

23. इस योजना सूचना से सम्बन्धित सभी भविष्य के घोषणा जैसे सरोपन पर और रिजल्ट इत्यादि केवल सीसीएल की वेबसाइट [www.centralcoalfields.in](http://www.centralcoalfields.in) पर प्रदर्शित किए जाएंगे सभी अभ्यर्थियों से अनुरोध है कि वे हमारी वेबसाइट पर जाकर चयन प्रक्रिया के प्रत्येक चरण पर अद्यतन करें।

All future announcements in connection with these vacancies including corrigendum (if any) & results would be made only on the website [www.centralcoalfields.in](http://www.centralcoalfields.in). Candidates are advised to visit the website for updates.

#### प्रहलक्षण तिथियाँ

1	ऑनलाइन आवेदन प्रारम्भ होने के तिथि	30.03.2023
2	ऑनलाइन आवेदन के लिए अंतिम तिथि	19.04.2023
3	प्रवेश पर डाउनलोड करने की तिथि	30.04.2023 - 04.05.2023
4	कम्प्यूटर बेस्ड टेस्ट (C B T ) की तिथि	05.05.2023
5	परिणाम घोषणा	29.05.2023

#### IMPORTANT DATES

1	Submission of Online application will commence from	30.03.2023
2	Last date for Online application	19.04.2023
3	Tentative date of downloading Admit Cards	30.04.2023 - 04.05.2023
4	Tentative date of Computer Based Test (CBT)	05.05.2023
5	Tentative date of declaration of results	29.05.2023

  
General Manager(Personnel/Recruitment), Central Coalfields Limited, Ranchi

अनुसूचक/ Annexure A

#### Syllabus for various posts (only illustrative and not exhaustive)

##### Syllabus for the post of Mining Sirdar T&S Grd-C.

1 Coal Mines Regulation, 2017  
Sub regulation & Chapter of Coal Mines Regulation.  
Chapter I Preliminary

Regulation 1 & 2 in totality.  
Regulation No. 12, 13, 14, 15, 16, 17, 18, 19, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36

Chapter V - Duties & responsibilities of mine management, contractors, manufacturers, officials, competent person and workmen in totality.

Chapter VI - Regulation  
64, 65, 66, 67, 71, 72, 73, 74, 75, 78, 79, 80, 81, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 104, 10, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207.

211,212,213,214,215,216,217,221,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,239,240,241,242,244,245,246,247,248,249,2541,252,253,254,255,256.

Schedule as per sub regulation 2(of regulation 64) convention for preparation of plan & action.

Mines Act, 1952

Chapter-I Preliminary

Chapter-III Section 12,13 & 14.

Chapter IV Section16,17 & 18.

Chapter V Section 19,20,22,22A,23,24,25

Chapter VII Hours and limitation of employment in totality.

Chapter VII Leave with wages (Section 49,50,51,52,53,54,55).

Chapter IX Penalty and procedure ( Section Section 63,64,65,66,67,68,69,70,72,73,77)

Mines rescue rules, 1985

Chapter I, Chapter II, Chapter III, Chapter IV, Chapter V, Chapter VI in totality.

Mine rules, 1955 - In totality.

Mine VT rules, 1966 - In totality.

