CURRICULUM

FOR THE TRADE OF

OPERATOR COAL HANDLING EQUIPMENTS

UNDER

APPRENTICESHIP TRAINING SCHEME

2017

सत्यमेव जयते
Government of India

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

CONTENTS

1. ACKNOWLEDGEMENT

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1. TATA Steel, Jamshedpur

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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 **Operator Coal Handling Equipments** trade)

1. Perform preventive maintenance and repairs to the coal handling and conveying equipment at the CHPP.
2. Operate the ash unloading equipment and drive the hauling trucks to dispose of the coal.
3. Ensure the coal conveying equipment including the unloader, crusher, elevators, coal car shakers, coal pullers and coal storage area are properly maintained and available for plant operations.
4. Incumbent must be able operate a coal car mover into position over a grizzly by means of an electrically operated capstan and continuous car puller cable.
5. Capable of releasing locking devices on hopper doors of cars to allow coal to fall into grizzly.
6. Frequently during winter months, hand shovels coal that has stuck to the sides and bottoms of cars, and uses picks or heavy bars to break up oversize lumps of frozen coal.
7. Starts and operates boiler bunker conveyors, belt conveyors, elevator conveyors, crusher magnetic separator and pan feeder conveyor in sequence of local controls on each individual piece of equipment and/or panel board controls. Operates by-pass gates on bins, under-bunker reclaiming conveyor, railroad car loader or outside storage area.
8. Incumbent must know and understand the entire coal/ash handling systems in the plant.
9. Continuously monitor and inspect coal/ash handling equipment before and during operations to assure adequate coal supply for boilers and prevent spill over of coal inside plant.
10. Constantly monitor bunkers and storage bins for sign of overheated coal so that it can be removed before spontaneous combustion occurs. Participate in cleaning and washing of plant areas and equipment to prevent fires or explosions from coal dust accumulations.
11. Maintain accurate daily records of coal received and unloaded.
12. Collect gross samples of incoming coal shipments for analysis.
13. Serve as a member of a coal handling crew.

4. JOB ROLES: REFERENCE NCO

Brief description of Job roles:

Washing Plant Operator, Coal operates different machines and equipment for sizing, cleaning, washing and preparing coal for sale or further processing. Checks operating condition of plant, machines and equipment, such as conveyor, crusher, agitator, elevator, wash box, blower, pump, feeder screen, core and refuse gate. Sets and adjusts them as necessary to have desired pulsation, correct performance, proper control of air, water and coal, etc. by observing readings on different meters and gauges and by regulating values on control panel. Adjusts flow of raw coal through them to separate slate rock and other impurities. Operates cone to mix sand and water in proper proportions to ensure correct specific gravity and observes operation. Tests sample of processed coal by weighing and simple physical and chemical tests to ensure correct percentage of ash content, and minimum rejection of usable coal. May conduct repairs of machinery. May perform only a portion of above duties and be designated as RAW COAL SECTION OPERATOR, FEED OPERATOR, CONE OPERATOR, REFUSE, GATE OPERATOR, etc. according to operation performed or machine handled.

Perform TPM (Total Production Management), TQM (Total Quality Management) and record keeping system.

Reference NCO:

i) **NCO-2015: --** 8112.0600

5. GENERAL INFORMATION

1. **Name of the Trade** **: OPERATOR COAL HANDLING EQUIPMENTS**

2. **N.C.O. Code No.** : **NCO-2015:** --8112.0600

3. **Duration of Apprenticeship Training (Basic Training + Practical Training):** 15 Months

4. **Duration of Basic Training**: -

a) Block –I : 3 months

Total duration of Basic Training: 3 months

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

a) Block–I: 12 months

Total duration of Practical Training: 12 months

6. **Entry Qualification** : Passed 10^{th} Class Exam.

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

8. **Rebate for ITI passed trainees** : NIL

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	4-15
Basic Training	Block– I	-----
Practical Training (On - job training)	----	Block – I

Components of Training ↓	Duration of Training in Months →														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Basic Training Block - I															
Practical Training Block - I															

7. SYLLABUS

7.1 BASIC TRAINING

(BLOCK – I)

