Syllabus for The Trade

of

FIRE TECHNOLOGY AND INDUSTRIAL SAFETY MANAGEMENT

(SEMESTER PATTERN)

Under

Craftsmen Training Scheme

Designed in : 2013

By

Goverenment of India
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
Directorate General of Employment & Training
Ministry of Labour & Employment
EN 81, SECTOR – V, SALT LAKE CITY,
Kolkata – 700 091.

List of members of Trade Committee meeting for the trade of "Fire Technology and Industrial Safety Management"

Sl. No.	Name & Designation	Organisation	Remarks
1.	Mr. V.K.Garg, Chairman	DIFE, New Delhi	Chairman
2.	Capt. Krishan Kumar, Vice Chairman	DIFE, New Delhi	Member
3.	Mr. L.K.Mukherjee, Deputy Director	CSTARI, Kolkata	Member
4.	Mr. M.C.Sharma, Joint Director	CSTARI	Member
5.	Mr. N. Nath, Asstt. Director	CSTARI	Member
6.	Mr. V.P.Jayarajan, Principal	DIFE, New Delhi	Member
7.	Co. J.N.Pandey, Director Training	DIFE, New Delhi	Member
8.	Mrs. Puspa Jindal, Principal	Govt. Sr. Sec. School, New Delhi	Member
9.	Mr. Narender Krahana, Sr. Instructor	DIFE, New Delhi	Member
10.	Mr. M.N.Sharma, Principal	ITI, PUSA, New Delhi	Member
11.	Mr. B.P.Minocha, Engineer	ITI, PUSA, New Delhi	Member
12.	Mr. Praveen Chaudhary, HOD (Fire & Industrial Safety)	DIFE, New Delhi	Member
13.	Mr. Manish Kumar, HOD (Admn.)	DIFE, New Delhi	Member
14.	Mr. J.S.Beniwal, Office Superintendent	DIFE, New Delhi	Member
15.	Lt. P.S.Bhadana, Deputy Director of Training	DIFE, New Delhi	Member
16.	Mr. B.L.Chauhan, Asstt. Director of Training	DIFE, New Delhi	Member
17.	Mr. Ashok Kumar Tiwari, Sr. Instructor	DIFE, New Delhi	Member
18.	Sub. Vijay Singh, Sr. Instructor	DIFE, New Delhi	Member
19.	Mr. Ram Ji Singh, AGM	GMR, IGI Airport	Member
20.	Mr. Sudesh Kumar Sharma,	DIFE, New Delhi	Member
21.	Mr. Nepal Singh, Sr. Instructor	DIFE, New Delhi	Member
22.	Mr. Jagdish Chander, Instructor	DIFE, New Delhi	Member
23.	Mr. Monu Singh, Jr. Instructor	DIFE, New Delhi	Member
24.	Mr. Ranjan Prasad, Sr. Instructor	DIFE, New Delhi	Member
25.	Mr. Anil Kumar, Jr. Instructor	DIFE, New Delhi	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, Joint Director of Training	CSTARI, Kolkata-91	Member
4.	L.K. Muhkerjee, Deputy Director of Training	CSTARI, Kolkata-91	Member
5.	Ashoke Rarhi, Deputy Director of Training	ATI-EPI, Dehradun	Member
6.	N. Nath, Assistant Director of Training	CSTARI, Kolkata-91	Member
7.	S. Srinivasu, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
8.	Sharanappa, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
9.	Ramakrishne Gowda, Assistant Director of Training	FTI, Bangalore	Member
10.	Goutam Das Modak, 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, 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

1. Name of the Trade : Fire Technology and Industrial Safety Management
2. N. C. O. code No :
3. Duration : One Year (Two semesters)
4. Power Norms : 2 KW
5. Space Norm : 10000 Sq Yard. for practical Training area
6. Entry Qualification
    a. Passed class 12th Exam. Under 10+2 system of education or its equivalent.
    b. **The minimum physical requirements are**
        i. Height - 165 cm
        ii. Weight - 52 kg
        iii. Chest - Normal 81 cm - Expanded 85 cm
        iv. A registered MBBS doctor must certify that the candidate is medically fit to undertake the course
7. Unit strength : 20 (No. of Trainees)
8. Instructors' /Trainers Qualification : Degree in Fire & Safety Engineering/Degree in Fire Science with one year experience in the relevant field.

