**Syllabus for the trade**

**of**

# SANITARY HARDWARE FITTER

**(SEMESTER PATTERN)**

**under**

**CRAFTSMAN TRAINING SCHEME**

**Designed in: 2013**

**By**

**Government of India**
**Ministry of Labour & Employment**
**Directorate General of Employment & Training**
**CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE**
**Block - EN - 81 SECTOR – V, SALT LAKE CITY,**
**KOLKATA – 700 091**

List of members of Trade Committee meeting for the trade of **"Sanitary Hardware Fitter" Held on 18-10-2011 at Advanced Training Institute Kolkata.**

| Sl.No | Name & Designation S/Shri/Smt | Organisation | Remarks |
|---|---|---|---|
| 1. | N.K.Chatterjee,Director | A.T.I.Kolkata | Chairman |
| 2. | J.Ukil. Jt.Director | A.T.I.Kolkata | Member |
| 3. | S.P.Bhatterjee,DDT | A.T.I.Kolkata | Member |
| 4. | G.C.Saha,ADT | A.T.I.Kolkata | Member |
| 5. | Prasanta Kumar Paul, JE | CPWD,Kolkata | Member |
| 6. | A.K.Kolay,Asst.Engg. | CPWD,Kolkata | Member |
| 7. | Saikat Dutta | Project Manager, M/s Unit Construction Co.(P) Ltd. Kolkata | Member |
| 8. | A.K.Dutta,ADT | A.T.I.Kolkata | Member |
| 9. | A.K.Mondal,ADT | A.T.I.Kolkata | Member |
| 10. | Sk.A.Hossain,T.O | A.T.I.Kolkata | Member |
| 11. | Soma Das,V.I | RVTI,Kolkata | Member |
| 12. | Manika Banerjee,V.I | Don Bosco,SERI | Member |
| 13. | Subrata Saha | Representarive of Govt. of W.B | Member |
| 14. | Ajoy Kumar Hazra Choudhury | Representarive of Govt. of W.B | Member |
| 15. | Abhijit Kumar Porel | Representarive of Govt. of W.B | Member |
| 16. | Pradip Kumar Sarkar | Representarive of Govt. of W.B | Member |
| 17. | Somnath Adhikari | Consulting Engineer | Member |
| 18. | P.K.Madavi, | CTI,Chennai | Member |
| 19. | A.K.Neogy | CSTARI,Kolkata | Member |
| 20. | Dilip Ghosh, | ATI ,Kolkata | Member |
| 21. | T.K.Halder | ATI,Kolkata | Member |
| 22. | R.K.Saha | ATI ,Kolkata | Member |
| 23. | Prabhat Kumar Roy | Representarive of Govt. of W.B | Member |
| 24. | S.Rana,V.I | ATI,Kolkata | Member |

**List of members attended the Workshop to finalize the syllabi of existing CTS into Semester Pattern held from 6th to 10th May'2013 at CSTARI, Kolkata.**