DURATION: 03 MONTHS

GENERAL INFORMATION

1) **Name of the Trade** : **OPERATOR COAL HANDLING EQUIPMENTS**
2) **Hours of Instruction** : 500 Hrs.
3) **Batch size** : 20
4) **Power Norms** : 3 KW for Workshop
5) **Space Norms** : -- Sq. m.
6) **Examination** : The internal assessment will be held on completion of each Block.
7) **Instructor Qualification** :

i) Degree/Diploma in **Mechanical** 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 **Operator Coal Handling Equipments** 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)
		30		**20**
1.	Introduction to Engineering drawing, its importance and uses in engineering fields. Simple definitions of Points, Lines, Parallel straight lines.		Applied workshop problems involving simple addition, subtraction, multiplication, division and common fractions.	
2.	Geometrical construction of Square, Rectangle, Triangle, Circle, Polygons, etc.		Science- Definition, Nomenclature, various branches, significance and definitions of important terms.	
3.	Drawing different types of lines.		Rounding of decimal values, use of approximation.	
4.	Free hand sketch of Hand tools used in the trade.		Units – Definition, fundamental & derived units, system of units- FPS, CGS, MKS and SI units of some important parameters- Length , mass, time, density, current, voltage, pressure etc. Unit conversion.	
5.	Screw Threads – Forms of Various Screw threads used in general in the industry – Nomenclature, convention		Workshop problems related to average.	
6.	Fastening Devices – Temporary and Permanent. Meaning and difference. Temporary Device – Hexagonal Bolt, Nut, Check Nut, Washer.		Workshop problems related to percentage.	
7.	Different Methods of Preventions of rotation of Bolts - Check nut, Square headed bolt, Square headed bolt with square neck, cup headed bolt, Eye bolt, counter sunk headed bolt, rag bolt, etc.		Workshop problems related to ratio and proportion.	
8.	Different Methods of locking of nuts :- a) Lock nuts, b) Split pin, c) Slotted nut , d) Symmonds nut, e) Castle nut**, f**) Wings nut, etc.		Workshop problems related on time & work.	

9.	Permanent Fastening Devices- Rivets – different parts and their types Different types of rivet heads.		Profit & Loss and problems concerning to workshop practices.	
10.	Rivets Joints – Lap joint and Butt or Strap joint. Lap Joint – a) Single Riveted, b) Double riveted, i) Chain, ii) zig – zag Butt Joint – a) Single plate or strap, b) Double plate or strap		Properties of Matter- Different types of Properties of Matter e.g. Mechanical, Electrical, Chemical, Magnetic.	
11.	Keys and Cotter Joints, Difference between Keys and Cotters, Different types of Keys.		Properties of Matter (Mechanical) - Tenacity, Toughness, Malleability, Ductility, Elasticity, Plasticity, Brittleness, Hardness (concept & definition)	
12.	---		Properties and uses of copper, zinc, lead, tin, aluminum, brass, bronze, solder, bearing metals, timber, and rubber.	
13.	---		Engineering Material- Introduction, classification, Metallic- Non metallic material, physical and mechanical properties,	
14.	---		Heat & temperature- Definition and its importance. Scales of Temperature, e.g. Fahrenheit, Centigrade, Kelvin- relationship between them.	
15.	---		Transmission of heat- Conduction, Convection and Radiation. Examples from Industries (concept & definition)	
16.	---		Transmission of Power and motion of Belt and Pulleys:- Driver and Follower – Open and Cross belt system of belt drives. Velocity ratio. Power Transmission by belt – Problems	

7.1.2 DETAIL SYLLABUS OF PROFESSIONAL SKILLS & PROFESSIONAL KNOWLEDGE

A. Block –I

Basic Training

Week No.	Professional Skills	Professional Knowledge
1.	Safety: - its importance, classification, personal, general, workshop and job safety. Occupational health and safety. 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. Importance of housekeeping & good shop floor practices. Disposal procedure of waste materials like cotton waste, metal chips/burrs etc. Fire& safety: Use of Fire extinguishers. Safety regarding working with different types of steam and its First-Aid. Drill on fire fighting & safety	Safety Precautions to be followed at site. Fire precautions causes and types of fire, precaution against outbreak of fire. Fire extinguisher types and uses. Proper centering erection, proper scaffolding making & precautions to be taken while working at higher attitudes and during hot repair. Precautions to be followed in Gas hazardous area. Precaution during dismantling.
2.	a. Preparation of major equipment list b. Dos and don'ts c. Utility & potential of major equipments d. Material flow diagram for CHP e. Safety precaution during handling of coal & use of PPEs. f. Cost of different types of coal & wastage control.	a. Coke making process, Cost & sensitivity analysis, Pollution control equipments & norms b. Familiarization with different equipment of Coal Handling Plant(CHP) c. General safety d. All safety devices in CHP.
3.	-Do-	e. Function of different equipment in CHP f. Study of material flow diagram of CHP g. Safety in material handling h. Financial impact of coal on steel making, Concept of Demurrage i. Concept of Blending and Averaging j. Monsoon Preparations

