

SOUTH EASTERN COALFIELDS LIMITED/ साउथ ईस्टर्न कोल फील्ड्स लिमिटेड
SYLLABUS FOR MINING SIRDAR EXAMINATION /माइनिंग सरदार परीक्षा के लिए पाठ्यक्रम

Total Marks: 100,

कुल अंक : 100

The time duration of the examination: Two Hours (120 Minutes)

Number of Questions: 100,

प्रश्नों की संख्या : 100

Every question contains- One mark

प्रत्येक प्रश्न के लिए एक अंक निर्धारित

परीक्षा के लिए निर्धारित समय: दो घंटे (120 मिनट्स)

Type of Examination परीक्षा का प्रकार	SN	Name of subject विषय का नाम	Marks Distribution अंक वितरण
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Written Examination (MCQ) लिखित परीक्षा (बहु विकल्पीय प्रश्न)	Part -A.	Subject Knowledge	<ul style="list-style-type: none"> • Subject / Technical Knowledge • Definitions: परिभाषाएं • Safety Management Plan(SMP): सुरक्षा प्रबंध योजना (सेफ्टी मैनेजमेंट प्लान) • Duties and Responsibilities of workmen, competent persons, and officials: कामगार, सक्षम व्यक्ति और पदाधिकारियों के कर्तव्य एवं जिम्मेदारियाँ • Duties and Responsibilities of Mining Sirdar: माइनिंग सरदार के कर्तव्य एवं जिम्मेदारियाँ • Basic Information related to various Mine Plans: खान के विभिन्न नक्शों से संबंधित सामान्य जानकारीयाँ • Provisions of Winding in shaft: चानक में वाइंडिंग के प्रावधान • Provisions of Haulage , Belt and haulage/belt roadway: हॉलेज, कनवेयर बेल्ट व हॉलेज/ कनवेयर बेल्ट रास्ते के प्रावधान • Provisions of Travelling roadway: आवागमन के रास्ते के प्रावधान • Development work and Depillaring operation: डेवलपमेंट कार्य व डिपिलरिंग संचालन/कार्यवाही • Extraction of coal other than Bord and Pillar method: बोर्ड व पिलर विधि के अतिरिक्त अन्य विधि से कोयला निकालना • Setting and withdrawal of supports: सपोर्ट का लगाना व खोला जाना • Opencast Working and Mechanized Opencast working: खुली खान व मशीनीकृत खुली खान की कार्यविधि • Precautions against Danger of fire, Gas, Dust and Water: आग, गैस, डस्ट व पानी के खतरों से संबंधित सावधानियाँ • Ventilation, Lighting and Flame Safety Lamp: संवातन (वेंटिलेशन), प्रकाश (लाइटिंग) एवं फ्लेम सेफ्टी लैप • Precautions related to Explosives and shot firing: बारूद एवं शॉट फायरिंग से संबंधित सावधानियाँ 	80 Marks

