NCL Syllabus

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NCL Technician And Supervisor Exam Syllabus 2022

Part A

Electrical Fundamentals: Ohm's Law, Kirchhoff's Laws, Series & Parallel combination of Resistors, Inductors & Capacitors. Wheatstone bridge, PVC wires, Conductors & cables. Wire joints, Soldering, Heating, lighting, magnetic & chemical effect of electric current.Joule's law.Electrolysis & its laws. Cells and Batteries- Primary & secondary cell, Lead Acid battery, Hybrid cell, Alkaline cell. Charging of battery. Care & Maintenance of Battery.

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Magnetic Circuits: Terminology used in the magnetic circuit, Principle of the electromagnet, Capacitor & its types. Faraday's laws of Electromagnetic Induction.Fleming's rule, B-H Curve.RLC circuit –series & parallel resonance.

DC Generators: Working Principle, Type series, Shunt, and Compound Generator. EMF equation, characteristics, communication, efficiency, regulation, and application.

DC Motors: Principle, Types- Series, Shunt & Compound Motors. Characteristics curve, commutation.Applications of DC motors. The necessity of starter, Working of starters (3 points & 4 points). Speed control of DC Shunt motor (armature & Field control). Troubleshooting –Care and maintenance.

Active & Reactive Power: Calculation for Work, Power & Energy, Power factor.Causes & effects of low power factor. Methods of Improving power factor. Calculation of capacitor banks.Automatic power factor correction (APFC) Panels. Three-phase three wires & three phases four wires system. Three-phase Power.

Transformers: Working Principle, Construction. Classification of Transformers, EMF equation, rating, Loading, Losses & Efficiency Regulation, Parallel Operation, Cooling methods, Transformer oil testing. Care and maintenance, Protective devices. Tap Changer –ON load and OFF load. Autotransformer, Instrument Transformer- CT & PT, Welding Transformer.

Measuring Instruments: PMMC, MI Meters working principle, and construction. Digital meters.Megger Earth tester, Multimeter.Calibrations of meters. The terminology used in Illumination and calculations. Types of Lamps-Incandescent Lamp and Discharge Lampfluorescent, HPMV, HPSV Lamps. Drum Switch, Lighting calculations, Energy-efficient lighting systems (CFL, LED, etc.), Two wattmeter methods of 3 phase power measurement.

Semiconductor Devices: Diodes, Characteristics, Zener diode, Rectifiers & filter circuits.

Squirrel Cage & Wound Rotor type Induction Motor: Construction, parts, working principle, Concept of rotating magnetic field, Applications. Types of starters-DOL, Star delta, Autotransformer starter, etc.Rotor resistance type starter. Introduction to Speed control of 3 phase Induction motor. Torque-

speed characteristics. Losses, efficiency, Classification, Working Principle & uses.AC Motor stator Rewinding.Single-phase & Three-phase winding development diagram

Synchronous Motor: Construction, Working Principle, Starting Method. Effect of change of excitation on load. V-curve and Inverted V -curve. Power factor correction.

Electrical Drives: DC drive. AC drive. Preventive Break down Maintenance of DC / AC machines, Voltage stabilizer, UPS, Inverter.

Basics of Wiring: Power & control circuits wiring. Machine control cabinet /control panel layout, assembly. Control elements- Push button switches, contactor, overload relay, etc. Concept of neutral and earth.Earthing, types, methods of reducing earth resistance, Earth tester.Star & Delta connections.Concept-Principle of plan estimation and cost-preparation of wiring layout domestic/Industrial/Commercial. I.E rules for multi-storeyed buildings. National Electrical Code, SWG, common electrical Accessories – MCB, ELCB, MCCB, RCCB etc. Comparison of different types of wirings. Installation, Testing methods – Wiring estimations & cost.

Basics of Thermal Power: Plant layout, components, and working principle of the thermal power plant.

Non-conventional energy resources: Working principle of Wind and solar power generation.

Electrical Substation: Single Line Diagram of Substations. Electric supply system EHVAC transmission. Advantages of high voltage transmission Overhead lines: - Poles& Towers, bushings, Insulators & its types. Corona effect, Bundle conductors, Sag, Skin effect&Ferranti effect. Fault studies. 3 phase service- cable fault. Sub- Station HT/LT –Function, equipment, types of the distribution system. Protective relays- overcurrent, IDMT, overvoltage, differential, distance relay. Circuit breakers-lightning arrestor used in HT line. Cable- different types of cables, cable rating, derating factor. Fire Fighting, Safely handling Tools & Equipment, Rescue of person who is in contact with a live wire, Treat a person for electric shock/ injury.

Part B

General Intelligence

- Figurative Classification
- Blood Relations
- Arithmetical Reasoning
- Classification
- Venn diagrams
- Figural Pattern
- Number, Ranking & Time Sequence
- Non-Verbal Series
- Number Ranking
- Analogies
- Coding-Decoding
- Logical Venn Diagrams

- Cubes and Dice
- Directions
- Mathematical Operations
- Arrangements
- Number Series

Aptitude

- Numbers and Ages
- Indices and Surds
- Problems on Trains
- Ratio and Proportion
- Areas
- Time and Work Partnership
- Pipes and Cisterns
- Permutations and Combinations
- Problems on Numbers
- Averages
- Mixtures and Allegations
- Simple Interest
- Volumes
- Time and Distance Mensuration
- Probability
- Percentages
- Profit and Loss
- Simple Equations
- Problems on L.C.M and H.C.F
- Compound Interest
- Boats and Streams
- Odd Man Out
- Simplification and Approximation
- Quadratic Equations

Mental Ability

- Verbal Reasoning
- Summary Questions
- Sequence
- Missing Characters
- Reading Comprehension
- Blood Relations
- Logical Sequence of Words
- Jumbled Paragraphs/Para-jumbles
- Assertion & Reason
- Classification

- Coding and Decoding
- Data Interpretation (Tables, Charts, Graphs)
- Logical Venn Diagram
- Spontaneous Reaction Tests
- Number Series
- Data Sufficiency
- Puzzles
- Analogy
- Logical Reasoning
- Caselets
- Direction

NCL Technician And Supervisor Written Test Exam Pattern 2022-Stage I

In the below-mentioned table, we have listed down the exam pattern of the written test (Stage-1) of the NCL Technician And Supervisor Exam 2021. Candidates are advised to take note of it before they start the preparation of the exam.

Part	Subject Names	No of marks	Exam Duration
Part A	Technical Subjects	70	45 minutes
Part B	General Section(General Intelligence, Mental Ability, Aptitude, etc.)	30	45 minutes
-	Total	100 marks	90 minutes

NCL Technician and Supervisor Interview

- The personal interview will be the last stage of the NCL Technician And Supervisor exam. The candidates who clear the written examination will be called up for the interview process.
- In this stage, the candidate's mental and social traits will be tested by asking questions of general interest. Some of the qualities that the board looks for are mental alertness, critical powers of assimilation, clear and logical exposition, a balance of judgment, variety, and depth of interest, the ability for social cohesion, and leadership.
- The NCL Technician And Supervisor interview will be the last stage and the final merit list will be made based on the NCL Technician And Supervisor Interview Marks.
- Candidates must make sure to be confident and be self-aware at all times.

Candidates must be having a clear idea of how to check the NCL Syllabus and Exam Pattern 2022. Candidates preparing for the exam can also download our Adda247 App and be ready for any test.