| Sl. No. | Name & Designation | Organisation | Remarks |
|---|---|---|---|
| 1. | R.N. Bandyopadhyaya, Director | CSTARI, Kolkata-91 | Chairman |
| 2. | K. L. Kuli, Joint Director of Training | CSTARI, Kolkata-91 | Member |
| 3. | K. Srinivasa Rao,<br>Joint Director of Training | CSTARI, Kolkata-91 | Member |
| 4. | L.K. Muhkerjee,<br>Deputy Director of Training | CSTARI, Kolkata-91 | Member |
| 5. | Ashoke Rarhi,<br>Deputy Director of Training | ATI-EPI, Dehradun | Member |
| 6. | N. Nath,<br>Assistant Director of Training | CSTARI, Kolkata-91 | Member |
| 7. | S. Srinivasu,<br>Assistant Director of Training | ATI-EPI, Hyderabad-13 | Member |
| 8. | Sharanappa,<br>Assistant Director of Training | ATI-EPI, Hyderabad-13 | Member |
| 9. | Ramakrishne Gowda,<br>Assistant Director of Training | FTI, Bangalore | Member |
| 10. | Goutam Das Modak,<br>Assistant Director of Trg./Principal | RVTI, Kolkata-91 | Member |
| 11. | Venketesh. Ch. , Principal | Govt. ITI, Dollygunj, Andaman & Nicobar Island | Member |
| 12. | A.K. Ghate, Training Officer | ATI, Mumbai | Member |
| 13. | V.B. Zumbre, Training Officer | ATI, Mumbai | Member |
| 14. | P.M. Radhakrishna pillai,<br>Training Officer | CTI, Chennai-32 | Member |
| 15. | A.Jayaraman, Training officer | CTI Chennai-32, | Member |
| 16. | S. Bandyopadhyay, Training Officer | ATI, Kanpur | Member |
| 17. | Suriya Kumari .K , Training Officer | RVTI, Kolkata-91 | Member |
| 18. | R.K. Bhattacharyya, Training Officer | RVTI, Trivandrum | Member |
| 19. | Vijay Kumar, Training Officer | ATI, Ludhiana | Member |
| 20. | Anil Kumar, Training Officer | ATI, Ludhiana | Member |
| 21. | Sunil M.K. Training Officer | ATI, Kolkata | Member |
| 22. | Devender, Training Officer | ATI, Kolkata | Member |
| 23. | R. N. Manna, Training Officer | CSTARI, Kolkata-91 | Member |
| 24. | Mrs. S. Das, Training Officer | CSTARI, Kolkata-91 | Member |
| 25. | Jyoti Balwani, Training Officer | RVTI, Kolkata-91 | Member |
| 26. | Pragna H. Ravat, Training Officer | RVTI, Kolkata-91 | Member |
| 27. | Sarbojit Neogi, Vocational Instructor | RVTI, Kolkata-91 | Member |
| 28. | Nilotpal Saha, Vocational Instructor | I.T.I., Berhampore, Murshidabad, (W.B.) | Member |
| 29. | Vijay Kumar, Data Entry Operator | RVTI, Kolkata-91 | Member |

## GENERAL INFORMATION

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| 1. | Name of the Trade | : SANITARY HARDWARE FITTER |
| 2. | N. C. O. code No | : |
| 3. | Duration | : 6 Months (One semester having duration of six months) |
| 4. | Power Norms | : 4.3 Kw |
| 5. | Space Norms | : 56 Sq. Meter. |
| 6. | Entry Qualification | : Passed 8th Class Examination |
| 7. | Unit Size (No. of Student) | : 16 |
| 8a. | Instructor's/Trainer's Qualification | : Degree / Diploma in Civil / Architectural Engineering and one / Two years post qualification experience respectively.<br><br>OR<br><br>NTC passed in the related trade with 5 year post qualification experience.<br><br>OR<br><br>NAC passed in the related trade with 4 years post qualification experience. |
| 8b. | Desirable Qualification | : Preference will be given to a candidate with Craft Instructor Certificate. |

Note: At least one Instructor must have Degree/Diploma in Civil Engineering/Architectural Engineering.

Syllabus for the trade of "**SANITARY HARDWARE FITTER**"
under Craftsman Training Scheme (CTS)
**(Semester Code no. SHF - 01)**
**Duration : Six Month**

| WEEK NO | TRADE PRACTICAL | TRADE THEORY | ENGINEERING DRAWING | W/CALCULATION & SCIENCE |
|---|---|---|---|---|
| 1 | Importance of the trade in the development of industrial economy of the country. Importance of safety and general precautions to be observed in the institute and the section. Necessary guidance to be provided to the new corners to become familiar with the working of Industrial Training Institute. | Familiarisation with the institute. Importance of the trade training machineries. Types of work to be done by trainees in the institute. | Free hand sketching of straight lines, rectangles, Squares, circles, polygons etc. (IS: 696) | ---------- |
| 2 | **Fitter Hand Tools** : use of steel rule engineers 'square, scriber and dividers, hacksaw, centre punch, chisels, hammer, callipers, different files, bench vice and hand vice , taps , dies and holders. | Safety precautions and elementary First Aid, common hand tools of fitter trade their name, description and material used. | Free hand sketching with dimension to scale and proportionate sketching of hacksaw, centre punch, chisel, hammer, calipers, files, vices, taps and dies, holders, etc. | Applied workshop problems involving multiplication and division. Decimal addition, subtraction, multiplication and division. Conversion of decimal to common fraction and applied problems. |
| 3 | Use of hacksaw, centre, punch, filing to line drilling holes. Fitter a work – piece flat and square. Fastening devices –fixing of mating pairs, check nut, locking pins. Use of mason hand | Description of simple fitting operations, hacksawing, punching and filing. Types of files. Making instruments and their uses. Description of different types of locking and fastening devices. | - do - | Applied workshop problems involving common fraction addition, subtraction, multiplication and division. |

