship
Directorate General of Training
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Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

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1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate(ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry. There are four categories of apprentices namely; **trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

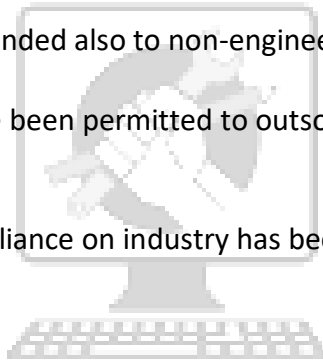
1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

1.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22nd December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.
- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly.



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2.1 GENERAL

Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of NCVT for propagating vocational training.

Plumber trade under ATS is one of the most popular courses delivered nationwide through different industries. The course is of two years (02 Blocks) duration. It mainly consists of Domain area and Core area. In the Domain area Trade Theory & Practical impart professional - skills and knowledge, while Core area - Workshop Calculation and science, Engineering Drawing and Employability Skills imparts requisite core skills & knowledge and life skills. After passing out the training programme, the trainee is being awarded National Apprenticeship Certificate (NAC) by NCVT having worldwide recognition.

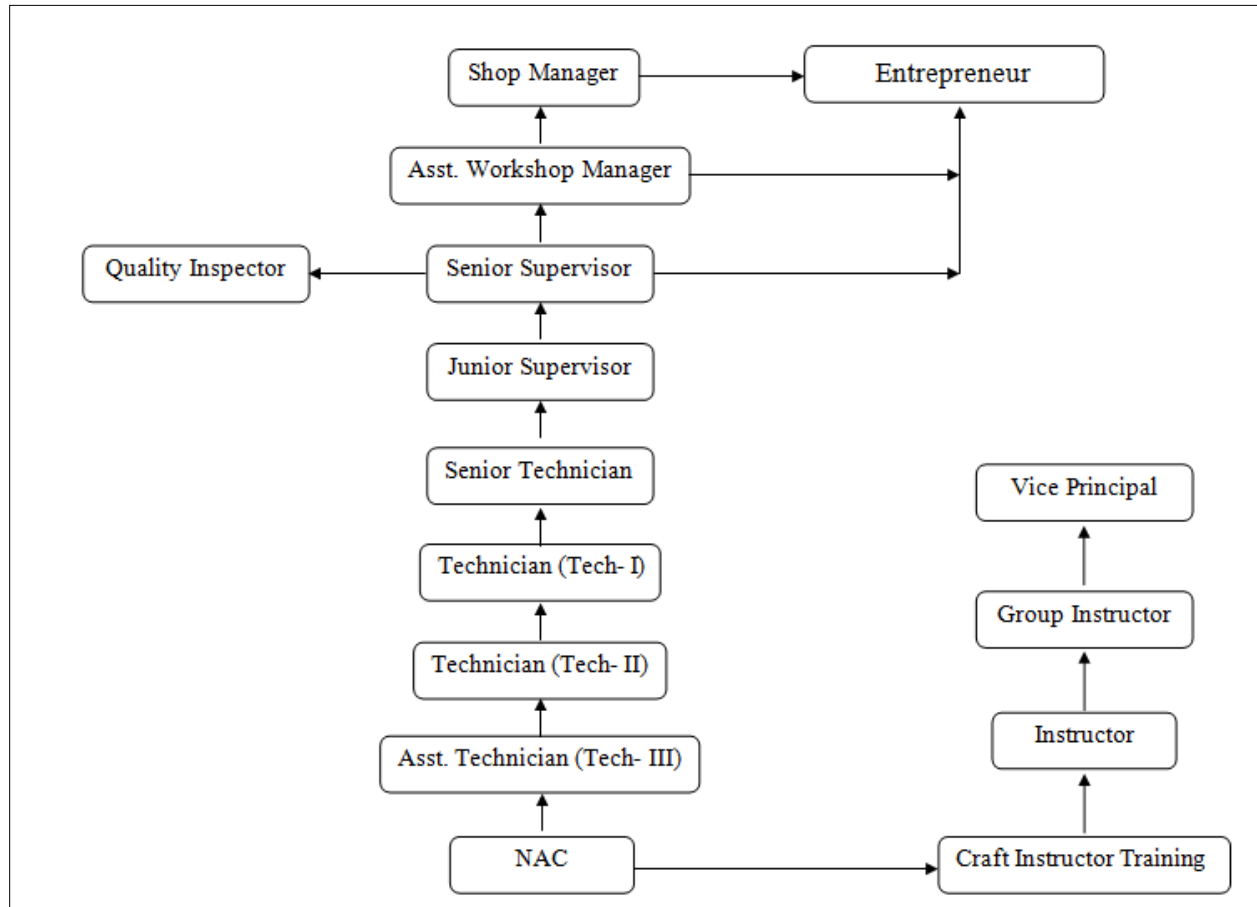
Broadly candidates need to demonstrate that they are able to:

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs and solve problem during execution.
- Check the job/assembly as per drawing for functioning, identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

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2.2 CAREER PROGRESSION PATHWAYS:

- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.
- Indicative pathways for vertical mobility.



2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of two years (*Basic Training and On-Job Training*): -

Total training duration details: -

Time (in months)	1-3	4-12	13-15	16-24
Basic Training	Block – I	-----	Block – II	-----
Practical Training (On - job training)	----	Block – I	-----	Block – II

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A. Basic Training

For 02 yrs. course (Engg.) :-(**Total 06 months:** 03 months in 1styr. + 03 months in 2nd yr.)

For 01 yr. course (Engg.) :-(**Total 03 months:** 03 months in 1st yr.)