    OR

    Post Graduate Diploma in Industrial Safety Engineering/ Fire and Industrial Safety Engineering /Post Graduate Diploma in Health, Safety & Environment with two year experience in the relevant filed.

    OR

    Defence Officer JCOs/NCOs with 10 years of experience in the relevant field.

    OR

    National Examination Board Occupational Safety and Health (NEBOSH)/Occupational Safety and Health Administrator (OSHA) Certification-1 Yr Experience

    OR

    NTC/NAC in the trade of Fire Technology and Industrial Safety Management with 3 years experience in the relevant field.

9. Desirable Qualification : Preference will be given to a candidate with Craft Instructor Certificate (CIC)

At least one Instructor must have Degree/Diploma in relevant Trade.

Note: 1. Training area measuring 10000 Sq Yards for Practical Training , common to all courses is required/ used for all the three courses Viz Health Safety and Environment, Firemen, Fire Technology and Industrial Safety Management, if an institute is running all the above mentioned trade courses.
2. The stores marked with star are common and will be used for all the three courses.

Syllabus for the trade of "Fire Technology and Industrial Safety Management" under C.T.S

Duration : Six Months

First Semester

Semester Code :FTM:SEM:I

THEORY

1. **Basic Physics and Chemistry related to Fire :** Definition of Matter and energy, Physical properties of matter like Density, specific gravity, Relative density, Vapour density, Melting & Boiling point, flammable limits, latent heat, Effects of density on behaviour of gases, , Basics of oxidizing and reducing agents, Acids. Flammable liquids- classification and types of tanks, Dust and Explosion, Liquid and Gas Fires, LPG.
2. **Anatomy of Fire:** Definition of Combustion, Elements of Combustion, Products of Combustion, Heat of reaction and calorific value, Flash point, Fire point, Ignition temperature and spontaneous combustion.
3. **Classification of Fire & Extinguishers -** Classification of Fire and types of extinguishers, maintenance, method of operation. Techniques of fire extinction-Smothering cooling and starvation. Halon and its detrimental effect on environment. Alternatives of Halon.
4. **Hose and Hose Fittings:** Types of Suction and Delivery Hoses, Hose-reel, causes of decay, Care and Maintenance, Marking of Hose, Repair of hose, Standard tests of Delivery Hoses, Definition and different groups of Hose Fittings. Types and Construction of Suction; Monitors, Water-cum-foam Monitor, Nozzles & branch holders, collecting head and suction hose, Fittings; frost valve, Deep lift suction fittings, Breechings, Adaptors and Blank cap suction reduction piece, Hose Ramps, Care & Maintenance of Hose Fittings.
5. **Hydrant & Fittings:** Introduction of Hydrant and Water supplies, Hydrant Gears and Equipment, Marking, Testing, cares maintenance Operation.
6. **Foam & Foam Making Equipment:** Water as an extinguishant- its merits, demerits and modification. Introduction to all types of foam concentrate, properties of foams and techniques of extinguishment by foam, types of foams, Characteristics of good foam, foam making Equipment- Mechanical. High Expansion and Low Expansion Foam. Storage of foam Compound. Dry Chemical Powder- Types and application. Carbon dioxide as extinguishant.
7. **Pump & Pump Operation :** Classification of common types in use, Methods of Priming, Testing and Fault-finding, care and Maintenance and standard Test, Introduction of centrifugal pump, care and maintenance.
8. **Hydraulics:** Pressure and Head, pressure and Flow, mensuration, Nozzle's discharge, calculation of water capacity of tank, requirement for specific fire size.
9. **Electricity :** Fundamentals of electricity, Generation and Distribution, Common causes of electrical fire and its remedial measures, electrical hazards including static electricity and protective measures and fire-fighting procedure, Elementary knowledge of Fire Protection and fire-fighting in different premises, electrocution.
10. **Ladders:** Introduction, Types of Ladders, Construction features of conventional Ladders, Operational use, Elementary Knowledge of T.T.L. & Snorkel (As per Bureau of I.S.).
11. **Breathing Apparatus:** Introduction of Types of B.A. Sets in use, Working principles and Care and maintenance.
12. **Water Tender and Special Appliance :** Introduction to Rescue/ Emergency Tender, CO2 tender, DCP Tender, Hose laying lorry, Water Bouser and High pressure pumps, special appliances.