### Syllabus for the post of Dv.Surveyor (Mining), T&S Grd-C

1. Reg.53 of CMR -2017 : Duties and responsibilities of Surveyor ,
2. Reg.64 of CMR -2017 : General requirements about Mine Plans,
3. Reg.65 of CMR-2017 : Type of plans
4. Reg.66 of CMR-2017 : Plans and sections to be submitted after abandonment, closure or discontinuance.
5. Reg.67 of CMR-2017 : Survey instruments and materials.
6. Reg.68 of CMR-2017 : List of plans, sections and instruments and their storage.
7. Reg.69 of CMR-2017 : Preparation of plans by surveyors.
8. Reg.70 of CMR-2017 : Plans to be checked on change of ownership or on reopening, etc.
9. Reg.118 of CMR-2017 : Multi-section and contiguous working -
10. Reg.119 of CMR-2017 : Working under railways and roads, etc.-
11. Reg.121 of CMR-2017 : Working near mine boundaries in belowground mines.
12. Reg.122 of CMR-2017 : Working near mine boundaries in opencast mines.-
13. Reg.149 of CMR-2017 : Danger from surface water.-
14. Reg.150 of CMR-2017 : Danger from underground inundation,-
15. Reg.151 of CMR-2017 : Intentional flooding.-
16. Reg.152 of CMR-2017 : Construction of reservoir, water dam, etc.-
17. Reg.163 of CMR-2017 : Ventilation plans to be brought up-to-date.-
18. Reg.227 of CMR-2017 : Ventilation plan for methane exploration or extraction belowground.
19. Reg.246 of CMR-2017 : Manpower distribution plan.-
20. Reg.251 of CMR-2017 : Place of accident not to be disturbed.
21. Reg.252 of CMR-2017 : Emergency response and evacuation plan.
22. Reg.256 of CMR-2017 : Plans, sections and records -
23. SCHEDULE [See sub-regulation (2) of regulation 64] CONVENTIONS FOR PREPARING PLANS AND SECTIONS.
24. Surveying and Levelling.
25. Use of Modern Surveying Instruments like 3D TLS, ETS, Precise Levels, etc. in OC & UG mines.
26. Use of Survey and Mapping Software.
27. Traverse calculation with distribution of-errors by using modern surveying instruments.
28. Limits of errors as per DGMS.
29. Co-relation Survey.
30. Volumetric measurement & calculation of OB removal, coal extraction and coal stock.

## Syllabus for the post of Assistant Foreman(Electrical) T&S Grd-C

### Electricity Theory (Elementary Knowledge)

**Principles of Electricity** – Electric voltage, Current and resistance, Ohm's law – specific resistance, Laws of resistance and their application for calculating voltage drop, series and parallel circuits, Practical units of voltage, current, resistance, power and energy. Relation between electrical power unit (KW) and Mechanical Power Units (HP).

**Electro Magnetism** – Concept of Electro Magnetic Force (EMF), production of E.M.F., Flemings Right and Left Hand Rules, Magnetic, Chemical and heating effects of electric current. Magnetic properties of material, Electromagnets and their various applications.

**Materials** – Conductors, Semiconductors and insulator materials and their relative merits, Transformer oil, Effect of heat and moisture on insulation. Lubricants and their uses.

Different types of wires, cables, switches, circuit breakers, cutouts, etc.

**Generation of Electricity** – Sources of natural energy. Renewable and Non-Renewable source methods of production of electricity both Alternating Current and Direct Current.

**A.C. Generators (Alternators)** – Essential components and constructional feature, Methods of voltage and frequency control conditions and methods for synchronizing, simple associated switchboard and its accessories.

**D.C. Generators** – Essential components and constructional features, Shunt, series and compound dynamos and their characteristics, causes for sparking, Commutators and their maintenance, Carbon brushes, their adjustment and care. Methods of voltage regulation. Conditions for parallel operation, simple associated switch board and its accessories.

**Batteries** – Primary cells, Dry cells, Lead acid cells, Nickel, Iron or Alkaline cells. Initial and subsequent charging of batteries. Charging circuits and their calculations. Series and parallel circuits Maintenance of batteries. Use of Hydrometers.

**A.C. Motors** – Theory of induction (squirrel cage and slip-ring type) synchronous and commutator motors, their uses, installation, method of starting, speed control and reversal of direction.

**D.C. Motors** – Theory of series, shunt and compound wound type motors, their uses, installation, method of starting, speed control and reversal of direction.

**A.C. Circuits** – Knowledge of vectors. Phase and phase difference. Resistance, inductance and capacitance in an A.C. Circuit. Periodicity or Frequency. Power and power factor. Single phase and three phase systems, star and delta connections. Phase Sequence.

**Controlling and Regulating Gear** – Knowledge of various types of switches, circuit breakers, cutouts, starters, regulators and protective devices for both A.C. and D.C. motors and their wiring with the motors.

**Transformation** – Knowledge of single phase and three phase transformers, their construction, use and maintenance. Phasing out, parallel working, auto transformer, transformer tapplings, temperature rise, instrument transformer.

