CURRICULUM

FOR THE TRADE OF

ELECTROPLATER

UNDER

APPRENTICESHIP TRAINING SCHEME

सत्यमेव जयते
Government of India

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

CONTENTS

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2. BACKGROUND

2.1 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.

2.2 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.

2.3 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.

3. RATIONALE

(Need for Apprenticeship in ELECTROPLATER trade)

It is generally observed that institutionally trained youth have not produced desired result because training imparted in institutions alone is not enough for acquisition of skills but needs to be supplemented by training in the actual world of work.

The electroplater sector plays a very important part in the finishing process of every component manufactured. It fills the need in an ever expanding and growing electronics, electrical and mechanical industries. The Industrial application of electroplating is a popular choice when corrosion against protection is necessary to prevent the premature of metals materials. Hence the growing in number of electroplating units has increased.

Apprenticeship helps in continually improving skill and performance of an individual. The apprentice gets an opportunity to monitor and analyze the electroplating process and production. The industries have to spend time and money on their training. It has been observed that most of the existing Industrial Training Institutes run by the government and private sector do not have on the job training facilities.

It is therefore needed to interact with the industry to provide on the job training to the Semi skilled workers and also make changes in the curriculum. So to supply the skilled manpower demand, the Apprenticeship Training approach with the revised, industrial friendly curriculum is required.

4. JOB ROLES: REFERENCE NCO/NOS

Brief description of Job roles:

- Carryout Installation, maintenance & repair works of Electrical AC/ DC machinery, lighting circuits and equipments used in industries.
- 5S & Housekeeping awareness and techniques.
- Use, handling and storage of hazardous chemicals.
- Troubleshooting of electrical items used in plating.
- Practice on using fitting, carpentry and sheet metal tools.
- Use of electrical instrument (analog/digital) like voltmeter, Ammeter, Wattmeter, Energy Meter, Wheatstone bridge, oscilloscope, Earth tester, Tong tester, Megger etc to measure to different electrical quantities.
- Carry out Wiring & Earthing System.
- Carry out surface finishing process prior to plating.
- Carry out electroplating process on various metals and metal alloys.
- Carry out electroplating on plastics and other non-metallic surfaces.
- Carry out electroplating on precious metals.
- Carry out electroless nickel and electroless chrome plating.
- Carry out plating according to specific user benefits.
- Carry out Hot dipping process & electroplating (granadising).
- Carry out anaodizing and Galvanizing processes and metal colouring
- Carry out plating on PCB's; heat treatment, conversion coating, masking and stripping process
- Carry out the work to minimize contamination and effluent treatment and other safety control measures
- Quality test for plated work and correction of faults.

Reference NCO & NOS:

i) NCO-2004: 7137.10 (851.10)
ii) NCO-2004: 7241.10 (851.20)
ii) NCO-2004: 7241.20 (851.30)
iii) NCO-2004: 8223.10

5. GENERAL INFORMATION

1. **Name of the Trade** **:** ELECTROPLATER

2. **N.C.O. Code No.** : 8223.10

3. **Duration of Apprenticeship Training (Basic Training + Practical Training):**2years

3.1 For Freshers: Duration of Basic Training: -

a) Block –I : 3 months

b) Block – II : 3 months

Total duration of Basic Training: 6 months

. **Duration of Practical Training (On -job Training): -**

a) Block–I: 9 months

b) Block–II : 9 months

Total duration of Practical Training: 18 months

3.2 For ITI Passed: Duration of Basic Training: - NIL

Duration of Practical Training (On-job Training): 12 Months

4. **Entry Qualification** : Passed in 10th class examination under 10+2 system

5. **Selection of Apprentices:** The apprentices will be selected as per Apprenticeship Act amended time to time.

6. Rebate for Ex-Craftsmen Trainees:- One year rebate for those who have passed **CTS- ELECTROPLATER** Trade.
They will undergo One year On-the-job Training.

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.

6. COURSE STRUCTURE

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

Components of Training	Duration of Training in Months →																							
↓	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Basic Training Block - I																								
Practical Training Block - I																								
Basic Training Block - II																								
Practical Training Block - II																								

7. SYLLABUS

7.1 BASIC TRAINING
(BLOCK – I & II)
DURATION: 06 MONTHS

GENERAL INFORMATION

1) **Name of the Trade** : **ELECTROPLATER**
2) **Hours of Instruction** : 1000 Hrs. (500 hrs. in each block)
3) **Batch size** : 20 nos.
4) **Power Norms** : 16.0 KW
5) **Space Norms** : 98 Sq.m. (For basic Training of Block-I & II)
6) **Examination** : The internal assessment will be held on completion of each Block.
7) **Instructor Qualification** :

i) Degree/Diploma in Electrical Engg./Diploma in Chemical Engg. from recognized university/Board
with one/two year post qualification experience respectively in the relevant field.