S No.	Course Element	Total Notional Training Hours	
		For 02 Yrs. course	For 01 Yr. course
1.	Professional Skill (Trade Practical)	550	275
2.	Professional Knowledge (Trade Theory)	240	120
3.	Workshop Calculation & Science	40	20
4.	Engineering Drawing	60	30
5.	Employability Skills	110	55
	Total (Including internal assessment)	1000	500

B. On-Job Training:-

For 02 yrs. Course (Engg.) :-(**Total 18 months:** 09 months in 1st yr. + 09 months in 2nd yr.)

Notional Training Hours for On-Job Training: 3120 Hrs.

For 01 yr. course (Engg.) :-(**Total 12 months**)

Notional Training Hours for On-Job Training: 2080 Hrs.

C. Total training hours:-

Duration	Basic Training	On-Job Training	Total
For 02 yrs. course (Engg.)	1000 hrs.	3120 hrs.	4120 hrs.
For 01 yr. course (Engg.)	500 hrs.	2080 hrs.	2580 hrs.

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2.4 ASSESSMENT & CERTIFICATION:

The trainee will be tested for his skill, knowledge and attitude during the period of course and at the end of the training programme as notified by Govt of India from time to time. The Employability skills will be tested in first two semesters only.

a) The **Internal assessment** during the period of training will be done by **Formative assessment method** by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NAC will be conducted by NCVT on completion of course as per guideline of Govt of India. The pattern and marking structure is being notified by govt of India from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.**

2.4.1 PASS REGULATION

The minimum pass percent for Practical is 60% & minimum pass percent for Theory subjects 40%. The candidate pass in each subject conducted under all India trade test.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration should be given while assessing for team work, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

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Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

Performance Level	Evidence
(a) Weightage in the range of 60 -75% to be allotted during assessment	
For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.	<ul style="list-style-type: none"> • Demonstration of good skill in the use of hand tools, machine tools and workshop equipment • Below 70% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A fairly good level of neatness and consistency in the finish • Occasional support in completing the project/job.
(b) Weightage in the range of above75% - 90% to be allotted during assessment	
For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.	<ul style="list-style-type: none"> • Good skill levels in the use of hand tools, machine tools and workshop equipment • 70-80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A good level of neatness and consistency in the finish • Little support in completing the project/job
(c) Weightage in the range of above 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	<ul style="list-style-type: none"> • High skill levels in the use of hand tools, machine tools and workshop equipment • Above 80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

Brief description of Job roles:

Plumber is responsible for general supervision, assembles, installs and maintains sanitary fittings and fixtures, sewage and drainage systems, heating and sanitary systems, gas and water pipe lines etc. Receive instructions from Sanitary Engineer or Civil Engineer regarding layout of pipes, gas or water mains, position of fixtures and fittings, etc. Examine drawings or other specifications regarding size and dimensions of area where sanitary fittings or pipe are to be fitted or laid. Mark points at places to indicate position for fixing brackets and laying pipes. Drill passage holes in walls or floor of premises and fixes necessary brackets, stands, holders etc. to keep or hold fittings and fixtures in position, using nuts, bolts, clamps etc. and tightens them with hand tools. Cut reams, threads and bends pipes as appropriate. Ensure that whether pipe lines are laid properly. Join pipes with sockets, Tees, elbow etc. or with molten lead or lead wool. Caulks joints (operation of making joint seam tight to withstand pressure) and tests them for leaks with pneumatic or hydraulic pressure. May repair and maintain sewerage and pipe lines by replacing washers on leaky faucets, mending burst pipes, opening clogged drains, etc. May do lead burning, dressing and bossing of lead pipe and sheet lead, inlaying of wooden tanks, construction of septic tanks etc.

A Plumber is responsible for installation and repair plumbing systems including those of advanced sanitary fixtures as per manufacturer's specifications in housing, commercial and institutional setups. Plumber is an important job role in carrying out installation and repair of sanitary fixtures and fittings in 'contractors' segment.

Plumber can read the Layout drawing, Laying the pipe lines to pass through the various Fluids From reservoir to consumer point, Majorly we can do various application like installation of valves, pumps, to the water supply system, sanitary fitting, and modern accessories with help of various pipes, fittings, pumps, and accessories, with core skill like Basic Fitting, Basic Carpentry, Basic welding, and Basic masonry,

Personal Attributes: He should be able to work independently on his assignment. He should be comfortable in performing laborious work. He should be a good listener. He should be good at taking and following instructions. He should be a good team player. He should be result oriented and positive in attitude. Plan and organize assigned work and detect & resolve issues during execution. Demonstrate possible solutions and agree tasks within the team. Communicate with required clarity and understand Technical English, sensitive to environment, self-learning and productivity.

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Reference NCO - 2015:

- i) 7126.0101 Plumber, General
- ii) 7126.0103 Plumber, General – Installation and Repair
- iii) 7126.9900 Plumbers and Pipe Fitters, Other



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4. NSQF LEVEL COMPLIANCE

NSQF level for Plumber trade under ATS: **Level 5**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

- a. Process
- b. Professional Knowledge,
- c. Professional Skill,
- d. Core Skill and
- e. Responsibility.



The Broad Learning outcome of **Plumber** trade under ATS mostly matches with the Level descriptor at Level- 5.

The NSQF level-5 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 5	Job that requires well developed skill, with clear choice of procedures in familiar context.	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problem by selecting and applying basic methods, tools, materials and information.	Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication .	Responsibility for own work and Learning and some responsibility for other's works and learning.