13. **Small & Special gears :** Function & Construction-G.R. Tools; Function & Construction-Breaking in and Cutting tools, Pulley blocks; Function & Construction-Lighting Function & Construction-Lifting & Rescue tools; Operation of hydraulically operated, diesel operated and electrically operated tools, . Care & maintenance of equipment.
14. **First Aid, Resuscitation:** Definition of First-Aid, Qualities of first aider, Shock-Signs and Symptoms, Asphyxia-Signs and Symptoms, Wounds and Hemorrhage -Classification of injuries, Signs, Symptoms and management, Burns, Scalds and frost Bits signs and symptoms and management. Causes and types of fractures Sprain & Dislocation-Signs and symptoms, Snake Bite-Treatment.
15. **Automatic Fire Detection cum Alarm System:** Introduction of Types of Detectors- Smoke, Heat, Flame/Gas Detectors, Operating principles, Control Panel.
16. **Discipline:** Introduction, Importance of Discipline, General Principles of discipline, essentials for discipline and outward Signs.
17. **Hazard and Risk:** Causes, Identification, Evaluation & Control. HAZOP, Sources for Information on Hazard Evaluation. Risk and Risk Analysis.
18. **Accident :** Industrial Accidents, Classification of Accidents, Need for the Analysis of Accidents, Accidents Reports, Methods Adopted for Reducing Accidents, Investigation of Accidents, Safety Slogans, Safety Precautions adopted in the Plant.
19. **Safety Concept** : Introduction to Safety Management, Safety Policy, Safety Committee, , Responsibility of Management, Safety Officers Duties & Responsibilities, Safety Targets, Objectives, Standards, Practices and Performances.
20. **FACTORIES ACT 1948 (Amended) :-**
21. **Health –** Cleanness, Disposal of Waste , Ventilation and Temperatures, Dust & Fumes, Drinking Water, Lighting, Latrines & urinals.
22. **Safety -** Fencing of machineries, Work on or near machinery in motion, Hoists and lifts, Pressure plants, Floors, Stairs and means of escape, Protection against fumes & gases, Safety offers.
23. **Welfare -** Washing facilities in Dry clothing, Storing, Sitting, First Aid Appliances, Canteen, Shelters for rest & lunch, Crèches, Welfare officers, Right & Obligation of workers.
24. **Lighting, Ventilation & Work related stress:** Introduction to Lighting, Ventilation, Heat Stress, Cold Stress, Noise.
25. **Construction Industry:** General Safety Provisions related to construction industry, Safety in the use of Construction Machinery, Safe Access / Egress Importance of Good House Keeping.

PRACTICAL

Familiarization with the Institute, Documentation of Student, Issuance of Dress, Books, Hostel Accommodation (If required) and Store. Importance of trade training, Equipments used in the trade, types of work done by the trainees in the trade. Introduction to safety equipments and their uses. Introduction of first aid, Road safety, operation of Electrical mains. **Knowledge of General Safety, Occupational health and hygiene.**

Demonstration of:-

- Various acids.
- Alkalis & Gases
- Organic flammable liquids and commonly used industrial chemical-

Fire-fighting technique.

