

SIRDAR (COLLIERY)

COMPETENCY BASED CURRICULUM

(Duration: 2 Yrs.)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL- 5



SECTOR – MINING



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



SIRDAR (COLLIERY)

(Revised in 2018)

APPRENTICESHIP TRAINING SCHEME (ATS)



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Developed By

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1. Tata Steel, Jamshedpur
2. Tata Steel, Jharia

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1.1 Apprenticeship Training Scheme under Apprentice Act 1961

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

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

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

1.2 Changes in Industrial Scenario

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

1.3 Reformation

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

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



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2.1 GENERAL

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

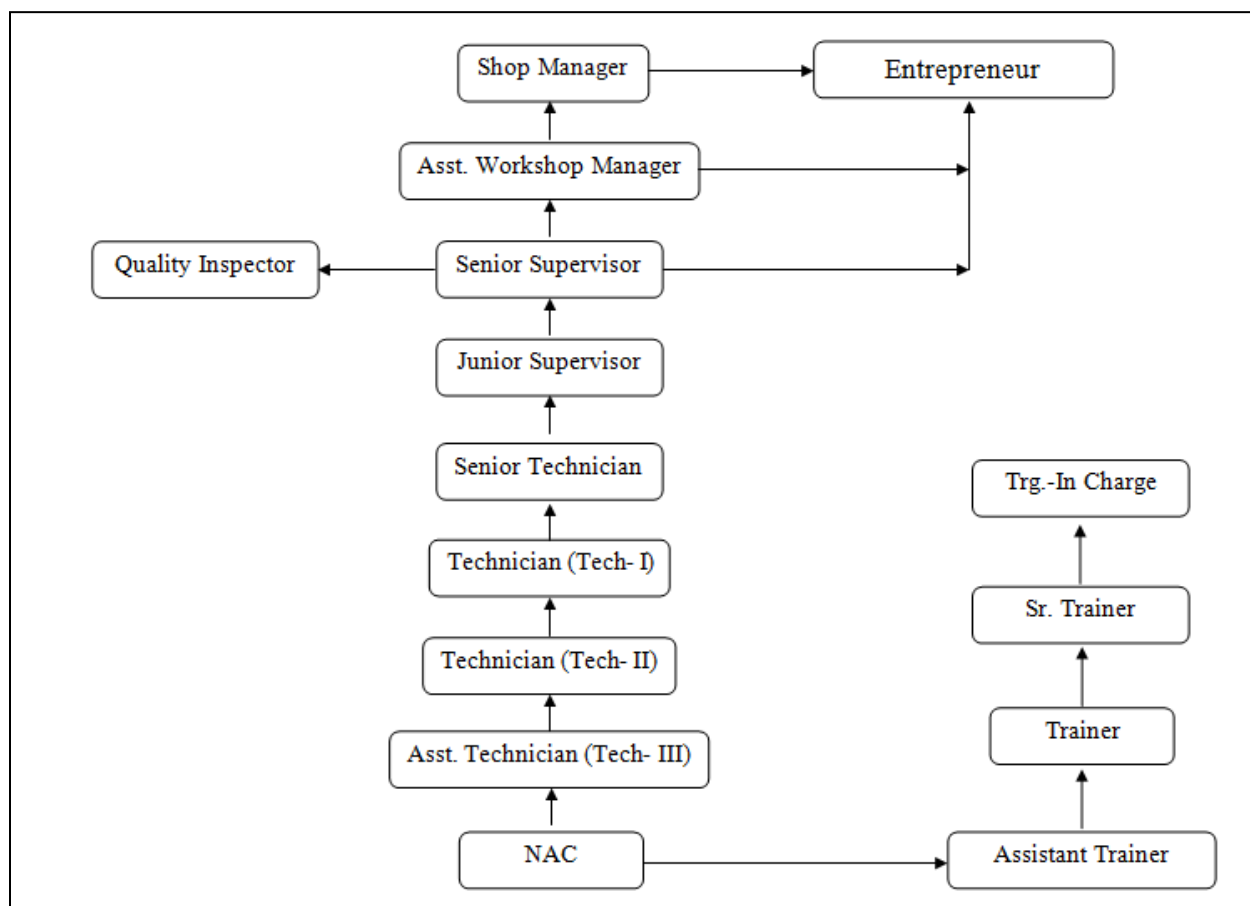
Sirdar (Colliery) trade under ATS is one of the most popular courses delivered nationwide through different industries. The course is of two years (02 Blocks) duration. It mainly consists of Domain area and Core area. In the Domain area Trade Theory & Practical impart professional - skills and knowledge,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

Broadly candidates need to demonstrate that they are able to:

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

2.2 CAREER PROGRESSION PATHWAYS:

- Indicative pathways for vertical mobility.