			<ul style="list-style-type: none"> • Fencing and Gates: बाड़ व द्वार (फेंसिंग व गेट्स) • General safety to be ensured by persons employed in Mines: खान में नियोजित व्यक्तियों द्वारा सामान्य सुरक्षा की सुनिश्चितता • Use of Personal Protective Equipment (PPE): खान में काम करने वाले व्यक्तियों द्वारा व्यक्तिगत सुरक्षा संरक्षक सामान का उपयोग/ व्यवहार • First Aid: प्राथमिक सहायता • Blasting Card System: विस्फोटन कार्ड प्रणाली (ब्लास्टिंग कार्ड सिस्टम) • Safe operating Procedure (SOP): सुरक्षित कार्य शैली • Pit Safety Committee: खान सुरक्षा समिति • Workmen Inspector: कामगार निरीक्षक • Drinking water: पीने का पानी • Other applicable statutory provisions: अन्य लागू वैधानिक प्रावधान 	
	Part -B (i)	General Knowledge regarding CIL/SECL/STATE कोल इंडिया/एसईसीएल/ राज्य से संबंधित जागरूकता व ज्ञान	<ul style="list-style-type: none"> • Knowledge of CIL/SECL related questions & Knowledge of CG State & MP State related questions सीआईएल/एसईसीएल से संबंधित प्रश्नों का ज्ञान और छत्तीसगढ़ राज्य और मध्य प्रदेश राज्य से संबंधित प्रश्नों का ज्ञान। 	10 Marks
	Part -B (ii)	General Awareness सामान्य जागरूकता	<ul style="list-style-type: none"> • Authors & Books: लेखक व पुस्तकें • Culture: संस्कृति • Current Affairs: सामयिक घटनाएं • Indian constitution: भारतीय संविधान • Neighboring countries: पड़ोसी देश • History: इतिहास • Geography: भूगोल • Science: विज्ञान • Sports: खेलकूद • General Information: सामान्य जानकारी • Average: औसत • Volume & Surface Area: आयतन व सतह (पृष्ठ) क्षेत्रफल 	10 Marks

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| | | <ul style="list-style-type: none">• Simple & compound Interest: साधारण व मिश्रित ब्याज• Profit & Loss: लाभ व हानि• Percentage: प्रतिशत• Time, Distance & Work: समय, दूरी व कार्य• Mensuration: क्षेत्रमिति• Ratio & Proportion: अनुपात व समानुपात• Roots & Under roots: वर्ग व वर्गमूल• Alphabet Test: वर्णमाला परिक्षण• Clocks & Calendar: घडी व कैलेंडर• Data Interpretation : डेटा व्याखा• Decision Making: निर्णय लेना• Direction: दिशा | |
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SOUTHEASTERN COALFIELDS LIMITED/साउथ ईस्टर्न कोलफील्ड लिमिटेड
SYLLABUS FOR SURVEYOR EXAMINATION/ माइन सर्वेयर परीक्षा के लिए पाठ्यक्रम

Total number of Marks:100

Number of questions:100

Each question carry – one mark

कुल अंक : 100

(सौ) प्रश्नों की संख्या: 100(सौ)

प्रत्येक प्रश्न के लिए निर्धारित अंक : एक

The time duration of the examination : **Two Hours(120 Minutes)** परीक्षा के लिए निर्धारित समय : दो घंटे (120 मिनट्स)

Type of Examination	SN	Name of the Subject	Brief	Marks distribution
Written Examination (MCQ) लिखित परीक्षा (बहु विकल्पीय प्रश्न)	A	Subject Knowledge विषय ज्ञान	<ul style="list-style-type: none"> • Definitions: परिभाषाएं • Duties and responsibilities of Surveyor as per Coal Mines Regulation 2017: सर्वेयर के कर्तव्य एवं जिम्मेदारियाँ • PLANS – Type of Statutory Mine Plans as per Coal Mines regulation 2017 and Records, Preparation of Mine Plans, Study of Mine Plans, accuracy in underground & Surface Surveying as per Statute , Plan accuracy .Knowledge of DGMS Circulars and Coal mines regulations-2017 related to Survey and Mine Plans.: प्लान्स- वैधानिक प्लान्स के प्रकार एवं रिकार्ड्स,माइन प्लान्स की तैयारी, माइन प्लान्स को पढना, माइन प्लान्स एवं सर्वे से सम्बंधित डीजीएमएस सर्कुलर्स व कोयला खान विनियम के प्रावधानों का ज्ञान तथा जानकारी. • Importance of Surveying , Classification of surveying , Use of Survey , Technical terms , Principle of surveying, purpose of survey • DISTANCE MEASUREMENT – Chain , tape and other means of linear measurement , Source of errors and precautions in distance measurement . लीनियर मेसमेंट- दूरी व रेंजिंग नापने के लिए यन्त्र • ANGULAR MEASUREMENT – Bearing of Lines, Magnetic declination etc. एंगुलर मेसमेंट- लाइन्स का बेअरिंग, मैग्नेटिक डिक्लेरेशन इत्यादि, • THEODOLITE – Modern Theodolites, Classification of theodolite, Measurement of horizontal and vertical angles, Theodolite traversing Traverse calculation, Computation of Co-ordinates, adjustment of Traverse, Temporary and permanent adjustments. थेडोलाइट - आधुनिक थेडोलाइट, क्षैतिज व उर्ध्व कोणों का नाप, थेडोलाइट ट्रेवर्सिंग गणना, को-ओर्डिनेट की गणना, ट्रेवर्स का एडजस्टमेंट (स्थायी व अस्थायी एडजस्टमेंट) 	80 Marks