4.	**Video demo of the Operation of Wagon Tippler process.**	a. Operation of Wagon Tippler i) Technical data (Specification) ii) Types of Wagon Tipplers iii) Safety to man & machines iv) Importance of load setting b. Operation of Wagon Chargers i) Technical data ii) Types of Wagon Chargers iii) Safety to man & machines iv) Importance of smooth running of wagon Chargers
5.	Practice on Drives of Tipplers, side arm charger, beetle chargers and feed belts.(Involving different switches & safety devices)	c. Introduction to Drives of Tipplers, Side Arm Charger, Beetle Chargers & Feed Belts d. Introduction to function of different limit switches & other safety devices e. Log Book entry
6.	**Video demo of the Operation of Stackers process.**	Operation of Stackers i)Technical data ii) Quality Parameters iii) Types of Stackers iv) Safety to man & machines while operating Stackers v) Importance of averaging vi) Factor affecting averaging vii) Functions of different limit and safety switches. viii) Introduction to Material Conveying system. ix) Log book entry
7.	**Video demo of the Operation of Reclaimer process.**	Operation of Reclaimer i) Technical data ii) Types of Reclaimers iii) Safety to man & machines during equipment operation. iv) Importance of proper loading of conveyor & spillage control. v) Importance of adherence to SOP vi) Functions of different limit switches, safety switches & drives vii) Introduction to Material Conveying system. viii) Log book entry

8.	Practice on Hammer crushers.(Involving different types of crusher, hammer, machines etc.)	a. Operation of Hammer Crusher i) Technical data ii) Types of Crushers iii) Types of Hammers iv) Safety to man & machines while operating Crushers. v) Milling indices & desired Crushing
9.	**Video demo of blending of coal & operation of pneumatic classifiers process.**	b. Importance of Blending of coal & Operation of Pneumatic Classifiers i) Technical data ii) Parts of Pneumatic Classifiers iii) Quality of input coal and its blending iv) Quality of blended coal v)Parameters of Classifier iv) Safety to man & machines in case of classifiers Operations c. Introduction to Drives of Crushers, Classifiers, Conveyors, quality control system d. Log book entry
10.	**Video demo of related process.** Practice on Conveying system.(Involving different types of conveying)	a. Introduction to Conveying Systems i. Types of conveyors ii. Design features iii. Weigh Feeders b. Drives of conveyors c. Transfer of material from one conveyor to another d. General layout of conveyors e. Various parts of a conveyor f. Conveyor related safety aspects g. Monsoon Hazards & Preparations h. General safety
11-12	**Video demo of self-combustion process.** **Video demo of safety devices in conveyor system (flow accidents can happen)** **Video demo of belt joints (cold patching, hot vulcanizing & mechanical fastening.)** **Basic of screens & feeders (operation & maintenance)** **V-belt adjustment & tension checking.**	a. Concept of Self-combustion b. Operation of Fire Pump i) Technical data ii) Types of Pumps & Fire Extinguishers iii) Parts of Pump attachments iv) Loading of Centrifugal Pump c. Introduction to fire fighting network i) Technical data ii) Types fittings in fire fighting network. iii) Safety to man, machines and importance of fire fighting system. iv) Fire Extinguisher Operation & Valve operation. v) Log book entry
13	**Revision & Internal Assessment**	

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	
	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 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)
DURATION: 12 MONTHS

GENERAL INFORMATION

1) **Name of the Trade** : **OPERATOR COAL HANDLING EQUIPMENTS**

2) **Batch size** : a) Apprentice selection as per Apprenticeship guidelines.
b) Maximum 20 candidates in a group.

3) **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.

4) **Instructor Qualification** :

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

OR

ii) NTC/NAC in the trade of **Operator Coal Handling Equipments** with three year post qualification experience in the relevant field.