- Drill I : Water CO2 Extinguisher Drill 9L

- Drill II :Chemical Foam Extinguishing 9 L
- Drill III : Mechanical Foam Extinguisher 9L
- Drill IV :Stored Pressure Water Extinguisher 9 L
- Drill V : Dry Chemical Powder 5 Kg
- Drill VI : Dry Chemical Powder 10 Kg
- Drill VII : ABC Extinguisher 5 Kg/ 10 Kg
- Drill VIII : CO_2 Extinguisher 4.5 Kg

Fire fighting Technique

Familiarization and demonstration of Hose and Hose fittings

- Drill – I : Hose pick up Drill
- Drill – II : Hose Running Drill with one hose
- Drill – III : Hose Running with two hose
- Drill – IV : Hose Running with Three hose

Familiarization and demonstration of Hydrant and its associated equipments.

- Hydrant Drill I : Opening of single line of three hoses.
- Hydrant Drill II : Change of burst hose
- Hydrant Drill III : Increase one length hose
- Hydrant Drill IV : Decrease one length hose
- Hydrant Drill V : Use of Collecting, breaching
- Hydrant Drill VI : Disconnect collecting breaching
- Hydrant Drill VII : Use of Dividing Breaching
- Hydrant Drill VIII : Disconnect of Dividing Breaching

Techniques to Handle various branches.

Familiarize with various type of electrical devices used for safety,

Demonstration recognition of electrical hazards

Control measures adopted.

Familiarization of foam making branch

- Use of FB2X, FB5X and FB10X,
- Care and maintenance of foam equipments,

Demonstration of effect of pressure on pump discharge rate and on ground use of pressure pumps.

Calculation of discharge capacity of pump,

Demonstration and familiarization of Extension Ladder

- Introduction of parts of extension ladder
- Rescue Operation from buildings.
- Drill I : Pitching of ladder
- Drill II : Climbing the ladder
- Drill III : Use leg Lock
- Drill IV : Ladder Drill with Fireman Lift
- Drill V : L2 Drill

Familiarization and Demonstration of Parts of BA Set.

Drill I : Donning, running and Rescue of casualty through tunnel.

- Familiarization and study First Aid Box
- Stretcher Drill
- Fireman Lift Drill
- Use Bandage
- Standard drills on Ambulance

Techniques of CPR

- One Sitter
- Two Sitter
- Three Sitter
- Four Sitter
- Fireman lift
- CPR drill
- Choking
- Shaffer's Method
- Rescue drill
- Sylvester's Method
- Holgar Nielsen Method
- Eve Rocking Stretcher Method
- Emerson Method
- Mouth to Mouth Respiration.

Familiarization with various types of Fire Fighting Small and Special rescue gear at Fire Service Station.

- Practical Use of equipments like cutting tools
- Lifting tools

Maintenance of tools.

25th Week : Project work / Industrial visit (optional)

26th Week: Examination

Syllabus for the trade of "Fire Technology and Industrial Safety" under C.T.S
Duration : Six Months