5. GENERAL INFORMATION

Name of the Trade	PLUMBER
NCO – 2015	7126.0101 ,7126.0103, 7126.9900
NSQF Level	Level – 5
Duration of Apprenticeship Training (Basic Training + On-Job Training)	Two years (02 Blocks each of one year duration).
Duration of Basic Training	a) Block –I : 3 months b) Block – II : 3 months Total duration of Basic Training: 6 months
Duration of On-Job Training	a) Block–I: 9 months b) Block–II : 9 months Total duration of Practical Training: 18 months
Entry Qualification	Passed 10 th Class with Science and Mathematics under system of Education or its equivalent
Selection of Apprenticeship	The apprentices will be selected as per Apprenticeship Act amended time to time.
Instructors Qualification for Basic Training	As per ITI instructors qualifications as amended time to time for the specific trade.
Infrastructure for Basic Training	As per related trade of ITI.
Examination	The internal examination/ assessment will be held on completion of each block. Final examination for all subjects will be held at the end of course and same will be conducted by NCVT.
Rebate to Ex-ITI Trainees	01 year
CTS trades eligible for Plumber Apprenticeship	Plumber

Note:

- Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.
- For imparting Basic Training the industry to tie-up with ITIs having such specific trade and affiliated to NCVT.

6.1 GENERIC LEARNING OUTCOME

The following are minimum broad Common Occupational Skills/ Generic Learning Outcome after completion of the Plumber course of 02 years duration under ATS.

Block I & II:-

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Understand and explain different mathematical calculation & science in the field of study including basic electrical. *[Different mathematical calculation & science –Units and measurements Material science, ratio and Proportion, Friction, Centre of gravity, Specific Gravity, pressure, Work, Power & Energy, Algebra, Geometry & Mensuration , Volume, weight, Estimation, Applied shop problems , Estimation of Lay out and Installation piping system ,Heat & Temperature, Levers & Simple machine, Reading of graph, Statistics, Centre of gravity, Power transmission, Pressure]*
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol ,draw the lay out plan, Study the building Drawing about the plumbing sectional views about the Drains]*
4. Select and ascertain measuring instrument and measure dimension of components and record data.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
8. Plan and organize the work related to the occupation.

6.2 SPECIFIC LEARNING OUTCOME

Block – I

1. Understand and explain to perform out the different type of pipes for measure, mark, cut, file, drill, tap, die, thread, fit, joint and allied operations with clear choice of procedures.
2. Understand and explain to perform out the different types of carpentry work allied operations with clear choice of procedures.
3. Understand and explain to perform out the different types of welding work allied operations with clear choice of procedures.
4. Understand and explain to perform out the different types of masonry work allied operations with clear choice of procedures.
5. Understand and explain to plan, organize the work for different types of pipe cut, bend, lay, install, repair, and maintenance to check for to perform out the different allied operations with clear choice of procedures with result.

Block –II

6. Understand and explain the constructional features of water supply systems for Lay, Branch, Install, Test, Repair and Maintenance and set up different work and tool handle required to accomplish tasks on these work with required alignment and check for accuracy without any assistance.
7. Understand and explain the constructional features of Sanitary Systems and drainage systems for Lay ,Branch, Install ,Test, Repair and Maintenance and set up different work and tool handling required to accomplish tasks on these work with required alignment and check for accuracy without any assistance.
8. Understand and explain the constructional features of home appliance for Lay, Install, Test, Repair and Maintenance and set up different work and tool handling required to accomplish tasks on these work with required alignment and check for accuracy without any assistance.
9. Understand and Practice of Install and repair of different types of Cocks, Valves and pumps.

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10. Understand and Practice of Lay rain water pipes & Cutters, Construction of Rain water harvesting systems.
11. Demonstrate practical skills in water supply systems, sanitary systems, drainage systems, home appliance, different types of cocks, valves , pumps, rain water pipes, cutters , and construction of rain water harvesting systems for prepare tools, materials & equipments, lay, install, test, repair and maintenance.

NOTE: Learning outcomes are reflection of total competencies of a trainee and assessment will be carried out as per assessment criteria.

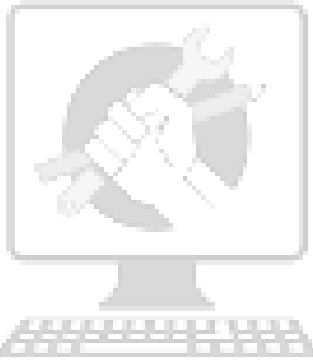


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7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING OUTCOME	
LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1. 1. Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1. 2. Recognize and report all unsafe situations according to site policy.
	1. 3. Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1. 4. Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1. 5. Identify and observe site policies and procedures in regard to illness or accident.
	1. 6. Identify safety alarms accurately.
	1. 7. Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1. 8. Identify and observe site evacuation procedures according to site policy.
	1. 9. Identify Personal Productive Equipment (PPE) and use the same as per related working environment.
	1. 10. Identify basic first aid and use them under different circumstances.
	1. 11. Identify different fire extinguisher and use the same as per requirement.
	1. 12. Identify environmental pollution & contribute to avoidance of same.
	1. 13. Take opportunities to use energy and materials in an environmentally friendly manner
	1. 14. Avoid waste and dispose waste as per procedure
	1. 15. Recognize different components of 5S and apply the same in the working environment.
2. Understand, explain different mathematical calculation & science in the field of study including basic	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.

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<p>electrical and apply in day to day work <i>[Different mathematical calculation & science –Units and measurements Material science, ratio and Proportion ,Friction, Centre of gravity, Specific Gravity, pressure, Work, Power & Energy, Algebra, Geometry & Mensuration, Volume, weight, Estimation ,Applied shop problems , Estimation of Lay out and Installation piping system ,Heat & Temperature, Levers & Simple machine, Reading of graph, Statistics, Centre of gravity, Power transmission, Pressure]</i></p>	2.2 Measure dimensions as per drawing
	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply given tolerance.
	2.5 Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	2.6 Ensure dimensional accuracy of assembly by using different instruments/gauges.
	2.7 Explain basic electricity, insulation & earthing.
	