2.3 COURSE STRUCTURE:

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

Total training duration details: -

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

A. Basic Training

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

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

Sl. No.	Course Element	Total Notional Training Hours	
		For 02 yrs. course	For 01 yr. course
1	Professional Skill (Trade Practical)	550	275
2	Professional Knowledge (Trade Theory)	240	120
3	Workshop Calculation & Science	40	20
4	Engineering Drawing	60	30
5	Employability Skills	110	55
	Total (including Internal Assessment)	1000	500

B. On-Job Training:-

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

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

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

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

C. Total training hours:-

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

2.4 ASSESSMENT & CERTIFICATION:

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

a) The **Internal assessment** during the period of training will be done by **Formative assessment method** by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline (section-2.4.2). The marks of internal assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NAC will be conducted by NCVT on completion of course as per guideline of Govt of India. The pattern and marking structure is being notified by govt of India

from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check individual trainee's profile as detailed in assessment guideline (section-2.4.2) before giving marks for practical examination.**

2.4.1 PASS REGULATION

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

2.4.2 ASSESSMENT GUIDELINE

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

Assessment will be evidence based comprising the following:

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

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

Performance Level	Evidence
(a) Weightage in the range of 60 -75% to be allotted during assessment	
For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment • Below 70% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards.

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	• 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	
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.	• Good skill levels in the use of hand tools, machine tools and workshop equipment • 70-80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A good level of neatness and consistency in the finish • Little support in completing the project/job
(c) Weightage in the range of above 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels in the use of hand tools, machine tools and workshop equipment • Above 80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

Brief description of Job roles:

Sirdar (Colliery) assists Overman, Colliery in his work and supervises drilling, blasting, timbering, etc. Indents and collects material and other equipment near work-site. Directs and guides drilling and blasting operations ensuring observance of safety precautions. Examines edges of space left by extraction of coal seam and directs erection of supports according to SSR (Systematic Support Rule as framed by Manager of the colliery). Attends to dangerous operations giving directions in safety measures. Maintains records of output in his section and submits reports to superiors. He may be deputed (If he has passed Overman Competency certificate from DGMS) as Overman, Colliery in his absence. May render first-aid and conduct rescue operations, if necessary.

Mining Sirdar ensured:

- 1) sides of benches are kept properly dressed;
- 2) stability of benches is not endangered;
- 3) haul roads are kept maintained;
- 4) stability of overburden dumps is not endangered; and
- 5) dust control measures are implemented.

Reference NCO-2015: 121.0500 - Sirdar, Colliery

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4. NSQF LEVEL COMPLIANCE

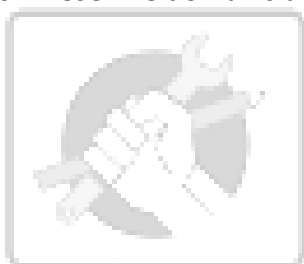
NSQF level for SIRDAR (COLLIERY) trade under ATS: **Level 5**

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

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

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

- a. Process
- b. professional knowledge,
- c. professional skill,
- d. core skill and
- e. Responsibility.



The Broad Learning outcome of SIRDAR (COLLIERY) trade under ATS mostly matches with the Level descriptor at Level- 5.

The NSQF level-5 descriptor is given below:

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

5. GENERAL INFORMATION

Name of the Trade	SIRDAR (COLLIERY)
NCO – 2015	3121.0500
NSQF Level	Level – 5
Duration of Apprenticeship Training (Basic Training + On-Job Training)	Two years (02 Blocks each of one year duration).
Duration of Basic Training	a) Block –I : 3 months b) Block – II : 3 months Total duration of Basic Training: 6 months
Duration of On-Job Training	a) Block–I: 9 months b) Block–II : 9 months Total duration of Practical Training: 18 months
Entry Qualification	Passed 10 th Class with Science and Mathematics under 10+2 system of Education or its equivalent
Selection of Apprentices	The apprentices will be selected as per Apprenticeship Act amended time to time.
Instructors Qualification for Basic Training	As per ITI instructors qualifications as amended time to time for the specific trade.
Infrastructure for basic training	As per related trade of ITI
Examination	The internal examination/ assessment will be held on completion of each block. Final examination for all subjects will be held at the end of course and same will be conducted by NCVT.
Rebate to Ex-ITI Trainees	1 year
CTS trades eligible for Sirdar (Colliery) Apprenticeship	Stone Mining Machine Operator Mechanic Mining Machinery

Note:

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

6. LEARNING OUTCOME

6.1 GENERIC LEARNING OUTCOME

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

Block I & II:-

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Understand and explain different mathematical calculation & science in the field of study including basic electrical. *[Different mathematical calculation & science –Units, Fraction, Work, Power & Energy, Algebra, Geometry & Mensuration, Ratio & Proportion, Heat & Temperature, Mass, weight & Density, Average, Percentage, Forces, Speed and Velocity, Laws of motion, Atmospheric Pressure, Basic electricity, Elements of chemistry]*
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning Method of representation, Symbol, scales, Different Projections, , Assembly drawing, Sectional views, mine sketching]*
4. Select and ascertain measuring instrument and measure dimension of components and record data
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
8. Plan and organize the work related to the occupation.