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| | tools : straight edge spirit level, plumb bob, square, etc. | Description and use of mason's hand tools. | | |
| 4 | Use of hammers, chipping, Grinding of chisels, cold chisel, round nose chisel. Drilling and taping, dieing, making internal and external threads. | Description of simple drilling machine. Method of using drills, taps and dies. | Sketching of views of simple bodies. | Proportions and uses of cast iron, wrought iron plain carbon steel, high speed steel & alloy steel. Applied workshop calculation problems. Properties & uses of copper, zinc, lead, tin, aluminium, bras, bronze, solder, bearing metals, timber, rubber, leather, asbestos, plastic materials ceramic asphalt etc. Reduction of common fraction to decimal fractions, shop problems. |
| 5 & 6 | Construction of an inspection chamber of any convenient size. Forming, benching and channelling and Plastering the walls. | Plain cement concrete, RCC and its proportion, grades of coarse aggregate and fine aggregate, Jhama-concrete with cement mortar and lime mortar. Knowledge of waterproofing compound, inspection chamber, septic tank. | Simple orthographic projection – First angle. | Metric system : weight & measurement units. |
| 7 | Threading pipe of various sizes. Fixing of different fittings. | Different kinds of joints in joining pipes (GI, CI, PVC/CPVC and HDPE etc.) | Simple orthographic projection – First angle. | Metric system : weight & measurement units. |
| 8 | Identification, demonstration, use and care of the plumber's hand tools and equipments and precaution to be observed. | Description and use of plumber's tools and equipments – ratchet brace, threading die, steelson wrench, sliding wrench, spanner set, plumber kit (tampin, bent pin, | Simple orthographic projection – First angle. | Square root of a whole number and a decimal. |

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| | | plumber's hammers dressers, mallets, wedges, draw knife and step turner), wrench etc. and their safety. | | |
| 9 | Cutting pipes of different metals of different dimensions. Fixing of rain water pipe, draining of rainwater and ground water. | Care and use of tools. Materials used in sanitary hardware work –brass, copper, zinc, lead tin, solder, gun metal, etc. White lead and red lead. | Simple orthographic projection third angle. | The weight of a body, unit of weight shop problems. Percentage and its application - shop problems. |
| 10 | Fixing of waste pipe of cast iron, PVC and asbestos cement with suitable bends and junction joining with lead and cement. | Description of soil and waste pipe. Description of rain water pipe. Single and double pipe system specially used in soil and waste pipe line work. | View of simple hollow and solid bodies with dimensions. Types of lines – symbol and use. | CGS, FPS and SI system of of units of length, weight and their conversion. |
| 11 | Fixing of vent pipe for soil and waste pipe, anti-siphonage pipes. | Description of vent pipe and its importance. Description of anti siphonage hardware items and fittings. Pipe and its importance. | Views from hollow and solid bodies with dimensions. Types of lines - symbol and use. | Ratio and proportion, applied problems. |
| 12 | Water distribution system. Fixing of floor traps in kitchen and bath. Threading of GI pipes, using pipe die of various sizes, steps of simple pipe connection. | Distribution system for OHR. Description of traps, valves. Types of traps, valves. Method of testing of soil and waste pipes. | Standard sizes of pipes, outside and inside diameter, thickness of different pipes. Symbols used in sanitary their units. | Work, power and energy, Applied problems on work, power and energy. as per IS specification. |
| 13 | Layout of water pipe connection to the sanitary fittings using different types of valves and fittings.Laying and joining of cast iron pipes | Storage tank, distribution of water, intermittent and constant water supply system, gravity system, pumping, storing and distribution of water. | Simple isometric drawings Reading of pipeline drawing and isometric drawing of pipeline distribution system. | Definition of friction related Work, power and energy. terms, types of friction, advantage and disadvantage of friction in practical field. |