OR

ii) NTC/NAC in the trade of Electrician with three year post qualification experience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

8) **Tools, Equipments & Machinery required** : - As per Annexure – I

7.1.1 DETAIL SYLLABUS OF CORE SKILL

A. Block– I
Basic Training

Topic No.	a) Engineering Drawing	Duration (in hours)	b) Workshop Science & Calculation	Duration (in hours)
1	**Engineering Drawing: Introduction and its importance** - Viewing of engineering drawing sheets. Method of Folding of printed Drawing Sheet as per BIS SP:46-2003 **Drawing Instruments** : their Standard and uses - Drawing board, T-Square, Drafter (Drafting M/c), Set Squares, Protractor, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), Pencils of different Grades, Drawing pins / Clips.	**30**	**Unit**: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units.	**20**
2	**Lines :** - Definition, types and applications in Drawing as per BIS SP:46-2003 - Classification of lines (Hidden, centre, construction, Extension, Dimension, Section) - Drawing lines of given length (Straight, curved) - Drawing of parallel lines, perpendicular line - Methods of Division of line segment		**Fractions & Simplification**: Fractions, Decimal fraction, Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems Simplification using BODMAS.	
3	**Drawing of Geometrical Figures**: Definition, nomenclature and practice of - - Angle: Measurement and its		**Square Root** : Square and Square Root, method of finding out square roots, Simple problem using	

	types, method of bisecting. - Triangle -different types - Rectangle, Square, Rhombus, Parallelogram. - Circle and its elements.		calculator	
4	**Lettering and Numbering** as per BIS SP46-2003: - Single Stroke, Double Stroke, inclined, Upper case and Lower case.		**Ratio & Proportion:** Simple calculation on related problems.	
5	**Free Hand sketch:** Hand tools and measuring instruments used in Electroplater trade		**Percentage:** Introduction, Simple calculation. Changing percentage to decimal and fraction and vice-versa.	
6	**Free hand drawing :** - Lines, polygons, ellipse, etc. - geometrical figures and blocks with dimension . - Transferring measurement from the given object to the free hand sketches.		**Material Science** : properties -Physical & Mechanical, Types –Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals, introduction of Iron, Cast Iron, Wrought Iron, Steel, difference between Iron and Steel, Alloy steel, carbon steel, stainless steel, Non-Ferrous metals, Non-Ferrous Alloys.	

B. Block- II
Basic Training

Topic No.	a) Engineering Drawing	Duration (in hours)	b) Workshop Science & Calculation	Duration (in hours)
		30		20
1	**Symbolic Representation** (as per BIS SP:46-2003) of : - Fastener (Rivets, Bolts and Nuts) - Bars and profile sections - Weld, brazed and soldered joints. - Electrical and electronics element - Piping joints and fittings		**Mass ,Weight and Density** : Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density, specific gravity of metals	
2	**Construction of Scales and diagonal scale**		**Work, Power and Energy**: work, unit of work, power, unit of power, Horse power of engines, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.	
3	**Three phase Induction motor** Free hand sketching of Slip-ring and Squirrel cage Induction motor. Typical wiring diagram for drum controller operation of A.C. wound rotor motor.			
4	Drawing the schematic diagram of Autotransformer starter, DOL starter and Star Delta Starter. Drawing the schematic diagram of A.C. motor speed control by SCR /AC Drive.		**Algebra:** Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).	
5	**Distribution of Power** Types of insulator used in over head line. (Half sectional views) Different type of distribution systems and methods of connections. Layout diagram of a substation. Single line diagram of substation feeders.		**Mensuration :** Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle. Volume of solids – cube, cuboid, cylinder and Sphere. Surface area of solids – cube, cuboid, cylinder and Sphere.	
			Trigonometry: Trigonometrical ratios, measurement of angles. Trigonometric tables. Finding height and distance by trigonometry.	

7.1.2 DETAIL SYLLABUS OF PROFESSIONAL SKILLS & PROFESSIONAL KNOWLEDGE

A. Block –I
Basic Training

Week No.	Professional Skills	Professional Knowledge
1	Implementation of various safety measures in the shop floor. Visit to different sections of the Institute. Demonstration of elementary first aid. Artificial Respiration. Practice on use of fire extinguishers. **Occupational Safety & Health.** **Importance of housekeeping & good shop floor practices.** Health, Safety and Environment guidelines, legislations & regulations as applicable. Disposal procedure of waste materials like cotton waste, metal chips/burrs etc. Basic safety introduction, Personal protective Equipment(PPE):- Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message. Preventive measures for electrical accidents & steps to be taken in such accidents. Use of Fire extinguishers.	**Occupational Safety & Health** Basic safety introduction, Personal protection:- Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message. Use of Fire extinguishers. Visit & observation of sections. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard **Soft Skills**: its importance and Job area after completion of training. Introduction of First aid. Operation of electrical mains. Introduction of PPEs. Introduction to 5S concept & its application. Response to emergencies eg; power failure, fire, and system failure.
2	Familiarization with signs and symbols of Electrical accessories.	Fundamental of electricity: Electron theory- free electron, Fundamental terms- Current, Voltage definitions, AC, DC, Phase, Neutral, Earth. Units & effects of electric current.
3	Skinning the cables Demonstration & practice in soldering & brazing, practice in measuring instruments used in electroplating like micrometer, vernier, plug gauges, ring	Solders, flux and soldering technique. Resistors types of resistors & properties of resistors. Introduction of National Electrical Code. Explanation, Definition and properties of conductors, insulators and semi-conductors. Types of wires & cables, standard wire gauge.