6.2 SPECIFIC LEARNING OUTCOME

Block – I

1. Safety and best practices (5S, KAIZEN etc.)
2. Study & observe duties and responsibility of mining Sirdar (colliery) as per coal mines regulation-1957 (regulation 44)
3. Study of miners outfit (Personal Protective Equipment's) and identification of rocks and geological formations and disturbances.
4. Basic Carpentry and Joinery applicable to mining supports.
5. Identification of different types of timbers for use in mines.

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6. Transport and stacking of timber in mines.
7. Measuring timber for use in mine workings.
8. Preparing places for erection of support and accessories i.e. lids, wedges etc.
9. Preparing timbers for erection and use of chocks/cogs.
10. Examining work places and roof & sides of working including sites for erection of supports in various situations.

Block – II

11. Erecting props at different inclination.
12. Examining supports for tightness, correctness etc. Testing of roof bolt/resin Capsule, Monitoring of Strata Instrumentation (Convergence recorder, Tale Tell etc.)
13. Preparing timber for cross bar.
14. Preparing sites for fixing and Lagging X-bar
15. Fixing different types of supports in galleries and working in varying conditions.
16. Erecting systematic supports. (Roof/Side bolt, wire netting)
17. Withdrawal of supports under varying conditions.
18. Withdrawal of systematic supports from extraction/depillaring area.
19. Setting of rigid steel supports i.e. props, bars, girders, etc.
20. Setting of yielding steel supports friction type and hydraulically operated.
21. Use of link-bar with steel supports. Study of SSR/Support Plan/Standing order & Code of Practices.
22. Study of flame safety lamp and of other, electrical lights.
23. Use of flame safety lamp in testing 'Gas' and of other testing instruments including concept of LMD (Local Methane Indicator) & Tele-Monitoring System.
24. Testing of Mine gases using flame safety lamp and other testing instruments.
25. Arranging course ventilation by use of brattices. Using auxiliary Fan (Type, capacity etc.)
26. Identification of different types of explosives.
27. Transporting and storing explosives from magazine to work places.
28. Study and assembly of drilling equipment (Electrical/Pneumatic/Universal Drill M/c and Jack Hammer drill M/c.) and various accessories, e.g drill rods, bits etc.
29. Drilling of short holes for undercut/side cut or overcut faces.
30. Use of hole directors and templates, etc.
31. Drilling in sinking and stone drifts with pneumatic drills. (Jack Hammer drill M/c.)

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

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

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

electrical and apply in day to day work. <i>[Different mathematical calculation & science –Units, Fraction, Work, Power & Energy, Algebra, Geometry & Mensuration, Ratio & Proportion, Heat & Temperature, Mass, weight & Density, Average, Percentage, Forces, Speed and Velocity, Laws of motion, Atmospheric Pressure, Basic electricity, Elements of chemistry]</i>	Percentage, Forces, Speed and Velocity, Laws of motion, Atmospheric Pressure, Basic electricity, Elements of chemistry.
	2.2 Measure dimensions as per drawing
	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply given tolerance.
	2.5 Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	2.6 Ensure dimensional accuracy of assembly by using different instruments/gauges.
	2.7 Explain basic electricity, insulation & earthing.
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. <i>[Different engineering drawing-Geometrical construction, Dimensioning Method of representation, Symbol, scales, Different Projections, Assembly drawing, Sectional views, mine sketching]</i>	3. 1. Read & interpret the information on drawings and apply in executing practical work.
	3. 2. Read & analyse the specification to ascertain the material requirement, tools, and machining /assembly /maintenance parameters.
	3. 3. Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
4. Select and ascertain measuring instrument and measure dimension of components and record data.	4.1 Select appropriate measuring instruments such as measuring scales, tapes, plumb-bobs, spirits, level, Hygrometer , Centigrade thermometers, Anemometers (as per tool list).
	4.2 Ascertain the functionality & correctness of the instrument.
	4.3 Measure dimension of the components & record data to analyse them with given drawing/measurement.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	5.1 Explain the concept of productivity and quality tools and apply during execution of job.
	5.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	5.3 Knows benefits guaranteed under various acts