#### **Transmission and Distribution** –

**Overhead Lines** – Simple calculations and general principles of construction of low, medium and high voltage lines. Size of conductors, length of spans, sag, strength of poles, spacing of conductor, cross arms, effect of temperature, wind pressure, ice and snow, tension on wire. Insulators, brackets, stays, struts, guard wires and other protective devices. Earthing, lightning arrestors, lightning conductors and their testing and fault location.

**Underground Cables** – underground cables, simple calculations and general principles of laying cables direct in ground, in troughs and pipes. Handling, bending, jointing, plumbing. Underground and above ground junction boxes. Distribution board, Joint box compound, melting of compound and filling boxes with compound. Testing and fault location.

**Illumination** – Metal filament lamps, fluorescent lamp circuits, Photometric units and simple measurements. General requirements of efficient lighting and elementary calculations. Street lighting. Time switches.

#### **Generation:**

(a) DC and AC power supply for auxiliaries, arrangement of unit auxiliary and station service boards, station lighting and automatic changeover. Station batteries and charging methods. Standby and emergency power and lighting systems.

(b) Testing & Measurement – Working principle and basis of instrument and measurements. Details of measuring instruments for pressure, flow, temperature, level, alignment and current, voltage, power, reactive power, frequency, energy, winding temperature, auto controllers, recorder, insulation, tester, its use for primary detection of faults, data acquisition system, digital distributed control, UPS etc. Testing of electrical and mechanical equipments.

(c) Control & Protection – Sequential operation & interlocks, general machine start/stop, sequence of operation.

#### **Electricity Utilization for –**

##### **Domestic installation** –

- WIRING - Wiring layout of different types for lighting and power installations in residential premises together with the necessary switchgear, estimate of materials and cost of different types of installations. Wiring of temporary installations and portable appliances.
- CIRCUIT DIAGRAM – Electrical connections of various circuits for (i) House wiring including those for main and sub-distribution boards, switches and cutouts etc.

APPARATUS – Installations and maintenance of heaters, cookers, refrigerators and other domestic appliances. Electric bells and indicators. Small motors for pumps and electric lifts.

ENERGY MEASUREMENT AND CHARGES – Energy meters both D.C. and A.C. for house service.

SIMPLE CALCULATION – Simple calculations relating to cost of energy, elementary knowledge of methods of charging for energy.

TESTING AND FAULT ATTENDANCE – Detection and location of faults in domestic appliances and wiring installations. Insulation and continuity test. Rectification of faults. Tests for insulation resistance to earth. Earth testing.

PROTECTIVE DEVICES – Elementary knowledge of the use of fuses and cutouts, earthing of domestic appliances, motors etc. use of lighting arrestors.

#### **Industrial installation –**

WIRING – Wiring layouts of different types for lighting and power installations in industrial premises together with the necessary switchgear. Estimates of materials and cost of different type of installations. Wiring of temporary installations and portable appliances.

CIRCUIT DIAGRAMS – Electrical connections for – D.C. & A.C. Motors, their starters regulators, Main and sub-distributing boards with circuit breakers, switches, fuse units with load statement for each circuit, D.C. & A.C. Motors, their starters regulators, Battery charging equipments, Converting machinery, Lifts with their safety devices.

PUMP INSTALLATIONS – General principles and elementary calculations of head, power and energy requirements.

APPARATUS – Installation and maintenance of generators, electric motors, electric welding machines, haulage and winding machines, cooling and heating appliances.

POWER AND ENERGY MEASUREMENT AND CHARGES – Measurement of power, Wattmeters, energy meters both D.C. & A.C., power factor correction by capacitors.

SIMPLE CALCULATION – Simple calculations relating to cost of power and energy, elementary knowledge of methods of charging for demand and energy.

TESTING AND FAULT ATTENDANCE – Detection and location of faults in D.C. & A.C. generators, motors, overhead distribution lines and underground cables, electric instruments and apparatus and wiring installations. Rectification of faults, Insulations and continuity tests. Tests for insulations resistance to each earth testing.

PROTECTIVE DEVICES – Elementary knowledge of earthing of generators, motors, machines, installations and appliances. Use of lighting arrestors, fuses including high rupturing capacity fuses, cutouts, circuit breakers, over load and no volt protections, thermal trips, fuses breaking switches and over speed protection.