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

5) **Infrastructure for On-Job Training** : - As per Annexure – II

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

A. BLOCK – I
DURATION: 12 MONTHS

1. Safety and best practices/Basic Industrial Culture (5S, KAIZEN, etc.)
2. Prepare different types of documentation as per industrial need by different methods of recording information.
3. **Unloading of Coal Wagons by Tippler** :Familiarization with different parts of Wagon tippler, dos and don'ts, Pre-start checks, shift take over, feed belt / conveyor operation, chute cleaning, post job checks, housekeeping, adherence to Standard Operating Procedures (SOPs)
4. Familiarization with different parts of Wagon Chargers, dos and don'ts, Pre-start checks, shift take over, operation of wagon charger & feed belts, post job checks, housekeeping.
5. Stopping & starting of drives, check points, Emergency stoppage, and power failure.
6. Identification & utility of limit switches of Tipplers, Side Arm Chargers, Beetles, Chute Jam Sensors, pull chords.
7. **Stacking and averaging of Coal by Stacker Operation:** Familiarization with different parts of Stackers, dos and don'ts, Pre-start checks, shift take over.
8. Post job checks, Control Desk Operation, chute cleaning, housekeeping, adhere to SOP.
9. Stopping & starting of drives, check points, Emergency stoppage, and power failure.
10. Stacker operation in monsoon.
11. Identification & utility of limit and safety switches of stackers and conveyors, inspection of trolley wire, Power Collectors, reeling drums & belt joints.
12. **Retrieving of stacked coal by Reclaimer:** Familiarization with different parts of Re-claimers, dos and don'ts, Pre-start checks, shift take over.
13. Post job checks, Control Desk Operation, housekeeping, adhere to SOP.
14. Stopping & starting of drives, check points, Emergency stoppage, and power failure and spillage control.
15. Reclaimer operation in monsoon.
16. Identification & utility of limit and safety switches of Reclaimer and conveyors, inspection of trolley wire, Power Collectors, reeling drums & belt joints.
17. **Crushing of Coal by Selective Crushing Unit Operation:** Familiarization with different parts of Hammer Crusher, dos and don'ts, Pre-start checks, shift take over, feed conveyor operation, chute cleaning, post job checks, housekeeping, adherence to SOP, adjustment of Grate Bar assembly & Breaker plate of crusher.
18. Familiarization with different parts of Pneumatic Classifiers, Weigh Feeders, Dos and Don'ts, Pre-start Checks, shift take over, sequential starts of equipments, post job checks, housekeeping. Eye estimation of coal crushing. Water addition to coal blend.
19. Stopping & Starting of drives, Emergency stoppage and power failure.
20. Identification & utility of limit switches.
21. **Operation of Conveyors:** Shift take-over
22. Pre-start checks
    i. Running checks : Feed adjustments
    ii. Tracking of conveyors

iii. Spillage prevention

23. Shutdown preparations
24. Equipment safety & daily check list
25. Stoppage on emergency / power failure
26. House-keeping
27. **Fire fighting system & pump operation:** Familiarization with different parts of Centrifugal Pump , Dos and Don'ts, Pre-Start Checks, Post Job checks.
28. Familiarization with different types of Fire Extinguishers & parts of fire fighting network, Dos and Don'ts, Mock Drills.

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:

- demonstration of good operational skills while executing the assigned job.
- different accuracy achieved while undertaking different skills demanded by the job.
- a fairly good level of neatness and consistency in handling controls.
- occasional support in completing the project/job.

b) Weightage in the range of above75%- 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 operation while executing the assigned job.
- the majority of the accuracy achieved while undertaking different skills demanded by the job.
- a good level of neatness and consistency in handling controls.
- little support in completing the job.

c) 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 operation while executing the assigned job.
- accuracy while undertaking different work being substantially in line with those demanded by the 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 FOR APPRENTICE

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.

8. FURTHER LEARNING PATHWAYS

Employment opportunities:

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

1. Manufacturing & Process industries like steel plant and other related industries etc.

ANNEXURE – I

TOOLS & EQUIPMENT FOR BASIC TRAINING

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

TRADE: OPERATOR COAL HANDLING EQUIPMENTS

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

As per training need the tools & equipment may be procured.

INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING DRAWING

TRADE: OPERATOR COAL HANDLING EQUIPMENTS

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 Nos.
2.	Set square celluloid 45^0 (250 X 1.5 mm)	20 Nos.
3.	Set square celluloid 30^0-60^0 (250 X 1.5 mm)	20 Nos.
4.	Mini drafter	20 Nos.
5.	Drawing board (700mm x500 mm) IS: 1444	20 Nos.

B : FURNITURE REQUIRED

Sl. No.	Name of the items	Quantity (indicative)
1	Drawing Board	20 Nos.
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

INFRASTRUCTURE FOR ON-JOB TRAINING

TRADE: OPERATOR COAL HANDLING EQUIPMENTS

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. 12 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.