Second Semester
Semester Code :FTM:SEM:II

THEORY

1. **Fixed Fire Fighting Installations :** Introduction of Sprinkler System and their care and maintenance and operational Procedure, Elementary requirements of Drenchers, Rising Mains, Hose Reels And Down-comer, Automatic Fire Alarms system.
2. **Ropes and Lines :** Construction & Fibers sued for rope, types and uses of lines, causes of Deterioration Inspection and tests, methods of testing, care and maintenance, standard knots and their uses.
3. **Fire Service Administration :** Fire Service Organization, Executive duties of Officer-in-Charge of a Fire Station, Administrative duties of Officer-in-Charge of a station (a) Writing of a report (b) Occurrence Book, (c) Hose Card/Register, (d) Fire reports, (e) Workshop Orders, (f) Log books (g) Stock Registers (h) Orderly Room Registers, (i) Defaulter Register, (j) Leave Register, Station Discipline.
4. **Watch Room Procedure & Mobilizing :** Identification of communication requirement of Fire Service, Watch Room, Control Room, Equipment Station Ground, Turn-out area, Area of Topography , and Telephone Call area, Mobilizing boards and maps. The log & occurrence book, introduction to Various lines, communication Equipment in Fire Service, Introduction to Radio Communication and Use of VHF Sets.
5. **Practical Fireman ship:** Qualities of Fireman and his important duties at a Fire Station and Fire ground.
6. **Rural Fire :** Fire Hazards in rural areas and cause of fire, Hay stacks, Special appliance & equipment, Method of Fire-fighting in rural areas.
7. **Water Relay:** Types of relay-systems, water distribution System. Advantages and disadvantages-Calculation of hose.
8. **Salvage -** Introduction, Equipment for Salvage and working at Fires.
9. **Disaster Management:** Natural and Man-made Disaster, Preparedness for disaster, use of various agencies, first responders, control of situation, Incident Command System (ICS).
10. **Personal Protective Equipment :** Need for Personal Protection Equipment, Selection, Use, Care & Maintenance Respiratory and Non-respiratory Personal Protective Equipment, Head Protection, Ear Protection, Face and Eye Protection, Hand Protection, Foot Protection, Body Protection.
11. **Various Rescue techniques:** Rescue technique from lift, Sewer, Collapsed building, motor vehicle accident, Well & river, Special equipment and training requirements for rescue operations.
12. **Means of Escape:** Classification of escape routes with reference to N.B.C.
13. **Aircraft Fire and Rescue :** Some common terminology including 'Ejection Seats' etc, Preliminary about fire hazards in Air-Craft and action required for Rescue and fire-fighting, Resource of Fighting Fire in Air Ports
14. **Ship Fires:** Elementary knowledge of ship fire protection.
15. **Building Construction :** Introduction, highlighting importance of the subject, Classification of building in the country, Building materials and their behavior under fire conditions, signs of collapse of building, various types of occupancies and fire fighting techniques, Importance's of fire escapes with respect to there positioning, Reference to NBC part II fire construction and provisioning of fire fighting measures.
16. **Occupational Hazards & Dangerous Chemicals.** Introduction to Occupational Health Hazards & Dangerous Properties of Chemicals, Dust, Gases, Fumes, Mist, Vapours, Smoke and Aerosols, Concepts of Threshold Limit Values, Classification of Hazards.

17. **Working at Height, Confined Space:** Safety precautions related to Scaffolds, Ladders, Work at height including Roof Work**,** fall arrestors, Confined Space, Work Permit System, Excavation.
18. **Material Handling:** Safety related to Mechanical and Manual Material Handling, Lifting Appliances, Transport / Earthmoving & Material Handling Equipments – Cranes, Forklift Truck, Hoists, Conveyors.
19. **House Keeping and Waste Disposal:** Introduction of Good House Keeping & Maintenance, Introduction of Disposal of Waste Material.
20. **Hazardous Chemicals:** Dangerous Chemicals and substances, Introduction to Transportation and handling of dangerous chemicals and explosives, Storage of hazardous chemicals, Fire Safety and fire fighting.
21. **Safety in Engineering Industries:** Machine Operations & Guarding, Safety in the use of Machines, Safety precaution while using Hand Tools & Power Tools, Need for selection & Care of tools.

PRACTICAL

Familiarization and demonstration of Centrifugal pump.

- Drill I : Pen water pump drill (Dry Drill)
- Drill II : Lose water pump drill with hard/soft suction.

Familiarization and demonstration of Water tender

Water tender drill with close water.

- Drill I : L-2 Drill with ladder and water tender
- Drill II : Foam Drill with FBI0X single delivery
- Drill III : Foam Drill with FB5X single delivery
- Drill IV : Wet Drill with double delivery
- Drill V :Dry Drill with double delivery

- **Industrial/ Fire Service Station Visit**

Demonstration of Switch Board.