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6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.
	6.2 Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	7. 1. Explain personnel finance and entrepreneurship.
	7. 2. Explain role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.
	7. 3. Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and organize the work related to the occupation.	8. 1. Use documents, drawings and recognize hazards in the work site.
	8. 2. Plan workplace/ assembly location with due consideration to operational stipulation
	8. 3. Communicate effectively with others and plan project tasks
	8. 4. Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.
SPECIFIC OUTCOME	
Block-I& II (Section:10)	
<i>Assessment Criteria i.e. the standard of performance, for each specific learning outcome mentioned under block – I & block – II (section: 10) must ensure that the trainee achieves well developed skill with clear choice of procedure in familiar context. Assessment criteria should broadly cover the aspect of Planning (Identify, ascertain, estimate etc.); Execution (perform, illustration, demonstration etc. by applying 1) a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information 2) Knowledge of facts, principles, processes, and general concepts, in a field of work or study 3)Desired Mathematical Skills and some skill of collecting and organizing information, communication) and Checking/ Testing to ensure functionality during the assessment of each outcome. The assessments parameters must also ascertain that the candidate is responsible for own work and learning and some responsibility for other's work and learning.</i>	

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

Week No.	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1	Importance of trade training, List of tools & Machinery used in the trade. Health & Safety: Introduction to safety equipments and their uses. Introduction of first aid, operation of Electrical mains. Occupational Safety & Health Importance of housekeeping & good shop floor practices. Basic safety introduction, Personal protective Equipments(PPE):- Use of Fire extinguishers.	Importance of safety and general precautions observed in the in the industry/shop floor. All necessary guidance to be provided to the new comers to become familiar with the working of Industrial Training Institute system including stores procedures. 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	Study of mine's outfit and that of SIRDAR (COLLIERY). Identification of samples of different kind of rocks	Coals and it formation. A General associated strata.
3	Identification of geological formations and disturbances e.g. sedimentary, igneous metamorphosis.	Types of explosives used in underground and open cast mines excluding heavy blasting.
4	Basic carpentry and joinery applicable to mining supports.	Mine gases: Decurrence, danger and precautions
5	Identification of different type of timbers for use in mines.	Ventilation –standard of ventilations face, district & mine (2 sessions).
6	Transport and stocking of timber in mines.	Transport systems for winning face to surface (2 Session)
7	Measuring timber for use in mine working.	Coal dust, its hazards and precautions.
8	Preparing places for erection of support.	To take practical training in the mine for: a) Gas Testing b) First Aid c) Shot Firing d) Timbering e) Depillaring (2 session)
9	Preparing accessories i.e. lids, wedge etc for erection of support.	Various types of rocks associated with coal scans. Their characteristics and

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		effect in mining coal.
10	Preparing timbers for use of chocks/cogs.	Institute and drift theory of coal formation. Explain weathering and its effect on roof condition in mining quality of coal deposits and associated rocks.
11-12	Preparing places for erection of chocks/cogs. Examining work places and roof 7 sides of working including for erection of supports in various situations.	Various methods of entry to a coal, scan, shaft drift, incline. Give specific example to explain the choice of method of entry.
13	Internal Assessment/Examination 03days	

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



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BASIC TRAINING (Block – II)

Duration: (03) Three Months

Week No.	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1	Erection chocks and cogs. Erection props at different inclinations.	Explain present of various mine gases, their-properties, physiological effects on human beings (3 sessions). Dine a explain various degrees of gassiness of mine, use of auxiliary fans in mines to be explained.
2	Examining support for tightness, correctness etc.	General precaution in gassy mines, inspection of un-used working for gas. Use of safety lamps in mines. Prohibition of use of contraband in mines, duties of body-checker (2 sessions).
3	Preparing timber for cross X-bar. Preparing sites for fixing X-bar. Lagging X-bars fixed. Fixing cross bar.	Layering of gas, accumulation of gas in cavities Blowers and out bursts of gas. Coal dust explosion, their causes and measures to control the same. Dust suppression, S.D. Gassiness, sampling etc. Precaution against surface fires and underground fires (CMR and Additional, if any). Equipment of fire fighting and their maintenance ((CMR and Additional, if any).
4	Fixing different types of supports in galleries and working varying conditions.	Precaution when fire exists in their mine (CMR and Additional, if any).
5	Erecting systemic support. Withdrawal of support under varying conditions. Withdrawal of support under from extraction/depillaring area.	Execution of dust control measures. Standard ventilation in mine as per CMR. Air measurement in mines, districts, calculation of required quantity of air in a particular district, air quantity based on employment of person, production of blasting fumes. Describe briefly (3session). a) Anemometer, and Velometer. Ventilation of mines by mechanical ventilators and natural ventilation. Explain limitation of natural ventilation.
6	Setting of rigid steel support i.e. props, bars, girders etc.	Requirement of first aid under mines rules & necessary thereof.
7	Setting of yielding steel support friction type.	Rules of first aid, In case of accident what to do for first-aid. Duties of injured and other-