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| | (lead pouring and lead caulking) | | | |
| 14 | Reconditioning of taps, valves, cistern and checking for correct functioning. | Causes of damage of taps, valves, water meter and tank, etc. Method of rectification and modification. Testing of water leakage (by hydraulic test and smoke test) | -- do -- | Friction on plain & inclined surfaces. Problems on friction. |
| 15 | Practicing on cutting and shaping PVC/HDPE pipes to sizes, use and fixing of PVC/HDPE fittings and joints, layout according to drawing. | Description, IS specification, properties and uses of PVC/HDPE pipe, methods of cutting and preparation of joints. Layout of PVC/HDPE pipes. Saddle connection for house service. | Simple isometric drawings. Isometric views of simple objects- squares, rectangles, cubes and blocks, etc. | Centre of Gravity – meaning and location. Mass, weight and Specific gravity. |
| 16 | Installation of Indian and western style water closet with flushing cistern, flush pipe connection, water connection etc. drainage outlet line, inspection chamber. | Description of Indian and western style WC. Standard sizes, types, precautions to be observed while installing. | Drawing of symbols – pipes, valves and fittings. | Menstruation: areas of rectangle, square, triangle, circle and regular polygon. |
| 17 | Installation of urinal basin with automatic flushing, cistern fixing lead waste or PVC waste and connected to the same to the inspection chamber. | Types of urinal basin, description of flushing devices, tipper automatic tank, syphonic ball, symphonic tank of high level and low level, working principle of flush valve and siphon ball valves, check valves. | Line diagrams of the water service line. | Shop problems on areas of rectangle, square, triangle, circle and regular polygon. |
| 18 | Installation of bath tub with hot and cold water connection with shower, overflow and waster connection, soap dish etc. | Description of bath tub and geyser - accessories required for installation. | Line diagrams of water service line with valves and fittings | Heat and temperature – their metric scale. Fahrenheit and centigrade scales and their conversion |

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| 19 | Installation of sink with draining board waste outlet and connection with all fittings, water service connection to the sink. | Description of sink, types and sizes of kitchen sink, pantry sink, bedpan sink, laundry sink, slop sink etc. waste outlet fittings of suitable sizes. | Reading of building plan and marking the position of sanitary fittings, water supply line, drainage line and connection to sewage line. | Shop problems on determination of volume and weight of solid bodies. |
| 20 & 21 | Installation of wash hand basin with lead waste or PVC waste pipe, connecting pillar tap to service line , fixing of mirror plate glass self, towel rail, soap dish, hot and cold taps with pop-up, waste connection to the gully trap or floor trap. Demonstrating the working principle of bidet washing through range, WC range, urinals flushing arrangement and method of arranging the waste the outlet. | Description of wash hand basin its standard sizes, types and accessories required for installation, mirror fitting glass self – fitting, towel rail fitting and precautions for their installation. Importance of introducing trap of the sanitary fitting. Deep seal traps and low seal traps, crown vent materials and sizes. | Reading of building plan and marking the position of sanitary fittings, water supply line, drainage line and connection to sewage line. | Simple estimation of required material for different work pieces. |
| 22 | Fixing of gully trap and connecting the same to the chamber. | Earthwork excavation, laying drain pipes, precautions to be observed, full shoring /partial shoring for the trench, width of the trench corresponding depth of the drain, refilling of trench, testing of drain pipes (pressure smoke, and light test) | Longitudinal section of house drain. Drainage arrangements of workshop of an institution. | Estimation on requirements of materials for pipe layout and installation. |
| 23 | Laying and joining of stoneware pipe with the help of | Conservancy system and water carriage system. Combined system of drain and | Drainage arrangements of workshop of an Institution. | Estimation on requirements of materials for pipe layout and |

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| | straight rail and boning rod, joining of stoneware pipes, according to soil conditions and water level. | separate system of drain, types of drain, method of setting straight rail and boning rod and gradients to be allowed to stoneware pipes according to the size. Self cleaning velocity sewage system. | | installation. |
| 24 | Providing layout connection to septic tank, soak pit, manhole, vent pipe, etc., and waste water disposal.<br><br>Cleaning of sanitary fittings, scrapping and painting of pipes, tracing out leakage and repairing valves, taps, pumps, air locks in pipe lines and removal. Use of epoxy resin. Renewal of joint. Renewal of packing from valves taps and pumps. Determining and locating the faults if any for the above. | Description of vent pipe and its necessity, traps used in drainage line, Greece trap gully trap, intercepting trap, types of manholes , cesspool, soak pit, septic tank. Size of septic tanks according to the users, dispersion trench.<br><br>**Corrosion** - causes, prevention and remedies. Corrosion due to electrolytic action.<br>Use and reason of packing. Important points to check the proper working of pipe lines. Recycling system of rainwater. Estimating materials requirement of sanitary hardware from a building layout. | Drainage arrangements of an administrative building.<br><br>Exercises on Engineering Drawing. | Revision |
| 25 | Revision | | | |
| 26 | Examination. | | | |