Familiarization and demonstration of equipments involved in salvage Operation

- Drill – I : Hose pick up Drill
- Drill – II : Hose Running Drill with one hose
- Drill – III : Hose Running with two hose
- Drill – IV : Hose Running with Three hose

Visit to Fire Service Station.

Familiarization to Fire Station Writing practices of

- Occurrence Book
- Duty Card/ Register
- Log Book
- Hose Book
- Stock Register

On ground demonstration and practice of ICS,

Simulated Practices to control life and properties damages from natural disaster.

Squad Drills in training ground.

Methods of entry into building, Searching for higher location of a trapped causality.

Methods of rescue.

Precautions to be observed when working in smoke laden buildings.

Construction Site Visit

Familiarization at construction site.

Introduction and identification of building material.

Planning of escape routine.

Familiarization and demonstration of fixed installation at visit to high rise building.

Practical training about Care and maintenance of sprinklers.

Use of Automatic fire alarm system.

Industrial Visit

Visit to Construction Site for familiarization about escape routes as

Ladder

Stair case etc.

- Drill I : Thumb Knots
- Drill II : Figure of 8 knots
- Drill III : Reef Knot
- Drill IV : Chair Knot
- Drill V : Half Hitch
    - Clove Hitch
    - Rolling Hitch
    - Tender Hitch

Drill VI : Bowline

Familiarization and demonstration of various equipments used in rescue of a causality.

- Ladder Drill with Fireman Lift
- Sewer Rescue drill,
- Stretcher drill

Visit to Air Port

Familiarize with various parts of aircraft
CFT
Ejection Seat
Fire fighting equipments used in case of accident.

- Drill I : Fighting Hay Stack fire
- Fire Extinguisher Drills
- Drill I : Water CO_2 Extinguisher Drill 9L
- Drill II : Chemical Foam Extinguishing 9 L
- Drill III : Mechanical Foam Extinguisher 9L
- Drill IV : Stored Pressure Water Extinguisher 9 L
- Drill V : Dry Chemical Powder 5 Kg
- Drill VI : Dry Chemical Powder 10 Kg
- Drill VII : ABC Extinguisher 5 Kg/ 10 Kg
- Drill VIII : CO_2 Extinguisher 4.5 Kg

Hazard Evaluation and Risk Analysis exercise.

Practical usages of Safety belt, helmets, gloves, and googles.
Visit to industrial unit and adoption of safety Practice.
Visit to industrial unit to observe prevailing welfare measures and their condition.

- Measurement of Heat & Noise

Construction Site Visit

- Practices of good House Keeping
- Study of egress and safe access.
- Hands on experience with Hand and power tools.

Construction Site Visit and identifying of causes of accident during material handling
Demonstration with fall arrestor, Sewer Rescue, Excavation Site Visit.
Demonstration and use of

- Helmet
- Face Shield
- BA Set
- Body Harness
- Gloves
- Safety Goggles
- Ear Protective Equipment (Ear muffs, Ear Plug
- Safety Shoes

BA set, donning, running.
Analysis of MSDS and Identification of Chemicals.
Practical hand in Laboratory about fumes and vapors.
Preparation of symbols for hazardous chemicals and Physical carriage of chemicals, methods of storage.
Revision & Test