	gauges, depth micrometer, hole measuring micrometers. Ammeter, Voltmeter, Thermometer, Thermocouple, Energy meter, Temperature recorders.	Specification of wires & Cables-insulation & voltage grades- Low , medium & high voltage
4	Verification of Ohm's Law, Measuring unknown resistance Verification of laws of series and parallel circuits.	Ohm's Law - Simple electrical circuits and problems. Reading of simple Electrical Layout. Resistors -Law of Resistance. Series and parallel circuits & related calculation. Alternating Current -Comparison and Advantages D.C and A.C. Related terms Frequency, Instantaneous value, R.M.S. value Average value, Peak factor, form factor, sine wave, phase and phase difference. Inductive and Capacitive reactance, Impedance (Z), power factor (p.f). Active and Reactive power. Single Phase and three-phase system etc. Power consumption in series and parallel, P.F. etc. Concept three-phase Star and Delta connection. Line and phase voltage, current and power in a 3 phase circuits with balanced and unbalanced load.
5	Demonstration of trade hand tools. Use, care & maintenance of various hand tools. Practice on installation and overhauling common electrical accessories as per simple Electrical circuit / Layout. Make test board.	Identification of Trade-Hand tools-Specifications Common Electrical Accessories, their specifications in line with NEC 2011-Explanation of switches lamp holders, plugs and sockets. Developments of domestic circuits, Alarm & switches, with individual switches, Two way switch .Security surveillance, Fire alarm, MCB, ELCB, MCCB. Series –parallel testing board & use.
6	Identification of parts of battery. Practice on Battery Charging, Preparation of battery charging, Testing of cells, Installation of batteries, Charging of batteries by different methods. Routine care & maintenance of Batteries, Practice on Earthing-different methods of earthing. Measurement of Earth resistance by earth tester. Testing of Earth Leakage by ELCB and relay.	Chemical effect of electric current-Principle of electrolysis. Faraday's Law of electrolysis Lead acid cell-description, methods of charging-Precautions to be taken & testing equipment, Different types of lead acid cells. Sealed Maintenance free Batteries, Solar battery. Load & back up time calculation. Earthing- Principle of different methods of earthing & selection. i.e. Pipe, Plate, etc Importance of Earthing. Improving of earth resistance Earth Leakage circuit breaker (ELCB).

7	Demonstration of safety aids in electroplating, identification, labelling and storage of chemicals, practice on use of chemicals, cyanides and other poisonous gases; Use of jigs and fixtures and their importance, different materials to be used to make fixtures for different plating, method of racking for electroplating and anodizing, effluent treatment of plating effluents, softening of hard water by different methods, practice on use of electroplating equipments	Safety precautions to be considered in plating shop, Introduction to electroplating, electroplating techniques, definitions of the terms used in electroplating, calculation of surface areas and volumes, specific gravity, properties of metals and non-metals, alloys-their composition and uses; effluent treatment of plating effluents, BOD and COD of effluents.
8 & 9	Practice on- Mechanical cleanings like Sand blasting, Abrasive blasting, scouring, scrubbing, Barrel de-burring and cleaning for different materials like steel, copper, alluminium, brass, silver, gold. Chemical cleaning – Solvent cleaning, Ultrasonic cleaning, Vapour degreasing, alkaline cleaning, pickling, Anodic-Cathodic cleaning, Etching Barrel polishing etc.	Fundamental particles- electron, proton & neutrons, elements, compounds and mixtures, examples; formulas and symbols; chemical reactions, types of chemical reactions, acids, bases and salts with examples, acidity of a solution, alkalility of a solution, solutions, solute, solvent, saturated solutions ,unsaturated solutions, dilute and concentrated solutions, supersaturated solutions, pollution-types, causes and effects, Ionic dissociation-principles of electrolytic dissociation, Faraday's laws-electrochemical series, current density; purity of chemicals, care and maintenance of plating solutions.
10	Emery dressing, grease mopping, polishing and buffing of articles of Iron and steel,cast Iron, aluminium, brass, bronze etc, Burnishing and lapping; barrel polishing Iron and steel articles;scouring and finishing of silver and gold, ultrasonic cleaning,anodic and cathodic cleaning	Abrasives, emery wheels, polishing machines, burnishing-hand and lathe burnishing; tools for polishing – mops and buffs, polishing composition, bobbing grease,wheel composition, types of wheels, grinding and polishing techniques, grinding and polishing techniques, polishing of different metals such as Iron and steel,cast iron, copper,brass, Aluminium, scouring and finishing of gold and silver, barrelling purpose and methods, barreling machines and techniques.
11	Practice in setting up of equipments for copper plating, preparation of copper plating solutions - acid bath and cyanides bath solutions; copper plating on various articles; Electroless copper, testing of copper solutions	Vats, details of rectifiers, position of rectifiers, tubes and rods for Vats, resistance board, heating, light, ventilation, effluents discharge, current efficiency, anodes and cathode efficiency, safety precautions.