Sirdar (Colliery)

	Setting of yielding steel supports hydraulically operate.	persons including officials after receiving information of an injury to a person. Types of explosive – Low high permitted, non-permitted, use of explosive in the underground and opencast mines.
8	Use of link-bars with steel supports. Study of flame safety lamp and other electrical lights.	Requirement of CMR 1957 regarding transport explosives including bulk transport. Explosives reserve station in mines. Approved shot firing apparatus, additional precautions in gassy mines while using explosives under MCR 1957 shot firing cable approved under circular issued by DGMS.
9	Use of flame safety lamp in testing 'Gas' and of other testing instruments.	Precautions after firing, misfires, special precautions in stone drifts.
10	Testing of Mine using flame safety lamp and other instrument in use.	Various method of coal transport from the wining face to the surface.
11	Arranging coarse ventilation by use of brattices, sheets etc.	Different voltage used in mines, concept of transformer and motor.
12	Use of self rescuer.	Introduction to intrinsically safe circuits and flame proof apparatus use in mines. Various sources of water in mines, table, water bearing strata, etc.
13	Internal Assessment/Examination 03days	

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

9. SYLLABUS - CORE SKILLS

9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

Block – I		
Sl. No.	Workshop Calculation and Science (Duration: - 20 hrs.)	Engineering Drawing (Duration: - 30 hrs.)
1.	Unit: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units	Engineering Drawing: Introduction and its importance - Viewing of engineering drawing sheets. - Method of Folding of printed Drawing Sheet as per BIS SP:46-2003
2.	Fractions: Fractions, Decimal fraction, Addition, Subtraction, Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems using Calculator.	Drawing Instruments : their 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.
3.		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
4.	Average: Problems of Average. Ratio & Proportion: Simple calculation on related problems.	Drawing of Geometrical Figures: Drawing practice on: - Angle: Measurement and its types, method of bisecting. - Triangle -different types - Rectangle, Square, Rhombus, Parallelogram. - Circle and its elements.
5.	Mass, Weight and Density: Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density and specific gravity.	Dimensioning: - Definition, types and methods of dimensioning (functional, non-functional and auxiliary) - Types of arrowhead - Leader Line with text

6.		<u>Free hand drawing of</u> - Lines, polygons, ellipse, etc. - geometrical figures and blocks with dimension - Transferring measurement from the given object to the free hand sketches.
7.	<u>Percentage:</u> Introduction, Simple calculation. Changing percentage to decimal and fraction and vice-versa.	<u>Method of presentation of Engineering Drawing</u> - Pictorial View - Orthogonal View - Isometric view
8.	- Forces definition. - Definition and example of compressive, tensile, shear forces, axial and tangential forces. Stress, strain, ultimate strength, factor of safety for MS. <u>Speed and Velocity:</u> Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation.	<u>Symbolic Representation (as per BIS SP:46-2003) of :</u> - Fastener (Rivets, Bolts and Nuts) - Bars and profile sections - Weld, brazed and soldered joints. - Electrical and electronics element - Piping joints and fittings
9.	<u>Mensuration:</u> Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle. Volume of solids – cube, cuboids, cylinder and Sphere. Surface area of solids – cube, cuboids, cylinder and Sphere. - Area of cut-out regular surfaces: circle and segment and sector of circle. - Volume of cut-out solids: hollow cylinders, frustum of cone, block section. - Volume of simple solid blocks.	<u>Dimensioning practice:</u> - Position of dimensioning (unidirectional, aligned, oblique as per BIS SP:46-2003) - Symbols preceding the value of dimension and dimensional tolerance.
10.	<u>Algebra:</u> Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables). - Circular Motion: Relation between circular motion and Linear motion, Centrifugal force, Centripetal force.	<u>Construction of Geometrical Drawing Figures:</u> - Polygons and their values of included angles. Conic Sections (Ellipse)
11.	<u>Work, Power and Energy:</u> - Work, unit of work, power, unit of	<u>Projections:</u> - Concept of axes plane and quadrant.

	power, Horse power, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy. - Function of leaver, pulley.	- Orthographic projections - Method of first angle and third angle projections (definition and difference) - Symbol of 1st angle and 3rd angle projection as per IS specification. Drawing of Orthographic projection from isometric/3D view of blocks
Block – II		
Sl. No.	Workshop Calculation and Science (Duration: - 20 hrs.)	Engineering Drawing (Duration: - 30 hrs.)
1.	Law of motions and calculations related trade, atmospheric pressure, its measurement etc.	Mine sketching: Preparing sketch plans of work place involving different kinds of supports, position of equipment, workmen, extraction of stook, stowing faces.
2.	Heat & Temperature: Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, scale of temperature, relation between different scale of temperature, Thermometer, pyrometer, transmission of heat, conduction, convection, radiation.	Drawing: - Cattles safety tools, crossing, guide shoes, doors, air crossing etc.
3.	Basic Electricity: Introduction, use of electricity, Types of current_ AC, DC, their comparison, voltage, resistance, their units. Conductor, insulator, Types of connections – series, parallel, electric power, Horse power, energy, unit of electrical energy. Concept of earthing.	- Reading & interpretation of assembly drawing and detailing.
4.	Elements of chemistry: - Element and compound, atoms and molecules. - Chemical reaction and combination chemical formulas related to mine gases.	- Reading of drawing. Simple exercises related to missing lines, dimensions and views. How to make queries.
5.		- Simple exercises related to trade related symbols. - Solution of NCVT test papers.