## LIST OF TOOLS AND EQUIPMENT FOR THE TRADE OF 'SANITARY HARDWARE FITTER'' UNDER CTS (FOR A BATCH OF 16 TRAINEES)

| SI. No. | Item | For Instructor | For Trainees |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| **A : TOOL KIT** | | | |
| 1. | Steel rule 300mm. Both in inch and mm. | 1no. | 16 nos. |
| 2. | Rule wooden 4 fold 600mm. | 1no. | 16 nos. |
| 3. | Hacksaw frame adjustable for 250to 300mm | 1no. | 16 nos. |
| 4. | Scriber 200mm. | 1no. | 16 nos. |
| 5. | Centre Punch 100mm. | 1no. | 16 nos. |
| 6. | Chisel, cold , flat 20x250mm | 1no. | 16 nos. |
| 7. | Hammer ball pein 800gms. | 1no. | 16 nos. |
| 8. | Hammer ball pein 300gms. | 1no. | 16 nos. |
| 9. | File flat rough 300mm. | 1no. | 16 nos. |
| 10. | Level sprit Wooden 300mm. | 1no. | 16 nos. |
| 11. | Plumb bob 50gms. | 1no. | 16 nos. |
| 12. | Trowel 125 | 1no. | 16 nos. |
| 13. | Stillson wrench200&300mm. | 1each | 16 nos. |
| 14. | Screw driver 250mm. | 1no. | 16 nos. |
| 15. | Wooden mallet small | 1no. | 16 nos. |
| 16. | Cutting Pliers 200mm | 1no. | 16 nos. |
| 17. | Steel tape 5m | 1no. | 16 nos. |

**B : TOOLS, MEASURING INSTRUMENTS, SHOP OUTFIT & GENERAL INSTALLATIONS**

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| 18. | Surface plate 400x400mm. Grade 1 | 1no. |
| 19. | Scribing Block universal 300mm. | 1no. |
| 20. | Hand vice jaw 50mm. | 2nos. |
| 21. | File flat smooth 200mm. | 2nos. |
| 22. | File half round rough 300mm. | 2nos. |
| 23. | File square s rough 250mm. | 2nos. |
| 24. | File square smooth 200mm. | 2nos. |
| 25. | File triangular rough 250mm. | 2nos. |
| 26. | File flat rasp 250mm. | 2nos. |
| 27. | File triangular smooth 200mm. | 2nos. |
| 28. | Chisel cold flat 20mm.x300mm. | 2nos. |
| 29. | File square rough 250mm. | 2nos. |
| 30. | Chisel cross cut 6x150mm IS:402 | 2 nos. |
| 31. | Chisel round nose 3x150mmIS: 402 | 2nos. |
| 32. | Chisel diamond point 6x150mm | 2nos. |
| 33. | Tap and die set to cut BSP Thread | 1 set |
| 34. | Punch letter set | 1set |
| 35. | Punch number set | 1set |
| 36. | Chase wedge 50mm | 3nos. |
| 37. | Dress lead 350x50mm | 4nos. |
| 38. | Stick setting in 350x50mm | 4nos. |