		<ul style="list-style-type: none"> • TOTAL STATION – Electronics Distance measurement , Principle of EDM , Surveying by Total Stations, theory of Errors, adjustments, and applications use and care of instrument & maintenance of survey instruments . (टोटल स्टेशन- उपयोग, इसर एडजस्टमेंट व सर्वेयिंग) • LEVELLING – Levelling Instruments, Types of Levelling, Booking of Readings, Temporary and Permanent adjustment, Levelling of Moderate and steep inclined and vertical workings, Gradient of Drifts and Roadways, Subsidence Survey. • CONTOURING – Calculation and Plotting. • TACHEOMETRY SURVEY :- Principle of methods of tacheometry Instruments used and accuracy. • TRIANGULATION :- Basis Principle and classification of triangulation, Reconnaissance , Measurement of horizontal and vertical angles and base line in tertiary triangulation computations and adjustments . • Topographic Survey • Survey Adjustment & Theory of errors . • Projection :- Lamberts orthomorphic , Cassini , Universal Transverse Mercator Projection NATIONAL GRID and Transfer and correlation of National Grid, Map projection. - • Determination of True North. • Underground levelling ,seam contours , subsidence levelling ,Underground traversing, First ,Second and Third order traverse. • Opencast survey , General , Control frame work and development of opencast survey , determination of volume of overburden and extracted minerals • Calculation of Area and Volume – Area and Volumes of Coal Stock, OBR, Sumps, Catchment area etc., Different methods and limitations, CIL guidelines regarding Coal stock and OBR measurements. • DIP, STRIKE AND FAULT PROBLEMS – Dip, Strike and Fault problem, Knowledge about different types of Faults and dangers related to Mine Workings. 11- • Slope stability monitoring in OC Mines. • Application of Software (Survey & Mapping software , GIS , CAD Software)and Use of computer in mine surveying . • Elementary Knowledge in 3DTLS (3D Terrestrial laser instruments) , LIDAR SURVEY ,Global Positing system (GPS), Photogrammetric surveying and Instrument for GNSS survey (DGPS System) , Drones surveys & GIS (Geographical information system) . 	
B-	Knowledge regarding		10 Marks

		CIL/SECL/States (Chhattisgarh & Madhya Pradesh) कोल इंडिया/ एसईसीएल/राज्य (छत्तीसगढ़ व मध्यप्रदेश) से संबंधित ज्ञान		
	C-	General Awareness सामान्य जागरूकता		10 Marks

Syllabus for the Computer Based Test for Open Recruitment to the post of Electrical Supervisor T&S Grade-C