9.2 EMPLOYABILITY SKILLS**(DURATION: - 110 HRS.)**

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

and Internet	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.	
3. Communication Skills		Duration : 15 Hrs. Marks : 07
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.	
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.	
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.	
Facing Interviews	Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview.	
Behavioral Skills	Problem Solving Confidence Building Attitude	
Block – II Duration – 55 hrs.		
4. Entrepreneurship Skills		Duration : 15 Hrs. Marks : 06
Concept of	Entrepreneur - Entrepreneurship - Enterprises:-Conceptual issue	

Entrepreneurship	Entrepreneurship vs. management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.
Project Preparation & Marketing analysis	Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.
Institutions Support	Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.
5. Productivity	
Duration : 10 Hrs. Marks : 05	
Benefits	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard.
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation - How improves or slows down.
Comparison with developed countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.
6. Occupational Safety, Health and Environment Education	
Duration : 15 Hrs. Marks : 06	
Safety & Health	Introduction to Occupational Safety and Health importance of safety and health at workplace.
Occupational Hazards	Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.
Accident & safety	Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.

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

10. DETAILS OF COMPETENCIES (ON-JOB TRAINING)

BROAD LEARNING TO BE COVERED IN INDUSTRY FOR SIRDAR (COLLIERY) TRADE:

1. Safety and best practices /Basic Industrial Culture (5S, KAIZEN, etc.)
2. Record keeping and documentation
3. Making components observing different carpentry & Joinery procedure and perform different mining supports job.
4. Assembling of different components as per requirement and check functionality.
5. Carryout maintenance of different machines including hydraulics & pneumatics system.

Note: Actual training will depend on the existing facilities available in the establishments.

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

Block – I

1. Safety and best practices (5S, KAIZEN etc.)
2. Record keeping and documentation
3. Repair & Maintenance work
4. Study & observe duties and responsibility of mining Sirdar (colliery) as per coal mines regulation-1957 (regulation 44) Examination by mining Sirdar (colliery) (regulation 113) and also follow regulation No person shall be appointed as a competent person under regulations 113, 114, 117(6), 124, 127(6), 141(1) and 142 unless he is the holder of either a Manager's or Over man's Certificate or a SIRDAR's Certificate together with a gas testing certificate:
5. Study of miners outfit (Personal Protective Equipment's) and that of SIRDAR (COLLIERY)
6. General layout of the mine survey office, equipment's and organization, Study of Mine plans and its type to be maintained and kept as per regulation, method of plotting and storage, Surveys for determination of coal stock, shaft survey, survey for drifts and roadways, prolonging the centre line of the roadways, Grade line etc. Routine measurements for payment of weekly advance of drives, development work, construction etc.
7. Identification of samples of different kind of rocks
8. Identification of geometrical formations and disturbances i.e. sedimentary igneous metamorphic Barakar, Ranigunj, Talchur, Tartiny and Folds Faults, Washout Dykes, Cleats, Cleavages, Bidding planes, slips etc.
9. Basic Carpentry and Joinery applicable to mining supports.
10. Identification of different types of timbers for use in mines.
11. Transport and stacking of timber in mines.