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| 39. | Saw plumber 300mm | 4 nos. |
| 40. | Spanner monkry up to 50mm | 2nos. |
| 41. | Cutter pipe wheel type 6mm to 25 mm | 1no. |
| 42. | Pipe jointer, lead, universal | 1no. |
| 43. | Oil stone 150mmx 50mmx 25mm | 3 nos. |
| 44. | Soldering iron , copper fit, fire heated | 4nos. |
| 45. | Snip straight 250mm. | 4nos. |
| 46. | Try square 200mm | 4nos. |
| 47. | Inside calliper 150mm | 4nos. |
| 48. | Caliper outside 150mm | 4nos. |
| 49. | Odd leg calliper 200mm | 4nos. |
| 50. | Tenon saw | 2nos. |
| 51. | Handsaw | 2nos. |
| 52. | Mortice chisel | 2 sets. |
| 53. | Firmer chisel | 2sets. |
| 54. | Mallet medium IS:2922 | 2sets |
| 55. | Jack plane | 2sets |
| 56. | Pliers combination 200mm | 2nos. |
| 57. | Blow lamp 500 millilitre | 4nos. |
| 58. | Pipe opener | 1nos. |
| 59. | Washer cutter | 1no. |
| 60. | Pressing stick | 1no. |
| 61. | Mandrel | 2 nos. |
| 62. | Plumber kit containing tampin, bent pin , plumbers hammers dressers, mallets, chase wedges, draw knife and step turner | 2sets |
| 63. | Bobbin and follower | 2each |
| 64. | Bend bolt | 2nos. |
| 65. | Sheet lead knife | 2nos. |
| 66. | Chipping knife | 2nos. |
| 67. | Mirror 100x150mm | 2nos. |
| 68. | Splash stick | 1no. |
| 69. | Soil pot with brush | 1nos. |
| 70. | Pot hook | 1no. |
| 71. | Turn pin | 1 no |
| 72 | D.E. Spanners 7x8, 10x11, 13x17,19x22, 24x27,IS:2028 | 2os. |
| 73 | Branch gimlets | 2 nos. |
| 74. | Bending spring | 1 sets. |
| 75. | Long dumy | 2 nos. |
| 76. | Short dumy | 2 nos. |
| 77. | Plumbers ladle | 2nos. |
| 78. | Joining cramp | 2 nos. |
| 79. | Plumbers metal melting pot 10 kg. | 1 nos. |
| 80. | Pipe stocks and dies complete with stocks brushing bushing holders taps and tap wrenches sizes covered to suit pipes of bore dia 6,8, 10, 20, 235, 32,40and 50 mm. | 6sets |
| 81. | Pipe vice to grip pipes up to 77mm, IS:2587 | 8 nos. |
| 82. | Tool caulking set of 2 | 2 sets |
| 83. | Stillson pattern pipe wrenches 450mm to take pipe upto 52mm dia IS:4003 | 2 sets |
| 84. | Stillson pattern pipe wrenches 450 mm to take pipe upto 52 mm dia IS:4003. | 2sets. |

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| 85. | Chain pipe wrench 90mm-650mm IS:4223 | 1no. |
| 86. | Adjustable spanner A 375 IS :510 | 2 nos. |
| 87. | Anvil 50 or 63 kg. IS :2049 | 1 no. |
| 88. | Pipe bender manually operated | 1 no |
| 89. | Vice leg 75 mm jaw on stand IS 2588 | 1no |
| 90. | Hand drill 6mm capacity with drill chuck | 1 no |
| 91. | Drill twist ( straight shank ) 3mm to 6mm | 1no. |
| 92. | Portable forge 450 mm with hand blower | 1 no. |
| 93. | Flat smithy tong | 2 nos. |
| 94. | Working bench 2400*1200*750mm with 4 vice 125 mm jaws. | 2 nos |
| 95. | Bath tub small size | 1 no |
| 96. | Stop tap water 20 mm IS : 781 | 4 nos. |
| 97. | Wash basin ( 20"*14"*10") equivalent metric | 2 nos |
| 98. | Water heater 22 litres | 1 no |
| 99. | Water closer (European type with down type cistern ) | 1 set |
| 100. | Water closer Indian type complete with over head cistern | 1set |
| 101. | Urinal wall type complete with automatic system | 1set |
| 102. | Water meter | 2nos. |
| 103. | Steel lockers with 8 drawers | 2nos. |
| 104. | Metal rack 1800* 1500* 450mm | 1no. |
| 105. | Desk | 1no. |
| 106. | Stool | 1no. |
| 107. | Black board with easel | 1no. |
| 108. | Fire extinguisher | 1no. |
| 109. | Fire buckets with stub | 1no. |
| 110. | Steel almirah | 1no. |
| 111. | Ratchet brack with post and clamp flat drill 6 to 35 mm by 0.2 mm | 1 set |
| 112. | PVC welding plant | 1no. |
| 113. | Electric pump 1 HP | 1no. |
| 114. | D.E. pedestal grinder with two wheels 175 rough | 1no. |
| 115. | Hydraulic pressure machines for testing leakage in GI pipe fitting etc. | 1 no. |
| 116. | Sight rail and banning rod. | 1each |
| 117. | Bench drilling machine with chuck and key up to 15 mm | 1no. |
| 118. | Double face hammers | 1set |
| 119. | Dormat, pickle, spade, Girmale. | 4 nos. |
| 120. | Pipe bender (Hydraulic type ) | 1each |
| 121. | Monkey plier (Gas pliers) | 1 no. |