Syllabus for: -

Part – A

Marks – 80

Subject Knowledge – 1 to 4

Annexure – I

1. Electrical theory (Elementary Knowledge):-

- **Principle of Electricity** –Electric voltage, current and resistance, Ohm's law and explanation-Specific resistance - Kirchhoff's – Wheatstone's bridge - Meter bridge., law of resistance and their application for calculating voltage drop, series and parallel circuit, practical unit of voltage, current, resistance, inductance, capacitance, power and energy. Relation between electric power unit(KW) and mechanical power unit(HP). Work, Power, Energy and Heating effects of Electric Current. Conductance- Conductivity – effects of temperature on resistance.
- **Electro Magnetism** – Concept of electro magnetic force(EMF), Production of E.M.F., Fleming's right and left hand rules, Natural and artificial magnets – magnetic field and magnetic lines of force – Coulomb's inverse square law – Permeability – Magnetic materials. Magnetic properties of material, electromagnets and their application.
- **Electrical Materials** – Conductors, semiconductors and insulated material and their relative merits, transformer oil, effect of heat and moisture on insulation, lubricants and their uses.
- **Generation of electricity**- Source of natural energy, Renewable and non-renewable source method of production of electricity AC and DC.
- **Controlling and Switch Gears**- Knowledge of various type of switches, circuit breakers, cutouts, starters, protective devices for both AC and DC motors and their wiring. Wiring Tools and Accessories, Electrical Wiring Joints.
- **Transformer**- Knowledge of single phase and three phase transformers, their construction, use and maintenance. Phasing out, parallel working, transformer tapings, temperature rise, instrument transformer. Auto-transformers. Testing of transformers.
- **Conversions**- Principle of operation of motor generator sets, Conversion Techniques- star and delta circuits, Solve problems on Star Delta Transformation.
- **D.C./A.C. Generators**- Essential components and constructional features, shunt, series and compound dynamos and their characteristics, causes for sparking. Interpoles,

commutators and their maintenance, carbon brushes, their adjustment and care. Methods of voltage regulation. Condition of parallel operation.

- **Batteries-** Primary cell, dry cell, storage or secondary batteries or accumulators and their installation, Lead acid cell, nickel, iron or alkaline cell. Initial and subsequent charging of batteries. Charging circuit and their calculation, series and parallel ckt. Maintenance of batteries, use of hydrometers.
- **A.C. Motors-** Theory of induction (squirrel and slip-ring type), synchronous and commutator motors, their uses, method of starting, speed control and reversal of direction.
- **D.C. Motors-** Theory of shunt, series and compound wound type motors, their uses, installation, method of starting, speed control and reversal of direction.
- **A.C. Circuits-** Knowledge of vector group, phase and phase difference. Resistance, inductance and capacitance in AC circuit. Periodicity or frequency, power and power factor. Single phase and three phase system. star delta connection, phase sequence.
- **Illumination-** Metal filament lamp, fluorescent lamp circuit. Photometric units and simple measurements, general requirement of efficient lighting and elementary calculation. Street lighting and time switches.

Transmission & Distribution: -

- a) DC and AC power supply for auxiliaries, arrangement of unit auxiliaries and station service board, station lighting and automatic changeover, station batteries and charging methods. Standby and emergency power and lighting system.
- b) Control and Protection- Sequential operation & interlocks, general machine, start/stop, sequence of operation.
- c) Testing and Measurement- Working principle and basis of instrument and measurements. Details of measuring instrument for pressure, flow, temperature, level, vibration alignment and current, voltage, power, reactive power, frequency, energy, winding temperature, auto controllers, recorder, insulation, tester, its use of primary detection of faults, data acquisition system, digital distributed control, UPS etc. Testing of electrical and mechanical testing equipment's.
- d) Fire safety procedure, fire protection of generator, transformers, and firefighting. Protection and restoration of persons suffering from electric shock.

2. Electricity Utilization for:-

Industrial Installation-

- **Wiring-** Wiring layout of different types such as cleat, metal sheathed, wood casing and capping, cap type sheathed, conduit and armored cable for lighting and power installation in industrial premises together with the necessary switchgear, Wiring of appliances.