12	Practice in setting up of equipments for nickel plating, preparation of nickel plating solutions, nickel-sulphate plating, nickel –sulphamate plating , nickel plating on Mild steel, copper, brass, aluminium articles, electroless nickel plating ,black electroless nickel plating, nickel plating by barrel method	Importance of cleaning, pickling and dipping methods with different solutions ,scratch brushing methods, stripping methods and techniques.
13	Testing of pH value of solutions, test and identifying plating defects by various methods i.e., visual test, thickness test, corrosion test, adhesion test, pores test, Hardness test, Surface roughness test etc. Practice in Stripping of copper and Nickel coating on different base materials and methods. Practice in volumetric analysis of plating solutions, gravimetric analysis, maintenance of plating solutions, carbon treatment.	Copper plating- properties, copper solutions, troubles of copper solutions, factors to be considered in plating, copper plating, defects and causes, application; Nickel plating, electroless nickel plating, trouble shooting application ,process control of plating solutions.
	Assessment/Examination 03days	

B. Block –II
Basic Training

Week No.	Professional Skills	Professional Knowledge
1	Practice in setting up of equipments for chrome plating, Practice preparation of the work and chrome solutions, chrome bright plating on nickel base, hard chrome plating for dies, printing plates, Black chrome plating,barrel chrome plating, Stripping of chrome plating from different base metals.	Properties of chromium, types of chrome solutions, lead anodes, physical factors like density, temperature etc., equipments, significant of bright and hard chrome plating on different metals, advantages and disadvantages, operating conditions, black chrome plating, barrel chrome plating, Chrome plating on stainless steel, post plating treatment, Chrome plating, defects, causes and remedies.
2 & 3	chrome passivation chrome bright plating on nickel base,hard chrome plating for dies, printing plates, Black chrome plating,barrel chrome plating, chrome passivation, preparation of cadmium solutions,bright cadmium plating,maintenance of the plating solutions, post plating treatment-chrome acid dip	Preparation of cadmium solutions, cadmium plating on various metals, Blue passivation, Dichromate passivation, Limitation of temperature after Dichromate passivation, Nitric Acid dip. Quality tests and inspection of Cadmium plating like visual, Thickness, Corrosion resistance, Surface finish etc defects, causes and remedies.
4	Practice in setting up of equipments for silver plating Preparation of articles made of copper, nickel, steel for silver plating	Properties of silver, significant of Silver plating on different metals, advantages and disadvantages. Preparation of Silver solutions, Silver plating on various metals, maintenance of the plating solutions, post plating treatment Silver passivation (Silchrome). Quality tests and inspection like visual, Thickness, Corrosion resistance, Surface finish etc. defects, causes and remedies.
5	Practice in preparation of gold solutions, gold plating, maintenance of gold, practice in masking	Properties of Gold, significant of Gold plating on different metals, advantages and disadvantages. Preparation of Gold solutions, Gold plating on various metals, maintenance of the plating solutions, post plating treatment like lacquering etc. Quality tests and inspection of Gold plating like visual, Thickness, Surface finish etc. Defects, causes and remedies.
6	Practice in preparing brass solution, preparation of work, brass plating for rubber adhesion, barrel plating	Properties of Brass, significant of Brass plating on different metals, advantages and disadvantages. Preparation of Brass solutions, Brass plating on various metals, maintenance of the plating solutions, post plating treatment like lacquering etc. Quality tests and inspection of Brass plating

		like visual, Thickness, Surface finish etc. Defects, causes and remedies. Stripping of Brass plating from different base metals.
7 & 8	Practice in preparing zinc solution, preparation of work, various zinc plating, barrel zinc plating, practice in stripping, stopping off, passivation of electrodeposits	Properties of zinc, Significant of Zinc plating on different metals, advantages and disadvantages. Preparation of Zinc solutions, Zinc plating on various metals, maintenance of the plating solutions, post plating treatment like Blue passivation, Dichromate passivation, Nitric acid dip etc. Quality tests and inspection.
9	Practice in preparing tin solution, setting up of tin plating bath,tin and tin alloy plating, Practice in conversion coating on different materials such as aluminium, zinc,copper, steel, magnesium alloys	Properties of Tin, preparation of Tin solutions, setting up of tin plating bath, tin and tin alloy plating. Tin plating on various metals, maintenance of the plating solutions, Quality tests and inspection of Tin plating like visual, Thickness, Solder-ability, Surface finish etc. Defects, causes and remedies in Tin plating. Stripping of Tin plating from different base metals.
10	Practice in preparing solution for chrome anodizing, sulphuric acid anodizing, oxalic acid anodizing, Practice in metal colouring, , Alodine (Alochrome) aluminium and alloys, chromating of magnisium alloys, practice in brass etching, Blackening on steel, brass and copper.	Aluminium anodizing, chromic acid, sulphuric acid, oxalic acid anodizing ,its application, metal colouring, plating on non-metals, conversion coating, chemical etching, lacquering, plastic and other non-metalic plating, phosphating (Zinc and Manganese) on ferrous metal.
11	Practice in visual testing of plated articles, determination of thickness of plating ,adhesion test, corrosion test, Practice in testing and identifying pores strength, salt spray test, BNF test	Inspection of plated surfaces, visual test, BNF test, salt spray test, corrosion test.
12	Installation of machinery for electroplating shops, selection of equipments,layout with details of plant tools and machineries	Electroplating shop layout, factors to be considered- tools, machines, raw materials, waste disposal, selection of vats and anodes
13	Industrial visit/Project work	
	Assessment/Examination 03days	

7.1.3 EMPLOYABILITY SKILLS

GENERAL INFORMATION

1)	**Name of the subject**	**:**	**EMPLOYABILITY SKILLS**
2)	**Applicability**	**:**	ATS- Mandatory for fresher only
3)	**Hours of Instruction**	**:**	**110 Hrs. (55 hrs. in each block)**
4)	**Examination**	**:**	The examination will be held at the end of two years Training by NCVT.
5)	**Instructor Qualification**	**:**	

i) MBA/BBA with two years experience or graduate in sociology/social welfare/Economics with two years experience and trained in Employability skill from DGET Institute.