<p>3. Interpret specifications, different engineering drawing and apply for different application in the field of work. <i>[Different engineering drawing- Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol ,draw the lay out plan, Study the building Drawing about the plumbing sectional views about the Drains]</i></p>	3. 1. Read & interpret the information on drawings and apply in executing practical work.
	3. 2. Read & analyse the specification to ascertain the material requirement, tools, and machining /assembly /maintenance parameters.
	3. 3. Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.

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4. Select and ascertain measuring instrument and measure dimension of components and record data.	4.1 Select appropriate measuring instruments such as micrometers, vernier calipers, dial gauge, bevel protector and height gauge (as per tool list).
	4.2 Ascertain the functionality & correctness of the instrument.
	4.3 Measure dimension of the components & record data to analyse the with given drawing/measurement.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	5.1 Explain the concept of productivity and quality tools and apply during execution of job.
	5.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	5.3 Knows benefits guaranteed under various acts.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid environment pollution.
	6.2 Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	7. 1. Explain personnel finance and entrepreneurship.
	7. 2. Explain 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.
	7. 3. Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and organize the work related to the occupation.	8. 1. Use documents, drawings and recognize hazards in the work site.
	8. 2. Plan workplace/ assembly location with due consideration to operational stipulation
	8. 3. Communicate effectively with others and plan project tasks
	8. 4. Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.

SPECIFIC LEARNING OUTCOME

Block-I & II

*Assessment Criteria i.e. the standard of performance, for each specific learning outcome mentioned under **block – I & block – II**(section: 10) must ensure that the trainee achieves well developed skill with clear choice of procedure in familiar context. Assessment criteria should broadly cover the aspect of **Planning** (Identify, ascertain, estimate etc.); **Execution** (perform, illustration, demonstration etc. by applying 1) a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information 2) Knowledge of facts, principles, processes, and general concepts, in a field of work or study 3)Desired Mathematical Skills and some skill of collecting and organizing information, communication) and **Checking/ Testing** to ensure functionality during the assessment of each outcome. The assessments parameters must also ascertain that the candidate is responsible for own work and learning and some responsibility for other’s work and learning.*

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BASIC TRAINING (Block – I)**Duration: (03) Three Months**

Week No.	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1	INDUCTION TRAINING: <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. Introduction to safety: Equipment including fire fighting and their uses. 	<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&3	<ul style="list-style-type: none"> Use of steel rules, engineers square, Scriber and dividers for marking out from drawing. Technique of handling & use properly the various Fitter's hand tools: hacksaw, centre punch, chisels, hammer, calipers, different files, bench vice and hand vice, taps ,dies and holders. 	<ul style="list-style-type: none"> Fitter's common hand tools - names, description and material from which they are made. Description, types and uses of holding device , hammers & cold chisels, cutting tools
4	<ul style="list-style-type: none"> Making for drilling holes Drilling, tapping and threading on pipes. Use of various locking devices, Fastening devices Demonstration and uses of Carpenter's hand tools involving sawing, planing, chiseling and making simple joints. 	<ul style="list-style-type: none"> Description of simple drilling machine. Method of using drills, taps and dies. Description of simple bench drilling Machine. Description and uses of Carpenter's hand tools used for simple operations such as marking, sawing, planing and making simple joints.
5	<ul style="list-style-type: none"> Threading pipe of various sizes. Fixing of different fittings. Practice of gas welding: <ul style="list-style-type: none"> Joining of pipes of different diameters and thickness by welding. 	Different types of pipes- GI, CI, PVC/CPVC, PPR, AC and HDPE etc. Gas welding : <ul style="list-style-type: none"> Gas purpose Method of gas welding, Safety precautions to be observed -Methods of soldering

Plumber

6	<ul style="list-style-type: none"> • Use of mason hand tools : Straight edge spirit level, plumb bob, square, etc • Setting out work with tape, rule, square, line pin, and level. Cutting bricks and stones to given size and template. 	Masons hand tools: <ul style="list-style-type: none"> • Names, description and their uses. -Method of making holes in walls and floors. • Types of tools used and various Processes.
7&8	<ul style="list-style-type: none"> • Preparation of cement mortars in different, Elementary brick work such as construction of gulley trap, inspection chamber & manhole of any convenient size. • Cutting of wall with Masonry electric / power cutting tools. 	<ul style="list-style-type: none"> • Concept of bricks and cement. Common brick joints. Concept of Scaffolding. • Method of construction of manhole etc.
9&10	<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 mild steel pipes and tubes and PVC pipes • Bending method: • Practice on cutting pipe at different angles for different joints. • steps of simple pipe connection 	<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 water hammer in pipes.
11	<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
12	<ul style="list-style-type: none"> • Layout of P.V.C. pipe according to drawing. • P.V.C. Description, Properties & use in plumbing work. Method of cutting & preparing joints. • P.V.C. fittings their description & use. • Method of laying out PVC pipe. 	<ul style="list-style-type: none"> • Impurities of water – organic and inorganic impurities • Sources of water • Different kinds of joints in joining pipes- GI,PVC/CPVC and HDPE etc.
13	Internal Assessment/Examination 03days	

Note: - More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.