- **Simple Calculation** - Simple calculation relating to cost of power and energy, elementary knowledge of method of charging for demand and energy, electrical power tariff.
- **Testing and Fault Attendance**- Detection and location of faults in AC and DC circuits, motor, overhead lines and cables, electric instruments, and apparatus. Rectification of fault, insulation and continuity tests, earth resistance.
- **Protective Devices**- Elementary knowledge of earthing of generator, motors, transformers. Use of lightning arrestors, fuse, including high rupturing capacity fuses, cutouts, circuit breakers, over load and no voltage protection, thermal overload, earth leakage & earth fault protection and different types of protective relays. Earthing system.
- **Circuit Diagram**- Electrical connection for AC and DC Motors, their starters, main and sub-distribution board with circuit breakers, switches, fuse, MCB, MCCB, battery charging equipment's, rectifiers.
- **Pumps**- General principal and elementary calculation of head, power and energy requirement for centrifugal pump.
- **Power and Energy Measurement and Charges**- Measurement of power, wattmeter, energy meter both AC and DC, power factor correction by capacitor.
- **Apparatus**- Installation and maintenance of generator, motor, transformers, pumps, electric welding, cooling and heating appliances.

Domestic installation-

- **Apparatus**- Installation and maintenance of heaters, coolers, refrigerator, and other domestic appliances. Electric bell and indicators, Electric fan.
- **Wiring**- Wiring layout of different types such as cleat, metal sheathed, wood casing and capping, cap type sheathed, conduit and armored cable for lighting and power installation in residential area together with the necessary switchgear, MCB, Wiring of temporary and portable appliances.
- **Circuit Diagram**- Electrical connection of various circuit for (i) House wiring including those for main and sub-distribution board, switches and cutout etc.
- **Simple Calculation** - Simple calculation relating to cost of energy, load calculations etc.
- **Testing and Fault Identification**- Detection and location of faults in domestic appliance and wiring installation. Insulation and continuity test, rectification of fault, insulation and continuity tests, earth resistance.
- **Protective Devices**- Elementary knowledge of the use of fuses and cutouts, earthing of domestic appliances, motor etc. use of lightning arrestors, earthing systems.

3. HT Power Supply:-

a) HT Cables- 11 KV & 33KV and Control Cables: -

- Criteria for selection of power cables, types of cables, cable laying, terminals, jointing, plumbing of cables.
- Underground and surface junction boxes. Fault locating in cables, power cable sheath fault. Equipment used & methodology for location fault in cable etc.

b) HT Sub-station and Control Room: -

- Layout, design, HT Transformer and associated equipment's (i.e., CBs, Insulators, LAs, Capacitors, CTs and PTs). Sub-station, sub-station earthing, earthing mat, tower grounding.
- Power and distribution transformers, their erection, testing and commissioning, fault location and maintenance.
- Protective relays and measuring equipment's and their working.
- Testing, fault location, maintenance and protection of HT cables and measuring equipment.
- Design and installation of capacitor bank and their maintenance.
- Erection, testing, commissioning, and maintenance of control room equipment's including station batteries and communication system.
- Maintenance of earth pit, LA, fire fighting systems.

c) HT Overhead line – 11KV & up to 33KV: -

- Survey, design, construction standard, foundation erection testing and commissioning.
- Testing, fault location, commissioning, maintenance, and protections, including safety devices and testing equipment's.
- Selection of supports, cross arm brackets, stay, struts, insulators, and associated hardware.
- Type and size of conductor, length of spans, sag, spacing of conductors, effect of temperature, wind pressure, ice and snow on tension of conductors, lighting on conductors.
- Knowledge about construction standards of overhead lines, sub-station and other equipment's utilized in this HT system.

- General requirement of earthing, guard wires, relays and other protective devices, size of earth conductors, pole earthing, lightning arresters, and maintenance of LA

4. Other Basic Knowledge; -

- a) Operational knowledge on measuring instrument i.e., oscilloscopes, ammeters, voltmeters, millimeters, tongue tester, meggers, and HV testing kits.
- b) Tariffs, energy charges, power factor, penalty – Chhattisgarh state and MP state.

Part – B

- a) **General Knowledge - Regarding CIL/SECL related questions & Chhattisgarh state & MP State related questions** **Marks 10**
- b) **General Awareness - Mental ability/Quantitative ability/Logical & Reasoning skills** **Marks 10**