#### **Overhead Lines**

- Survey, Design, Construction Standards, Foundation Erection, Stringing and Construction equipments.
  - Testing, fault locations, commissioning, maintenance and protections including safety devices and testing equipments.
  - Selection of supports, cross arms, brackets, stays struts insulators and associated hardware.
- Types and size of conductors, length of spans, sag, spacing of conductors, effect of temperature, wind pressure, ice and snow on tension of conductors, lighting on conductor.
- Earthings, lightning arresters, guard wires, relays and other proactive devices.

❖ **Cables**

- Classification of cables, criteria for the selection of power cables, PVC & XLPE underground cables. Classification of tests for cables laying, safe handling of cable drums, cable joints, cable terminations, crimp connections, maintenance of electric cable, flexible cable, flexible cables for portable machines, faults in underground cables system, methods of fault location underground cable system.

❖ **Sub-Stations and Control Room:**

- Layout, design, construction standards of HT transformers and associated equipments (i.e. CBs, Isolators, LAs, Capacitors, CTs, PTs, etc)
- Power and distribution transformers – their erection, commissioning, fault locations, and maintenance.
- Protective relays and measuring equipments and their networking, Transformer protection, Generator, Diesel Generator protection.
- Testing commissioning, fault locations, maintenance and protection of cables and testing equipments.
- Design and installation of capacitor banks and their maintenance.
- Erection, testing, commissioning and maintenance of control room equipments including station batteries and communication system.

❖ **Motors and Generators (DC and AC):**

- Installation, testing, commissioning, protection and control and maintenance of industrial motors.

**Operational knowledge for the following :-**

Operational knowledge on measuring instruments i.e. Ammeters, Voltmeters, Multimeters, Tongue Testers, Meggers, HV testing kits etc.

Illumination, fire fighting and earthing systems including maintenance.

Preparation, representation, interpretation of electrical drawings and execution of electrical work. Flame proof equipment/ intrinsically safe for underground switch board, panels, breakers etc for underground.

**SAFETY RULES – Working Knowledge of –**

- (a) Safety regulation -2010 of CEA (Measures relating to safety and electric supply) All regulations including Regulations for mining installation
- (b) Fire safety procedures, fire protection of generators, transformer and fire fighting and protection
- (c) Protection and restoration of persons suffering from electric shock.

## Syllabus for the post of Electrician (Non-excav) / Technician Cat-IV

### Electricity Theory (Elementary Knowledge)

*Principles of Electricity* – Electric voltage, Current and resistance, Ohm's law – specific resistance, Laws of resistance and their application for calculating voltage drop, series and parallel circuits, Practical units of voltage, current, resistance, power and energy. Relation between electrical power unit (KW) and Mechanical Power Units (HP).

*Electro Magnetism* – Concept of Electro Magnetism and various applications.

*Materials* – Conductors, Semiconductors and insulator materials and their relative merits. Transformer oil, Effect of heat and moisture on insulation, Lubricants and their uses.

Different types of wires, cables, switches, circuit breakers, cutouts, etc,

*Generation of Electricity* – Sources of natural energy. Renewable and Non-Renewable source methods of production of electricity both Alternating Current and Direct Current.

*A.C. Generators (Alternators)* – Essential components and constructional feature

*D.C. Generators* – Essential components and constructional features

*Batteries* – Types, Series and parallel circuits. Maintenance of batteries.

*A.C. Motors* – Elementary idea - construction, installation, method of starting, speed control and reversal of direction.

*D.C. Motors* – Elementary idea - construction, installation, method of starting, speed control and reversal of direction.

*A.C. Circuits* - Single phase and three phase systems. Star and delta connections.

*Controlling and Regulating Gear* – Knowledge of various types of switches, circuit breakers, cutouts, starters, regulators and protective devices for both A.C. and D.C. motors

*Transformation* – Knowledge of transformers, their construction, use and maintenance.

### *Hand Tools & Personal Protective Equipment*

*Earthing Practices*

*Safety Practices*

### ELEMENTARY KNOWLEDGE OF THE FOLLOWING :-

- WIRING – Wiring layouts of different types
- PUMP INSTALLATIONS
- Installation And Maintenance Of Generators, Electric Motors, Transformers Etc.
- TESTING AND FAULT ATTENDANCE – (Elementary knowledge) Detection and location of faults in D.C. &