BASIC TRAINING (Block – II)
Duration: (03) Three Months

Week No.	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1.	<ul style="list-style-type: none"> Laying out of hummed and asbestos pipes -according to drawing alignment of pipes and joining them. Repair of leaks. (The pipe of minimum dia. should be used). 	<ul style="list-style-type: none"> Use of hummed and asbestos pipes of different sizes. Method of laying out pipes alignment and joining.
2	<ul style="list-style-type: none"> Joining of pipes with different materials and diameters with various fittings. 	<ul style="list-style-type: none"> Description of various pipe joints- straight, Branch , Taft and blow, Expansion joints. Solders and fluxes used in joints.
3-4	<ul style="list-style-type: none"> Construction of inspection chamber, manholes, gully traps. Testing of drainage lines smoke test, water test, smell test, ball test, mirror test 	<ul style="list-style-type: none"> Inspection chamber, septic tank, description of drains, cess pools, soak pits etc. Types of traps layout of drainage system Method of bending pipes by hot and cold process.
5	<ul style="list-style-type: none"> Tracing out leakages and repairing of water supply system. Removal of air locks. Rain water harvesting system 	<ul style="list-style-type: none"> Method of dismantling and renewal of the valves and pipes. Leaks in pipes and noises in plumbing. Installation of water meters. Air lock in pipes and its removal.
6-7	<ul style="list-style-type: none"> Erecting simple water supply system including Installation of water meter. Branching of pipes. Fixing, testing & repair of Bath tub, wash. basin etc. Erecting rain water and drainage piping system. Installation of sanitary fittings like water closets, urinals 	<ul style="list-style-type: none"> Erecting rain water and drainage pipe system, installation of sanitary fittings, inspection and testing of water supply system. Pipe alignment and slope. - Prevention of water hammer. Storage tanks for general water supply propose. Test for water supply pipes. Description of sanitary fittings, general points to be observed when choosing sanitary fittings.

Plumber

8-9	<ul style="list-style-type: none"> • Fixing of C.I. external water pipe with branch to receive lead waste pipe from bath & wash basin and another branch – lead waste pipe from sink. • Fixing of external soil pipe with sand branch fitted to take lead soil pipe from W.C. • Fixing of rain water gutter, outlet and ground pipe. • Preparation and fixing of lead sink waste. Measurement, preparation and fixing up of lead wastes from wash basin and bath. 	<ul style="list-style-type: none"> • Domestic drainage system: • General layout, • one pipe system, specifications of materials required. • Method of testing leakage. - Different types of traps, ventilation, anti syphonage and sinks.
10-11	<ul style="list-style-type: none"> • Measurement, cutting, preparation and fixing up of rising mains and • Distributing pipes as per layout. • Preparation and fixing of hot and cold services to the bath and wash basin as per layout. • Installation of hot water system. Description of solar water heating system. 	<ul style="list-style-type: none"> • Domestic hot and cold water. • General layout, specification of materials required and • Connection of pipes to mains. • Tracing leakage. • Repairs to service main. • Domestic boilers and Geysers. • Method of ventilating pipe. • Precaution against air Poisoning. • Fixing of solar water system.
12	<ul style="list-style-type: none"> • Cleaning of sanitary installations including pipes. • Scraping and painting of pipes. • Repairing of broken or cracked sanitary fittings. 	<p>Sensor system for urinals and was basin, etc.</p> <p>Corrosion - causes and remedies, prevention.</p> <p>Layout of pipes as per drawing.</p>
13	<p>Revision</p> <p>Internal Assessment</p>	

Note: - More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.

9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

A. Block– I

Topic No.	a) Engineering Drawing	b) Workshop Science & Calculation
1	Use of drawing instruments, T-square & Drg. Board. Free hand sketching of straight line rectangles squares, circles, polygons etc.	Common fraction addition, subtraction, multiplication and division, application of fractions to shop problems CGS and FPS system of units of length, weight, their conversion
2	Free hand sketching with dimension to scale and proportionate sketching.	Proportions and uses of cast iron, wrought iron, plain carbon steel, high speed steel and alloy steel.
3	Simple orthographic projection first angle. Simple orthographic projection third angle.	Applied workshop problems , Identification of elementary properties and uses of copper zinc lead, tin, aluminum, brass, bronze, solder, bearing metals, timber. Asbestos, plastic materials, ceramic, asphalt. conversion of decimals of common fraction. Applies problems.
4	Simple isometric drawings. Isometric views of simple objects such as squares, rectangles, cubes, rectangular blocks etc.	Reduction of common fraction to decimal fractions, shop problems. Metric system, metric measurement & metric units, square root the square root of a perfect square.
5	Conversion of orthographic views of solid objects like cubes, parallel opoids, prisms, conces, cylinders, etc. Into isometric views. Construction of simple figures and solids such as cubes rectangular block cylinders etc.	The square root of a whole number and a decimal, The weight of a body, unit of weight shop problems. Percentage and its application –shop problems.
6		Ratio and proportion, applied problems. Work power, energy, and its unit applied Problems.
7		Definition of friction related terms, terms, different types with examples, meaning of center of gravity example. Specify gravity.

Plumber

8	Mensuration on areas of rectangle, square triangle, circle, regular polygons etc. Calculation of area.
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B. Block- II

Topic No.	Engineering Drawing	Workshop Science & Calculation
1	Lettering number & alphabets. Freehand isometric sketching of simple objects with dimensions.	Calculation of area, calculation of volume and weight of solid bodies such as cubes squares and hexagonal prisms, shop problems.
2	Free hand isometric sketching of simple objects with dimensions. Free hand sketching plan and elevation of simple objects like hexagonal bar square bar, circular bar, tapered bar, hollow bar.	Heat and temperature their metric scale Fahrenheit and centigrade scales and their conversion. Name and use of temperature measuring instruments used in workshops.
3	Free hand sketching plan and elevation of simple objects like hexagonal bar square bar, circular bar, tapered bar, hollow bar. Views of simple solid and hollow bodies cut by section plane. Free hand isometric sketching of simple objects with dimensions.	Geometric properties of lines, angles, triangles and circles. Simple problems on lines, angles, triangles and circles.
4	Layout plan of a small village or town and mark the water line with valves of all types & the position of the reservoir.	Simple estimation or requirements of material for different jobs. Calculation of volume and weight of pipes of different dia and thickness Determination of pipe length.
5	Study of building plan & mark the position of the sanitary fittings, water supply line, drainage line connection to sewage line.	Electricity and its uses, electric current positive and negative terminals. Use of switches and fuses, conductor & insulators. Reading of simple graphs.
6	Longitudinal section of the house drain. Drainage arrangements of workshop of an institution.	Meaning of work and energy. Explanation of energy H.P. Shop problems. Reading of simple graphs.
7		Estimation on requirements of materials for pipe. Layout and installation.