TRADE: Fire Technology and Industrial Safety

LIST OF TOOLS & EQUIPMENT

A. TRAINEES TOOL KIT FOR 20 TRAINEES +one

Sl.No	NAME OF THE TOOLS & EQUIPMENTS	QUANTITY
1	Water CO2 Type Fire Extinguisher (9 Ltrs)	06 Nos
2	Stored pressure Type Fire Extinguisher (9 Ltrs)	06 Nos
3	Chemical Foam type Fire Extinguisher (9Ltrs)	06 Nos
4	Mechanical Foam type Fire Extinguisher 9Ltrs	06 Nos
5	CO2 Type Fire Extinguisher (4.5 Kg)	06 Nos
6	BC Type Fire Extinguisher 5/10 Kg	04 Nos
7	ABC Type Fire Extinguisher 5/10 Kg	04 Nos
8	Extension Ladder (Size)45/35 ft *	02 Nos
9	All types of Branches or Nozzles *	04 Nos
10	Fire Hose *	
	a) 15m	10 Nos
	b) 30m	04 Nos
11	First Aid Box *	02 Nos
12	All Types of small gears *	1 Set
13	BA Set (Negative & Positive Pressure) *	02 Nos
	a) Gas Cylinders	02 Nos
	b) Steel Back Plates	02 Nos
	c) Face Masks	02 Nos
14	Portable Fire Pump / TFP *	02 Nos
15	All types of couplings *	1 Set
16	Hydrant-Stand Pipe Type *	02 Nos
17	Fire Trays *	02 Nos
18	Manual call point *	01 No
19	Entry Suit/ Proximity Suit *	02 Nos
20	Hose reel system *	01 No
21	Nitrogen Cylinder *	01 No
22	Hose Box *	01 No
23	Fire Fighting Point complete Set *	01 No
24	Section Hose 10 ft *	02 Nos
25	Section Wrench *	02 Nos
26	Metal Strainer *	02 Nos
27	Basket Strainer *	01 No
28	Sprinkler *	02 Nos
29	Ropes 100 ft Long *	01 No
30	Lines 100 ft Long *	01 No
31	Control Panel – Model *	01 No
32	Personal Protective Equipment	
	a) Helmet (Type A,B,C)	20 Nos
	b) Laser Welding Safety Goggles	10 Nos

	c) Face Shield	10 Nos
	d) Welding Shield	10 Nos
	e) Ear Muff	10 Nos
	f) Ear Plug	10 Nos
	g) Canal Caps	10 Nos
	h) Safety Shoes	20 Nos
	i) Asbestos Gloves	10 Nos
	j) Electrical Hand Gloves	10 Nos
	k) Hand Gloves (Rubber)	10 Nos
	l) Dust Mask	10 Nos
33	Personal Protective Clothing for men	
	a) Safety Shirt	10 Nos
	b) Safety Trouser	10 Nos
	c) Safety Jacket	10 Nos
	d) Cooling Vest	10 Nos
	e) Gum Boots	10 Nos
34	Personal Fall Arrest System (PFAS) *	02 Nos
35	Tripod *	02 Nos
36	Pulley *	02 Nos
37	Suspended Scaffold *	02 Nos
38	Gas Detector *	02 Nos
39	Plastic Tunnel (Sewer Rescue Drill)	04 Nos
40	Body Harness *	01 No
41	Collecting Breeching *	02 Nos
42	Dividing Breeching *	02 Nos
43	Hydrant Flange *	02 Nos
44	Hydrant Key & Bar (With hydrant Spindle) *	01 No
45	Adopter for Air Store Pressure	02 Nos
46	Hydraulic Pressure Testing Machine *	01 No
47	Sprinklers Head (Bulb Type, Fusible Type) *	02 Nos
48	Safety Belt	01 No
49	Computer System *	06 Nos
50	Computer Table *	06 Nos
51	Computers Chairs *	06 Nos
52	White Board	01 No
53	L.C.D. Projectors	02 Nos
54	UPS 650 VA offline	06 Nos
55	All types of Detectors 1 Pcs. of each	04 Nos
56	Flux meter	06 Nos
57	Dosi meter	01 No
58	Cut model of Fire Extinguisher *	02 Nos
59	Fire Suit	02 Nos
60	Fire Tender (one For the Institute) *	01 No
61	Rescue Van (one For the Institute) *	01No.

*Note :In the above list of tools and equipments, the items bearing star mark are meant to be used for three courses viz Health Safety and Environment, Fireman, Fire Technology and Industrial Safety Management. If a institute is running all the above mentioned trades , items bearing star mark are not required to be purchased separately .