12. Measuring timber for use in mine workings.
13. Preparing places for erection of support.
14. Preparing accessories i.e. lids, wedges etc for erection of support.
15. Preparing timbers for use chocks/cogs.
16. Preparing places for erection of chocks/cogs.
17. Examining work places and roof & sides of working including sites for erection of supports in various situations.
18. Erection chocks and cogs.
19. Erecting props at different inclination.
20. Examining supports for tightness, correctness etc. Testing of roof bolt/resin Capsule, Monitoring of Strata Instrumentation (Convergence recorder, Tale Tell etc.)
21. Preparing timber for cross bar.
22. Preparing sites for fixing X-bar
23. Fixing X-bar Fixed.
24. Lagging X-Bars Fixed.
25. Fixing different types of supports in galleries and working in varying conditions.
26. Erecting systematic supports. (Roof/Side bolt, wire netting)
27. Withdrawal of supports under varying conditions.
28. Withdrawal of systematic supports from extraction/depillaring area.
29. Setting of rigid steel supports i.e. props, bars, girders, etc.
30. Setting of yielding steel supports friction type.
31. Setting of yielding steel supports hydraulically operated.
32. Use of link-bar with steel supports. Study of SSR/Support Plan/Standing order & Code of Practices
33. Study of flame safety lamp and of other, electrical lights.
34. Use of flame safety lamp in testing 'Gas' and of other testing instruments including concept of LMD (Local Methane Indicator) & Tele-Monitoring System.
35. Testing of Mine gases using flame safety lamp and other testing instruments.
36. Arranging and coursing ventilation by use of brattices. Using auxiliary Fan (Type, capacity etc.)
37. Type of ventilation practiced, If fan used whether used as forced or exhaust fan, Type of fan – its diameter and width, Quantity of air per minute and water gauge, General system of underground ventilation, Arrangements for coursing and regulating the air underground, Study of air crossings, ventilation stoppings, regulators, doors etc. Ventilation survey and records pertaining the same, Ventilation plan, Air velocity, Construction and maintenance of fire stopping.
38. Use of self rescuer. Oxygen Reviving apparatus etc., breathing apparatus etc.
39. Identification of different types of explosives.
40. Transporting explosives from magazine to work places.

Sirdar (Colliery)

41. Storing explosives temporarily underground (if any) –Reserve Station
42. Preparing charge with different kinds of explosives. Awareness of PESO system. Study of permission of Solid Blasting by DGMS.
43. Study and assembly of drilling equipment (Electrical/Pneumatic/Universal Drill M/c and Jack Hammer drill M/c.) and various accessories, e.g drill rods, bits etc.
44. Drilling of short holes for undercut/side cut or overcut faces.
45. Use of hole directors and templates, etc.
46. Drilling in sinking and stone drifts with pneumatic drills. (Jack Hammer drill M/c.)

Block – II

47. Safety and best practices (5S, KAIZEN etc.)
48. Store procedure, Record keeping, inventory management and documentation
49. Repair & Maintenance work
50. Drilling in coal heading dips and inclines in different situation.
51. Examination shot hole
52. Use of shot firing tools e.g. crimpers, knife, pricker, crack detector, steaming rods, circuit tester, Exploder (25 Shot or 100 Shot)
53. Steaming and charging of shot holes. Stemming materials used in Mines
54. Firing of shot holes e.g. single shot, multiple shots, in rounds, multiple shots with delay – detonators.
55. Dealing with blown out shots, miss- fires.
56. Cautioning before firing and taking shelter.
57. Examining gases before and after firing and making the place safe after firing.
58. Firing shots in sinking, drifting and headings.
59. Examining work places before and after shot firing.
60. Study of mine layouts in quarry, incline and shaft mine
61. Development of men in quarry, incline and shaft mine for desired output in different operations. Face OMS, District OMS, U/G OMS and overall OMS of the mine
62. Study of systems of loading M/c SDL/LHD/CM and transport in mines (Haulage/Hoist/Chain Conveyor/Belt Conveyor).
63. Study of systems of storage of materials &Handling of Materials (Use of Sling/Chain Block pulley/Pushing & Pulling M/c. etc.)
64. Installation and operation of signalling (Bell)/communication systems (Telephone etc).
65. Operation of emergency signaling/communicating system
66. Study and practice of summoning help in distress in emergencies.
67. Study of drainage layouts.
68. Preparation of sumps/Dam

Sirdar (Colliery)

69. Installation and operating of different types of pumps e.g. centrifugal, turbines, reciprocation, face pumps etc.
70. Identification of common faults in pumps and simple trouble shooting.
71. Extending working to approach water logged working.
72. Operating coal mining machinery e.g. haulages, coal cutting machines (Road headers/CM etc.), conveyors, locos, winches, etc.
73. Identification of various sizes of rails and accessories.
74. Laying track:
 - A. Straight
 - B. Curves
 - C. Crossing
 - D. Branches etc.
75. Study of safety features of Type of winder and its choice, Suspension gears and its part, Cage or skip and its type, safety devices, capacity of cages, Keps, gates and other safety fittings, Winding engine room and its location, over speed preventer, over winding and slow banking device, speeds control of the winders, depth indicator.
76. INUNDATION & FIRE OF MINE WORKING : Precaution while approaching water logged workings, Standing order during inundation, Precautions when a fire has broken out, methods of dealing with fire, Isolation stopping & fittings in it, Inspection of IS, Precautions while reopening a sealed off area, Fire fighting arrangement (fire extinguisher) Standing order, Monitoring of environment behind Isolation Stopping's etc.
77. Stowing arrangement layout, method adopted, choice of the method, Stowing material, stowing range, mixing chamber, water reservoir, Hydraulic profile and gradient, sand water ratio, stowing rate, stowing efficiency. Source of sand, Alternative of sand & their quality, Advantage of stowing, Preparation of barricade etc.