Plumber

9.2 EMPLOYABILITY SKILLS

(DURATION: - 110 HRS.)

Block – I (Duration – 55 hrs.)	
1. English Literacy Duration : 20 Hrs. Marks : 09	
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)
Functional Grammar	Transformation of sentences, Voice change, Change of tense, Spellings.
Reading	Reading and understanding simple sentences about self, work and environment.
Writing	Construction of simple sentences Writing simple English
Speaking / Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.
2. I.T. Literacy Duration : 20 Hrs. Marks : 09	
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.
Computer Operating System	Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.
Word processing and Worksheet	Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets.
Computer Networking and Internet	Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web

Plumber

	<p>page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication.</p> <p>Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.</p>
<p>3. Communication Skills</p> <p>Duration : 15 Hrs. Marks : 07</p>	
Introduction to Communication Skills	<p>Communication and its importance</p> <p>Principles of Effective communication</p> <p>Types of communication - verbal, non verbal, written, email, talking on phone.</p> <p>Non verbal communication -characteristics, components-Para-language</p> <p>Body language</p> <p>Barriers to communication and dealing with barriers.</p> <p>Handling nervousness/ discomfort.</p>
Listening Skills	<p>Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening.</p> <p>Triple- A Listening - Attitude, Attention & Adjustment.</p> <p>Active Listening Skills.</p>
Motivational Training	<p>Characteristics Essential to Achieving Success.</p> <p>The Power of Positive Attitude.</p> <p>Self awareness</p> <p>Importance of Commitment</p> <p>Ethics and Values</p> <p>Ways to Motivate Oneself</p> <p>Personal Goal setting and Employability Planning.</p>
Facing Interviews	<p>Manners, Etiquettes, Dress code for an interview</p> <p>Do's & Don'ts for an interview.</p>
Behavioral Skills	<p>Problem Solving</p> <p>Confidence Building</p> <p>Attitude</p>
<p>Block – II</p> <p>Duration – 55 hrs.</p>	
<p>4. Entrepreneurship Skills</p> <p>Duration : 15 Hrs. Marks : 06</p>	
Concept of	<p>Entrepreneur - Entrepreneurship - Enterprises:-Conceptual issue</p>

Plumber

Entrepreneurship	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.
5. Productivity	
Duration : 10 Hrs. Marks : 05	
Benefits	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard.
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation - How improves or slows down.
Comparison with developed countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.
6. Occupational Safety, Health and Environment Education	
Duration : 15 Hrs. Marks : 06	
Safety & Health	Introduction to Occupational Safety and Health importance of safety and health at workplace.
Occupational Hazards	Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.
Accident & safety	Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.

Plumber

First Aid	Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person.
Basic Provisions	Idea of basic provision legislation of India. safety, health, welfare under legislative of India.
Ecosystem	Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of Energy, re-use and recycle.
Global warming	Global warming, climate change and Ozone layer depletion.
Ground Water	Hydrological cycle, ground and surface water, Conservation and Harvesting of water.
Environment	Right attitude towards environment, Maintenance of in -house environment.
7. Labour Welfare Legislation	
Duration : 05 Hrs. Marks : 03	
Welfare Acts	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.
8. Quality Tools	
Duration : 10 Hrs. Marks : 05	
Quality Consciousness	Meaning of quality, Quality characteristic.
Quality Circles	Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of House-keeping, Practice of good Housekeeping.
Quality Tools	Basic quality tools with a few examples.

10. DETAILS OF COMPETENCIES (ON-JOB TRAINING)

The **competencies/ specific outcomes** on completion of On-Job Training are detailed below: -

Practice and understand precautions to be followed while working in plumbing jobs. Prepare different types of documentation as per Commercial, industrial need by different methods of recording information:

Block – I

1. Understand and explain to perform out the different type of pipes for measure, mark, cut, file, drill, tap, thread ,fit, joint and allied operations with clear choice of procedures.
2. Understand and explain to perform out the different types of carpentry work allied operations with clear choice of procedures.
3. Understand and explain to perform out the different types of welding work allied operations with clear choice of procedures
4. Understand and explain to Perform out the different types of masonry work allied operations with clear choice of procedures
5. Understand and explain to plan, organize the work for different types of pipe cut, bend, lay, install, repair, and maintenance to check for to perform out the different allied operations with clear choice of procedures with result.

Block –II

6. Understand and explain the constructional features of water supply systems for lay, branch, install, test, repair and maintenance and set up different work and tool handle required to accomplish tasks on these work with required alignment and check for accuracy without any assistance.
7. Understand and explain the constructional features of Sanitary Systems and drainage systems for lay, branch, install, test, repair and maintenance and set up different work and tool handling required to accomplish tasks on these work with required alignment and check for accuracy without any assistance.

Plumber

8. Understand and explain the constructional features of home appliance for lay, install, test, repair and maintenance and set up different work and tool handling required to accomplish tasks on these work with required alignment and check for accuracy without any assistance.
9. Understand and practice of install and repair of different types of cocks, valves and pumps.
10. Understand and practice of lay rain water pipes & cutters, construction of rain water harvesting systems.
11. Demonstrate practical skills in water supply systems, sanitary systems drainage systems, home appliance, different types of cocks, valves, pumps, rain water pipes, cutters, and construction of rain water harvesting systems for prepare tools, materials & equipments, lay, install, test, repair and maintenance.