And

Must have studied in English/Communication Skill and Basic Computer at 12th /diploma level

OR

ii) Existing Social Study Instructor duly trained in Employability Skill from DGET Institute.

7.1.3.1 SYLLABUS OF EMPLOYABILITY SKILLS

A. Block – I
Basic Training

Topic No.	Topic	Duration (in hours)
	English Literacy	**15**
1	**Pronunciation :** Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)	
2	**Functional Grammar** Transformation of sentences, Voice change, Change of tense, Spellings.	
3	**Reading** Reading and understanding simple sentences about self, work and environment	
4	**Writing** Construction of simple sentences Writing simple English	
5	**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.	
	I.T. Literacy	**15**
1	**Basics of Computer** Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.	
2	**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.	
3	**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	
4	**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 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.	

	Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.	
	Communication Skill	**25**
1	**Introduction to Communication Skills** Communication and its importance Principles of Effective communication Types of communication - verbal, non verbal, written, email, talking on phone. Non verbal communication -characteristics, components-Para-language Body - language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort. Case study/Exercise	
2	**Listening Skills** Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active Listening Skills.	
3	**Motivational Training** Characteristics Essential to Achieving Success The Power of Positive Attitude Self awareness Importance of Commitment Ethics and Values Ways to Motivate Oneself Personal Goal setting and Employability Planning. Case study/Exercise	
4	**Facing Interviews** Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview	
5	**Behavioral Skills** Organizational Behavior Problem Solving Confidence Building Attitude Decision making Case study/Exercise	

B. Block– II
Basic Training

Topic No.	Topic	Duration (in hours)
	Entrepreneurship skill	**15**
1	**Concept of Entrepreneurship** **Entrepreneurship**- Entrepreneurship - Enterprises:-Conceptual issue Entrepreneurship vs. Management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.	
2	**Project Preparation & Marketing analysis** Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of Product Life Cycle (PLC), Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.	
3	**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.	
4	**Investment Procurement** Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.	
	Productivity	**10**
1	**Productivity** Definition, Necessity, Meaning of GDP.	
2	**Affecting Factors** Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.	
3	**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.	
4	**Personal Finance Management** Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.	
	Occupational Safety, Health & Environment Education	**15**
1	**Safety & Health** Introduction to Occupational Safety and Health importance of safety and health at workplace.	
2	**Occupational Hazards** Basic Hazards, Chemical Hazards, Vibro-acoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.	

3	**Accident & safety** Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.	
4	**First Aid** Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person	
5	**Basic Provisions** Idea of basic provision legislation of India. of safety, health, welfare under legislation of India.	
6	**Ecosystem** Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.	
7	**Pollution** Pollution and pollutants including liquid, gaseous, solid and hazardous waste.	
8	**Energy Conservation** Conservation of Energy, re-use and recycle.	
9	**Global warming** Global warming, climate change and Ozone layer depletion.	
10	**Ground Water** Hydrological cycle, ground and surface water, Conservation and Harvesting of water	
11	**Environment** Right attitude towards environment, Maintenance of in -house environment	
	Labour Welfare Legislation	**5**
1	**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.	
	Quality Tools	**10**
1	**Quality Consciousness :** Meaning of quality, Quality Characteristic	
2	**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.	
3	**Quality Management System :** Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.	
4	**House Keeping :** Purpose of Housekeeping, Practice of good Housekeeping.	
5	**Quality Tools** Basic quality tools with a few examples	

7.2 PRACTICAL TRAINING (ON-JOB TRAINING)
(BLOCK – I & II)
DURATION: 18 MONTHS (9 months in each block)

GENERAL INFORMATION

1) **Name of the Trade** : **ELECTROPLATER**
2) **Duration of On-Job Training** : As per Apprenticeship Act amended time to time.
3) **Batch size** : 20
4) **Examination** : i) The internal assessment will be held on completion of each block
   ii) NCVT exam will be conducted at the end of 2nd year.
5) **Instructor Qualification** :

i) Degree/Diploma in Electrical Engg./Diploma in Chemical Engg. from recognized university/Board
With one/two year post qualification experience in the relevant field.

OR

ii) NTC/NAC in the trade of Electrician / Power Electrician with three year post qualification experience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