Note:

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

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

SIRDAR (COLLIERY)			
LIST OF TOOLS AND EQUIPMENT for Basic Training (For 20 Apprentices)			
A. TRAINEES TOOL KIT			
Sl. no.	Name of the Tool & Equipments	Specification	Quantity
1	Simple geological model – folds, faults etc.		As required
2	Sample of rocks – different types (specimen)		As required
3	Sample of universals – different type		As required
4	Strike plate		As required
5	Lens		As required
6	Hammers (Geological)		As required
7	Clinometers		As required
8	Hygrometer		As required
9	Centigrade thermometers		As required
10	Anemometers		As required
11	Mines outfits and that of SIRDAR (COLLIERY)/mate, blaster/shotfirer		As required
12	Carpentry, tools and equipment		As required
13	Measuring scales, tapes, plumb-bobs, spirits, level etc.		As required
14	Prop-with drawer, buntions, sticks for testing.		As required
15	Hammer, crowbar, chisel bar etc.		As required
16	Chalk, strings etc		As required
17	Spanner and tools necessary for rigid supports.		As required
18	Self rescuer		As required
19.	Samples of explosives, detonators and fuses etc.		As required
20.	Drilling apparatus and equipment including supply and control panel.		As required
21.	Holes directors, templates		As required
22.	Pneumatic drills and accessories		As required
23.	Flame safety lamps, magnetic unlocker, electric lamps, fitting and accessories		As required
24.	Gas testing instruments and equipment		As required
25.	Methanometers – different types		As required
26.	Signalling and communicating system		As required
27.	Different types of machines and equipments use		As required

Sirdar (Colliery)

28.	Different type of pumps		As required
29.	Co-detector/multi-gas detectors, cage with birds		As required
30.	Pilots tube, prismatic compass, mining dial, drawing instruments, dumpy level etc.		As required
31.	Different type of fans		As required
32.	Different type of rope haulages/loaders		As required
33.	Model of different type of conveyors including drivers and discharge arrangements		As required
34.	Haulage roadway with all safety devices		As required
35.	Different type of safety hook/shaft fitting and equipment		As required
36.	Simulated mine working faces with ventilation circuit method of working, support and transport system etc.		As required
37.	Model of sinking shaft showing all the details		As required
SHOT FIRING TOOLS			
38.	Stemming rods		As required
39.	Container for explosives and for detonators		As required
40.	Blank cartridges		As required
41.	Knife		As required
42.	Crimper		As required
43.	Crack detector-cum-scraper		As required
44.	Model of work faces showing pattern of holes, position of cut order blasting		As required

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**INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING
DRAWING**

TRADE: SIRDAR (COLLIERY)

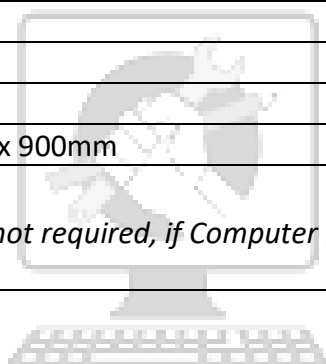
LIST OF TOOLS& EQUIPMENTS FOR -20APPRENTICES

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

2) **Infrastructure:**

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

TOOLS & EQUIPMENTS FOR EMPLOYABILITY SKILLS		
Sl. No.	Name of the Equipment	Quantity
1.	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software	10 Nos.
2.	UPS - 500VA	10 Nos.
3.	Scanner cum Printer	1 No.
4.	Computer Tables	10 Nos.
5.	Computer Chairs	20 Nos.
6.	LCD Projector	1 No.
7.	White Board 1200mm x 900mm	1 No.
<i>Note: - Above Tools & Equipments not required, if Computer LAB is available in the institute.</i>		



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FORMAT FOR INTERNAL ASSESSMENT

Name & Address of the Assessor :						Year of Enrollment :							
Name & Address of ITI (Govt./Pvt.) :						Date of Assessment :							
Name & Address of the Industry :						Assessment location: Industry / ITI							
Trade Name :			Semester:			Duration of the Trade/course:							
Learning Outcome:													
Sl. No	Maximum Marks (Total 100 Marks)	15	5	10	5	10	10	5	10	15	15	Total internal assessment Marks	Result (Y/N)
	Candidate Name	Father's/Mother's Name	Safety consciousness	Workplace hygiene	Attendance/ Punctuality	Ability to follow Manuals/ Written instructions	Application of Knowledge	Skills to handle tools & equipment	Economical use of materials	Speed in doing work	Quality in workmanship	VIVA	
1													
2													