Note:

1. Industry must ensure that above mentioned competencies are achieved by the trainees during their on job training.
2. In addition to above competencies/ outcomes industry may impart additional training relevant to the specific industry.

Skill India
कौशल भारत - कुशल भारत

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

PLUMBER			
LIST OF TOOLS AND EQUIPMENT for Basic Training (For 20 Apprentices)			
A. TRAINEES TOOL KIT			
Sl. no.	Name of the Tool & Equipment	Specification	Quantity
1.	Rule Steel	300 mm Metric and British system	21 Nos.
2.	Rule Wooden	600 mm by Four fold	21 Nos.
3.	Hacksaw Frame	Adjustable Maximum blade length 300 mm	21 Nos.
4.	Scriber	200 mm length	21 Nos.
5.	Centre punch	100 mm length	21 Nos.
6.	Chisel Cold,	20 mm blade width Flat shape	21 Nos.
7.	Hammer	Ball peen 800 grms	21 Nos.
8.	Hammer	Ball peen 450 grms	21 Nos.
9.	File	Flat rough 300 mm	21 Nos.
10.	Level spirit	wooden 300 mm X , Y, Axis	21 Nos.
11.	Plumb bob	Metal 50 grams	21 Nos.
12.	Trowel C-125-I S: 6013	Steel Blade, Shape ,Size, wooden Handle	21 Nos.
13.	Stillson wrench	Jaw length 350 mm ,200 mm	21 Nos.
14.	Screw Driver	Blade length 250mmX 10mm width	21 Nos.
15.	Wooden Mallet small	250 gram weight (IS: 2022)	21 Nos.
16.	Cutting pliers I S : 3650	Pliers length 200 mm	21 Nos.
17.	Steel tape	Flexible winding type 5 met. Metric and British	21 Nos.
B : TOOLS INSTRUMENTS AND GENERAL SHOP OUTFITS			
18.	Marking Table	900X600X900mm high	1 no.
19.	'V' Blocks with-63A	IS: 2949 Clamps 80/7	1no.
20.	Combination set	200 mm	2 nos.
21.	Scribing Block, Universal,	300 mm	1 no.
22.	Hand Vice,	Jaw 50 mm	2 nos.
23.	File	Flat, Smooth 200 mm	2 nos.
24.	File	Half Round, Rough 300 mm	2 nos.

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25.	File	Square, rough 250 mm	2 nos.
26.	File	Square, Smooth 200 mm	2 nos.
27.	File	Triangular Rough 250 mm	2 nos.
28.	File	Flat Rasp 250 mm	2 nos.
29.	File	Triangular Smooth 200 mm	2 nos.
30.	Chisel	Cold Flat 20 mmX300mm	2 nos.
31.	Chisel	Cross Cut 6X150 mm I S-402	2 nos.
32.	Chisel	Round Nose 3X150 mm I S -402	2 nos.
33.	Chisel	I Diamond Point 6X150mm	2 nos.
34.	Die	set to cut B.S.F. ,B.S.W.	1 set each
35.	Tap and Wrench	metric threads of sizes M-6 to M-20	1 set each
36.	Screw Pitch gauge to cover above threads	metric threads of sizes M-6 to M-20	1 set
37.	Punch , Letter set	6mm	1 no.
38.	Punch , Number set	10 mm	1no.
39.	Wood Saw	Blade length 300 mm	2 nos.
40.	Spanner monkey	Metric thread open up to 50mm	2 nos.
41.	Stove melting solder	Industrial type Gas burner with Stove	1 no.
42.	Pipe Cutter wheel type	3 No's of Cutting wheel, 6mm to 25mm	1no.
43.	Oil stone	(carborundum) universal silicon carbide combination rough and fine 150X50X25mm	2 nos.
44.	Soldering Iron ,500 grms	Electric Soldering Iron 230 V 60 watts 230 V 25 watts	4 nos.
45.	Snip	Straight 250mm	2 nos.
46.	Snip	bend 250mm	2 nos.
47.	Try square	Blade stack 200mm	2 nos.
48.	Caliper	Inside 150mm	2 nos.
49.	Caliper outside 150mm	outside 150mm	2 nos.
50.	Odd leg caliper 200mm	Odd leg 200mm	2 nos.
51.	Ten on saw	Blade length , 300mm & 450 mm	2 nos.
52.	Hand Saw.	Blade length , 300mm & 450 mm	2 nos.
53.	Mortise Chisel	Blade edge width 06,10,15 mm	2 sets.
54.	Firmer Chisel	Bevel edge 6 mm. 10,15,20 and	2 sets.