6) **Tools, Equipments & Machinery required** : - As per Annexure – II

7.2.1 BROAD SKILL COMPONENT TO BE COVERED DURING ON-JOB TRAINING

A. BLOCK – I

Week No.	Professional Skills
1	Implementation of various safety measures on the shop floor, demonstration on first aid, practice on use of fire extinguishers, signs and posters of 5S, awareness and techniqunes, good housekeeping, visual control, reduce waste, process improvement tool.
2	Demonstration of trade hand tools and machineries, its specifications, use, care and maintenance of hand tools, practice on soldering and brazing.
3	Identification and use of wiring accessories, practice on installation and overhauling common electrical accessories. Fixing of switches, holder plugs, wiring practice etc. in wooden/PVC/Metallic boards, Troubleshooting of electrical items used in plating
4	Use, handling and storage of hazardous chemicals. Vat / barrell diagram showing connections for copper and nickel plating and other electroplating equipments and layout.
5	Labeling and storage of chemicals, practice on use of chemicals, cyanides and other poisonous gases; effluent treatment of plating-effluents, softening of hard water by different methods,
6	Practice on surface cleaning of articles by different methods- scouring, scrubbing, alkaline cleaning, etching, degreasing , pickling, dipping, vapor degreasing methods.
7	Polishing and buffing of articles of Iron and steel, cast Iron, aluminium, brass, bronze etc., Burnishing and lapping; barrel polishing of Iron and steel articles; scouring and finishing of silver and gold, ultrasonic cleaning, anodic and cathodic cleaning.
8	Practice copper plating on different metals by using acid bath, cyanides bath, pyrosulphate solutions etc.
9	Practice nickel plating on different metals by using nickel-sulphate, nickel –sulphamate baths, electroless nickel plating , black electroless nickel plating, nickel plating by barrel method
10	Copper bath and nickel bath solution maintenance and Hull cell tests,testing of pH value of solutions and other parameters- Filtration, temperature & density etc
11	Solution treatment for nickel plating and effluent treatment of plating solutions.
12	Quality test for copper and nickel plated work i.e. thickness test, corrosion test, adhesion test, pores test etc.
13	Common defects, causes and remedies in copper and nickel bath.
14	Practice in Lacquering by different methods
15	Practice in volumetric analysis of plating solutions, gravimetric analysis.
16	Carry out plating on PCB's; heat treatment, conversion coating, masking and stripping process
	Project Work
	REVISION
	Assessment/ Examination

B. BLOCK – II

Week No.	Professional Skills
1	Practice preparation of the work and chrome solutions, chrome bright plating on nickel base,hard chrome plating for dies, printing plates, Black chrome plating, barrel chrome plating
2	Chrome passivation, chrome bright plating on nickel base, hard chrome plating for dies, printing plates, Black chrome plating, defects ,causes and remedies
3	Preparation of cadmium solutions, cadmium plating on various metals, maintenance of the plating solutions, post plating treatment-chrome acid dip, defects, causes and remedies.
4	Practice silver plating on articles made of copper, nickel, and steel for silver plating.
5	Practice in preparation of gold solutions, gold plating, maintenance of gold, practice in masking
6	Practice in preparing brass solution, preparation of work, brass plating fault correction
7	Practice in zinc plating, barrel zinc plating, practice in stripping
8	Practice in preparing tin solution, setting up of tin plating bath, tin and tin alloy plating
9	Practice in preparing solution for chrome anodizing, sulphuric acid anodizing, oxalic acid anodizing
10	Practice in metal colouring, bronzing, practice in brass etching
11	Practice in conversion coating on different materials such as aluminium, zinc,copper, steel, magnesium alloys, Hot dipping process & electroplating (granadising). PCB plating, heat treatment, stripping of different plating and conversion coating
12	Practice in visual testing of plated articles, determination of thickness of plating, adhesion test, corrosion test, calculation of current & time, solution composition etc, Practice in testing and identifying pores strength, salt spray test, BNF test
13	Installation of machinery for electroplating shops, selection of equipments,layout with details of plant tools and machineries
14	**Project Work**
	REVISION
	Examination

8. ASSESSMENT STANDARD

8.1 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 to be given while assessing for team work, avoidance/reduction of scrape/wastage and disposal of scarp/wastage as per procedure, behavioral attitude and regularity in training.

The following marking pattern to be adopted while assessing:

a) Weightage in the range of 60-75% to be allotted during assessment under following performance level:

For 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.

In this work there is evidence of:

- good skill levels in the use of hand tools, machine tools and workshop equipment
- many tolerances while undertaking different work are in line with those demanded by the component/job.
- a fairly good level of neatness and consistency in the finish
- occasional support in completing the project/job.

b) Weightage in the range of above 75%- 90% to be allotted during assessment under following performance level:

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.

In this work there is evidence of:

- good skill levels in the use of hand tools, machine tools and workshop equipment
- the majority of tolerances while undertaking different work are in line with those demanded by the component/job.
- a good level of neatness and consistency in the finish
- little support in completing the project/job

Weightage in the range of above 90% to be allotted during assessment under following performance level:

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.

In this work there is evidence of:

- high skill levels in the use of hand tools, machine tools and workshop equipment
- tolerances while undertaking different work being substantially in line with those demanded by the component/job.
- a high level of neatness and consistency in the finish.
- minimal or no support in completing the project

8.2 FINAL ASSESSMENT- ALL INDIA TRADE TEST (SUMMATIVE ASSESSMENT)

SUBJECTS	Marks	Sessional Marks	Full Marks	Pass Marks	Duration of Exam.
Practical	300	100	400	240	**08 hrs.**
Trade Theory	100	20	120	48	3 hrs.
Workshop Cal. & Sc.	50	10	60	24	3 hrs.
Engineering Drawing	50	20	70	28	4 hrs.
Employability Skill	50		50	17	2 hrs.
Grand Total	**550**	**150**	**700**	**-**	

Note: - The candidate pass in each subject conducted under all India trade test.

9. FURTHER LEARNING PATHWAYS

Employment opportunities:

On successful completion of this course, the candidates shall be gainfully employed in the following industries:

1. Metal plating industries.
2. Electronic and Electrical component manufacturing companies.
3. Central & State Government and Public sector
4. Private industries in India.
5. International career opportunities
6. Self employment

ANNEXURE – I

TOOLS & EQUIPMENT FOR BASIC TRAINING

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

TRADE: ELECTROPLATER

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

A : TRAINEES TOOL KIT:-

Sl. No.	Name of the items	Quantity
1	Steel Tape, 15 m length	21 nos.
2	Plier Insulated, 150 mm	21 nos.
3	Plier Side Cutting, 150 mm	21 nos.
4	Screw Driver, 100 mm	21 nos.
5	Screw Driver, 150 mm	21 nos.
6	Electrician Connector, screw driver insulated handle thin stem, 100 mm	21 nos.
7	Heavy Duty Screw Driver , 200 mm	21 nos.
8	Electrician Screw Driver thin stem insulated handle, 250 mm	21 nos.
9	Punch Centre , 150 mm X 9 mm	21 nos.
10	Knife Double Bladed Electrician	21 nos.
11	Neon Tester	21 nos.
12	Steel Rule 300 mm	21 nos.
13	Hammer, cross peen with handle	21 nos.
14	Hammer, ball peen With handle	21 nos.
15	Gimlet 6 mm.	21 nos.
16	Bradawl	21 nos.
17	Scriber (Knurled centre position)	21 nos.
18	Pincer 150 mm	21 nos.

19	Digital multimeter	21 nos.

B : TOOLS INSTRUMENTS AND GENERAL SHOP OUTFITS

Sl. No.	Name of the items	Quantity (Indicative)
1	C- clamp, 100mm, 150mm, 200mm	2 Nos. each
2	Adjustable spanner, 150mm, 300mm	2 Nos. each
3	Blow lamp, 0.5 ltr	1
4	Melting pot	1
5	Ladel	1
6	Chisel cold firmer, 25mm x 200 mm	2
7	Chisel 25mm & 6 mm	2 Nos. each
8	Hand drill machine	2
9	Portable electric drill machine, 12 mm capacity	1
10	Pillar Electric Drill machine, 12 mm capacity	1
11	Allen key set	2 sets
12	Oil can 0.12 ltr	1
13	Grease gun	1
14	Out side Micrometer	2
15	Motorised Bench grinder	1
16	Rawl plug tool & bit	2 sets
17	Pulley puller	2
18	Bearing puller	2
19	Pipe vice	2
20	Thermo meter 0-100 deg C	1
21	Scissors blade 150mm	2
22	Crimping tool	2 sets
23	Wire stripper 20 Cm	2
24	Chissel cold flat 12mm	2
25	Mallet hard wood 0.5Kg	2
26	Mallet hard wood 1 Kg	2
27	Hammer extractor type, 0.4 Kg	2
28	Hacksaw frame, 200mm & 300mm adjustable	2 each
29	Try square, 150 mm blade	2
30	Outside & inside divider caliper	2 each
31	Pliers flat nose 150mm	4
32	Pliers round nose, 100 mm	4
33	Tweezers, 100mm	4
34	Snip straight & bent, 150mm	2 each
35	Double ended spanner set metric	2 sets
36	HSS drill bit set(2-12mm)	4 sets

37	Plane, smoothing cutters 50mm	2
38	Gauge, wire imperial	2
39	File, flat 200mm 2nd cut	8
40	File half round 200 mm 2nd cut	4
41	File round 200mm 2nd cut	4
42	File flat 150mm rough	4
43	File flat 250mm bastard	4
44	File flat 250mm smooth	4
45	File Rasp half round 200 mm bastard	4
46	Soldering iron, 25 W, 65 W	2 each
47	Copper bit soldering iron 0.25 kg	2
48	Desoldering gun	4
49	Hand vice 50mm jaw	4
50	Bench vice 100mm jaw	6
51	Pipe cutter to cut pipes upto 5cm dia	2
52	Stock & die set for 20mm to 50 mm GI pipe	1
53	Stock & dies conduit	1
54	Ohm meter; series & shunt type	2 each
55	Multimeter (analog), 0-1000 M ohm, 2.5 to 500V	2
56	Digital Multimeter	4
57	AC voltmeter MI 0-500V	2
58	Milli Voltmeter centre zero 100-0-100 mV	1
59	DC milli Ammeter 0-500 mA	1
60	Ammeter MC 0-5A, 0-25A	1 each
61	AC Ammeter MI 0-5A, 0-25A	1 each
62	KiloWatt meter 0-1-3 KW	1
63	AC Energy meter, single phase 5A, 3 ph 15 A	1 each
64	Power factor meter, single phase	1
65	Frequency meter	1
66	Flux meter	1
67	DC power supply 0-30V, 2 Amp	2
68	Rheostats 0-1 ohm 5A, 0-10 ohm 5A, 0-25 ohm 1A, 0-300 ohm 1A	1 each
69	Digital Tachometer	1
70	Growler	1
71	Tong tester / clamp meter 0-100 A AC	1
72	Meggar 500V	1
73	Oscilloscope dual trace, 30 MHz	1
74	Function Generator	1
75	Hygrometer	1
76	Lux meter	1
77	Hydro meter	1
78	Current transformer, 415 V, 50 Hz , CT Ratio 10/5A,	1