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		25 mm. width (5 nos.)	
55.	Mallet Medium IS: 2922	Chisel, firmer (bevel) edge 6 mm. 10,15,20 and 25 mm. width (5 nos.)	2 nos.
56.	Jack plane	Jack metal 335 mm. X 50 mm cutter Plane smoothing, metal 200 mm. X 50 mm cutter	2 nos.
57.	Gas Welding set with oxygen acetylene cylinder	Gas Welding set with oxygen acetylene cylinder	1 no
58.	Goggles pair welder 100 mm	Clear class UV filter	2 pairs
59.	Brush Steel Wire 150X 50 mm	Steel wire brush 18 rows X 150 mm	1 no
60.	Table welding 1200X 750 mm with fire bricks top and stand	1200X 750 mm with fire bricks Top and stand	1 no.
61.	Pliers combination, 200 mm	Combination, 200 mm	2 nos.
62.	Blow lamp	2 Point Nozzle and 500 ml Kerosene cap	2 nos.
63.	Washer cutter	ID 6mm to 40mm	1 no.
64.	Mirror	100X150 mm	2 nos.
65.	Scribing gauge	150 mm x 3 mm (Engineer's)	1 no.
66.	Soil pot with brush		1 no.
67.	Pot- Hook		1no.
68.	D. E. Spanners	7X8, 10X11, 13X1. 7, 19X2.2, 24X27 IS:2028	2 sets.
69.	Branch Gimlets	For Excavation	2 nos.
70.	Bending Spring	Pipe bend up to 20mm	1 set.
71.	Plumbers Ladle	Cast iron ladle cap .10 kg.	2 nos.
72.	Tool caulking set of 5	Set of Caulking shaped Convex, Concave, Flat, shaped, length of 25-100 mm length of blade is tapper and regular	2 nos.
73.	Plumbers' metal melting pot 10 kg	Cast iron crucible No . 10 , 20,	1 no.
74.	Pipe stock and dies Taps and wrenches	Cutter ,with Complete stocks , Bush holder set with Pipes of bore dia 6,8,10,20,25,32,40 &50mm.	4 sets
75.	Pipe vice	Grip up to 77 mm is -2587 Heavy Duty	8 nos.

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76.	Stills on pattern pipe	IS -4003 450 mm to take pipe up to 52 mm dia	2 sets.
77.	Stills on pattern pipe	IS -4003 300 mm to take pipe 20 to 32 mm dia	2 sets.
78.	Chain : pipe wrench	IS : 4123 size: 90mm to 650mm	2 sets.
79.	Spanner Adjustable	IS- 6149, A-375, 15cm handle length, up to 50mm jaw open end	2 nos.
80.	Anvil	IS- 510 Face Stake Total weight of wrought Iron 50 or 63 kg	1 no.
81.	Pipe bender, manually operated	(Hydraulic Type) 12 mm to 30 mm	1 no.
82.	Leg vice, 75mm jaw on Stand IS - 2588	IS -2588 75mm jaw on Stand	1 no.
83.	Hand drill 6mm capacity with drill chuck (Electric)		1 no.
84.	Drill Twist (straight shank)	1.5 mm to 15 mm (various sizes) by 0.5 mm	1 set.
85.	Portable forge ,450mmwith hand blower	Hand blower with 0.5 HP power 100 mm out let , connect with Heating Chamber	1 no.
86.	Flat smithy tong	Tong Mouth 50mm length with Handle 300 mm and 450mm	2 nos.
87.	Working bench	2400x1200x750mm with 4 voice 125 mm jaws	2 nos.
88.	Bath tub small size		1 no.
89.	Wash Basin	(16"X14"X10")Equivalent	2 nos.
90.	Water Heater	10 liter	1 no.
91.	Water closet (European type p)	complete set of Closet and Low level cistern with sensor water flow arrangement and sensor water flow arrangement	1 set.
92.	Water closet (Indian type)	Complete set of closet and High level cistern with sensor water flow arrangement and without sensor water flow	1 set.

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		arrangement	
93.	Urinal wall type complete with automatic system	Wall mounted , separator, Bottle trap, cistern with sensor water flow arrangement and without sensor water flow arrangement	1 set.
94.	Water meter	Domestic Water flow detect meter 20mm outlet	2 nos.
95.	Fire extinguishers	Foam type and CO ₂ type with stuff Capacity	1 no.
96.	Fire Buckets with stand	Fire buckets with stand silica sand 2no. water 2 No. each 10 liter capacity	1 no.
97.	Sight rail and boning rod		1 no.
98.	Ratchet pipe die	15 mm to 32 mm	1 no.
99.	Double face hammers	250 grams with handle	2 nos.
100.	Dormat, Pickaxe, Spade, Girmale	Wooden handle with suitable for Excavation	1 each
101.	Solar water heater system		1 no.
102.	Ring gauge	15 mm,20mm,25mm,32mm	1 each
C : GENERAL MACHINERY INSTALLATIONS:-			
103.	Hammering drilling machine		1 no.
104.	Electric PPR pipe welding machine		1 no.
105.	Electric pump, 1 HP Centrifugal, Jet,		1 no. Each
106.	D.E. pedestal grinder	two wheels 175mm rough and smooth.	1 no.
107.	Hydraulic pressure machine for testing leakage in GI pipe fittings etc.		1 no.
108.	Bench drilling machine with chuck and key	Up to 15mm capacity	1 no.
109.	Pipe bender(Hydraulic type)		1 no.

Note: In case of basic training setup by the industry the tools, equipment and machinery available in the industry may also be used for imparting basic training.

PLUMBER

INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING DRAWING

TRADE: PLUMBER

LIST OF TOOLS& EQUIPMENTS FOR -20APPRENTICES

1) Space Norms : 45 Sq. m.(For Engineering Drawing)

2) Infrastructure:

A : TRAINEES TOOL KIT:-			
Sl. No.	Name of the items	Specification	Quantity
1.	Draughtsman drawing instrument box		20+1 set
2.	Set square celluloid	45° (250 X 1.5 mm)	20+1 set
3.	Set square celluloid	30°-60° (250 X 1.5 mm)	20+1 set
4.	Mini drafter		20+1 set
5.	Drawing board	(700mm x500 mm) IS: 1444	20+1 set
B : Furniture Required			
Sl. No.	Name of the items	Specification	Quantity
1	Drawing Board		20
2	Models : Solid & cut section		as required
3	Drawing Table for trainees		as required
4	Stool for trainees		as required
5	Cupboard	Big	01
6	White Board	Size: 8ft. x 4ft.	01
7	Trainer's Table		01
8	Trainer's Chair		01

PLUMBER

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.

Skill India
कौशल भारत - कुशल भारत

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 :			Semester:			Duration of the Trade/course:								
Learning Outcome:														
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														