79	Potential Transformer, 415/110 V	1
80	Wood Saw, 250 mm	1
81	Tenon Saw	1
82	Guarded Test Lamp	1

C : GENERAL TOOLS & MACHINERY INSTALLATIONS:-

Sl. No.	Name of the items	Quantity
1	Canvas apron	21
2	Respirators	21
3	Rubber gloves	21
4	Rubber Gum boots	21
5	First aid box	21
6	Goggles	21
7	Rubber/Leather Apron	21
8	Hand vice(50mm jaw)	9
9	File flat 200mm,2nd cut	13
10	File flat 200mm smooth	13
11	Cutting plier insulated 200mm	21
12	Brush hand scratch	21
13	Brush circular brass	21
14	File 2nd cut half round 150mm	21
15	File round 2nd cut 200mm	21
16	File round 200 mm smooth	21
17	Weigh Balance m/c , Electronic 5kg capacity.	1
18	Hydrometer with syringe	4
19	Thermometer (0 to 100)	5
20	Glue pot (5kg capacity)	2
21	Oil can 500ml	2
22	Exhaust fan 1 phase	2
23	Work bench	4

24	Voltmeter 0-30V DC Digital	4
25	Ammeter MC 0-300 A Digital	4
26	Ammeter MC 0-2000mA	4
27	Adjustable resistance board with ammeter & voltmeter	4
28	PVC Polypropylene (PP) Vat/ Tank with SS stand for nickel , copper, brass, silver,tin,zinc,cadmium,(L-2ft B-1.5ft ht-1.5ft) anodizing etc	1
29	Perforated barrel (10 kg capacity)	2
30	Cleaning tank (L-2ft b-1.5ft ht-1.5ft)made out of hard Polypropylene (PP)	5
31	Dust & spray proof polishing machine 1phase 250V/5A	1
32	Dust & spray proof polishing Machine 3phase 440v/15A	1
33	Nickel comparator test set Digital pH meter Table top type	1
34	Buffing machine with spindle and roller bearing motorised heavy duty , 3 phase 440V 15 Amps. Bench Grinder and portable angle grinder hand type 1 phase 3 phase 440V 15 Amps. Bench Grinder and portable angle grinder hand type 1 phase	1
35	Electroplating rectifiers, 3 phase 380/440V 50 c/s AC supply 16 Volts DC with an output of 500Amps 300A Dc voltages adjustable from 3.5 0 to 16 20V with voltage control 63 steps of load complete with required meter panel sand change over switch 3 phase 380/440V 50 c/s AC supply 16 Volts DC with an output of 500Amps 300A Dc voltages adjustable from 3.5 0 to 16 20Vwith voltage control 63 steps of load complete with required meter panel sand change over switch	1
36	AC to DC Motor Generator set for electroplating shop.	1
37	Induction Motor: 3 ph, 5HP, 440V	1
38	Plain steel lined VAT	5
39	Rubber lined VAT	5
40	Fire extinguishers (chemical)	4
41	Heating coil (copper, lead titanium /suitable material for long life) 1kw length 10/12”	5
42	Work tables (wooden) 10ft by 8ft 5ft by 2ft	2
43	Safety charts (chemical / electrical)	10
44	Mechanical Air agitation unit	1
45	Centrifugal Dryer	1
46	Cartridge solution filter	1
47	Plastic siphon 12mm dia	2
48	Hull cell unit (complete set for chemical analysis)	2

49	BNF jet test apparatus Salt spray testing chamber for quality testing of plated surface	1
50	Chromium plating tank made out of Antimonial lead lining with reinforced glass lining. , L-2ft,b-1.5ft,ht-1.5ft	5

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.

C1. FURNITURE :

Sl. No.	Name of the items	Quantity
1	Instructor's table	1
2	Instructor's chair	2
3	Metal Rack 100cm x 150cm x 45cm	4
4	Lockers with 16 drawers standard size	1
5	Almairah 2.5 m x 1.20 m x 0.5 m	1
6	Black board/white board	1

INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING DRAWING

TRADE: ELECTROPLATER

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

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

2) Infrastructure:

A : TRAINEES TOOL KIT:-

Sl. No.	Name of the items	Quantity (indicative)
1.	Draughtsman drawing instrument box	20
2.	Set square celluloid 45^0 (250 X 1.5 mm)	20
3.	Set square celluloid 30^0-60^0 (250 X 1.5 mm)	20
4.	Mini drafter	20
5.	Drawing board (700mm x500 mm) IS: 1444	20

B : FURNITURE REQUIRED

Sl. No.	Name of the items	Quantity (indicative)
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

ANNEXURE – II

TOOLS & EQUIPMENT FOR ON-JOB TRAINING

INFRASTRUCTURE FOR PROFESSIONAL SKILLS & PROFESSIONAL KNOWLEDGE

TRADE: ELECTROPLATER

For Batch of 20 APPRENTICES

Actual training will depend on the existing facilities available in the establishments. However, the industry should ensure that the broad skills defined against On-Job Training part (i.e. 9 months + 9 months) are imparted. In case of any short fall the concern industry may impart the training in cluster mode/ any other industry/ at ITI.

ANNEXURE-III

GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS

1. Due care to be taken for proper & inclusive delivery among the batch. Some of the following some method of delivery may be adopted:

A) LECTURE
B) LESSON
C) DEMONSTRATION
D) PRACTICE
E) GROUP DISCUSSION
F) DISCUSSION WITH PEER GROUP
G) PROJECT WORK
H) INDUSTRIAL VISIT

2. Maximum utilization of latest form of training viz., audio visual aids, integration of IT, etc. may be adopted.

3. The total hours to be devoted against each topic may be decided with due diligence to safety & with prioritizing transfer of required skills.