

writing subject to production of a certificate to the effect that person concerned has limitation to write and that scribe is essential to write examination on his/her behalf from the competent medical authority of a Government healthcare institution as per proforma at **Form-XV**.

**B.** The qualification of the scribe should be one step below the qualification of the candidate taking examination. The person opting for own scribe should submit details of the own scribe as per proforma at **Form-XVI**.

**(iii) Guidelines for candidates with locomotor disability and cerebral palsy**

A compensatory time of 20 minutes per hour or otherwise advised shall be permitted for the candidates with locomotor disability and cerebral palsy where dominant (writing) extremity is affected to the extent of slowing the performance of function (minimum of 40% impairment)

**(iv) Guidelines for Visually Impaired candidates**

- Visually Impaired candidates (who suffer from not less than 40% of disability) may opt to view the contents of the test in magnified font and all such candidates will be eligible for compensatory time of 20 minutes or otherwise advised, for every hour of examination.
- The facility of viewing the contents of the test in magnifying font will be available to Visually Impaired candidates.

**These guidelines are subject to change in terms of GOI guidelines/ clarifications, if any, from time to time.**

**C. ONLINE EXAMINATION**

**I. The structure of the Online examination will be as follows:**

**Assistant Engineer (Civil/Electrical)**

Sr. No.	Name of the Tests (Not By sequence)	No. Of questions	Maximum Marks	Medium of Exam	Time allotted for each test (Separately timed)
1.	Reasoning and Computer Aptitude	20	20	Hindi and English	25 Minutes
2.	English Language	25	25	English	25 Minutes
3.	Data Analysis & Interpretation and Quantitative Aptitude	25	25	Hindi and English	30 Minutes
4.	General Awareness	20	20	Hindi and English	15 Minutes
5.	Professional Knowledge	55	110	Hindi and English	55 Minutes
	<b>Total</b>	<b>145</b>	<b>200</b>		<b>2 Hours 30 Minutes</b>

**Accountant**

Sr. No.	Name of the Tests (Not By sequence)	No. Of questions	Maximum Marks	Medium of Exam	Time allotted for each test (Separately timed)
1.	Reasoning and Computer Aptitude	40	40	Hindi and English	45 Minutes
2.	English Language	35	35	English	25 Minutes
3.	Data Analysis & Interpretation and Quantitative Aptitude	40	40	Hindi and English	45 Minutes
4.	General Awareness	20	20	Hindi and English	15 Minutes
5.	Professional Knowledge	65	65	Hindi and English	50 Minutes
	<b>Total</b>	<b>200</b>	<b>200</b>		<b>3 Hours</b>

**Superintendent (General)**

Sr. No.	Name of the Tests (Not By sequence)	No. Of questions	Maximum Marks	Medium of Exam	Time allotted for each test (Separately timed)
1.	Reasoning and Computer Aptitude	50	50	Hindi and English	50 Minutes
2.	English Language	50	50	English	30 Minutes
3.	Data Analysis & Interpretation and Quantitative Aptitude	50	50	Hindi and English	45 Minutes

4.	General Awareness	50	50	Hindi and English	25 Minutes
	<b>Total</b>	<b>200</b>	<b>200</b>		<b>2 Hours 30 Minutes</b>

#### **Junior Technical Assistant**

Sr. No.	Name of the Tests (Not By sequence)	No. Of questions	Maximum Marks	Medium of Exam	Time allotted for each test (Separately timed)
1.	Reasoning and Computer Aptitude	40	40	Hindi and English	35 Minutes
2.	English Language	35	35	English	20 Minutes
3.	Data Analysis & Interpretation and Quantitative Aptitude	40	40	Hindi and English	35 Minutes
4.	General Awareness	20	20	Hindi and English	10 Minutes
5.	Professional Knowledge	65	65	Hindi and English	50 Minutes
	<b>Total</b>	<b>200</b>	<b>200</b>		<b>2 Hours 30 Minutes</b>

**Syllabus for Professional Knowledge test (wherever applicable) (This is only a Broad/Indicative syllabus and it may slightly change in the examination):**

#### **Syllabus for Assistant Engineer (Civil) [Post Code-1]**

##### **A. Structural Engineering (20 marks)**

- Engineering Mechanics
- Strength of Material
- Structural Analysis
- Engineering Material (other than concrete and steel)
- Concrete Structures, Design & IS Codes
- Steel Structures, Design & IS Codes

##### **B. Geotechnical Engineering & Geomatics Engineering (20 marks)**

- Soil Mechanics
- Foundation Engineering
- Soil Improvement Techniques

##### **C. Water Resources Engineering (10 marks)**

- Fluid Mechanics
- Hydraulics
- Hydrology
- Irrigation

##### **D. Environmental Engineering (10 marks)**

- Water and Waste Water
- Air Pollution
- Municipal Solid Wastes
- Noise Pollution

##### **E. Transportation Engineering (20 marks)**

- Transportation Infrastructure
- Highway Pavements
- Traffic Engineering

##### **F. Surveying (10 marks)**

- Principles of surveying
- Maps
- Distance and angle measurement
- Traversing and triangulation survey
- Horizontal and vertical curves
- Basics of GIS and GPS

**G. Project Management & Planning (10 marks)**

**H. Concrete technology and prestressed concrete (10 marks)**

**Syllabus for Assistant Engineer (Electrical) [Post Code-2]**

**A. Electric Circuits (17 marks)**

- i. Network graph
- ii. KCL, KVL, Node and Mesh analysis
- iii. Transient response of dc and ac networks
- iv. Sinusoidal steady-state analysis
- v. Resonance, Passive filters, Ideal current and voltage sources
- vi. Thevenin's theorem, Norton's theorem, Superposition theorem, Maximum power transfer theorem
- vii. Two-port networks, Three phase circuits, Power and power factor in ac circuits.

**B. Electromagnetic Fields (7 marks)**

- i. Coulomb's Law, Electric Field Intensity, Electric Flux Density
- ii. Gauss's Law, Divergence
- iii. Electric field and potential due to point, line, plane and spherical charge distributions
- iv. Effect of dielectric medium
- v. Capacitance of simple configurations
- vi. Biot-Savart's law, Ampere's law, Curl, Faraday's law, Lorentz force
- vii. Inductance, Magnetomotive force, Reluctance, Magnetic circuits
- viii. Self and Mutual inductance of simple configurations.

**C. Signals and Systems (7 marks)**

- i. Representation of continuous and discrete-time signals
- ii. Shifting and scaling operations
- iii. Linear Time Invariant and Causal systems
- iv. Fourier series representation of continuous periodic signals
- v. Sampling theorem, Applications of Fourier Transform, Laplace Transform and z-Transform.

**D. Electrical Machines (16 marks)**

- i. Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency
- ii. Three phase transformers: connections, parallel operation
- iii. Auto-transformer, Electromechanical energy conversion principles
- iv. DC machines: separately excited, series and shunt, motoring and generating mode of operation and their characteristics, starting and speed control of dc motors
- v. Three phase induction motors: principle of operation, types, performance, torque-speed characteristics, no-load and blocked rotor tests, equivalent circuit, starting and speed control
- vi. Operating principle of single-phase induction motors
- vii. Synchronous machines: cylindrical and salient pole machines, performance, regulation and parallel operation of generators, starting of synchronous motor, characteristics
- viii. Types of losses and efficiency calculations of electric machines.

**E. Power Systems (17 marks)**

- i. Power generation concepts, ac and dc transmission concepts
- ii. Models and performance of transmission lines and cables
- iii. Series and shunt compensation
- iv. Electric field distribution and insulators
- v. Distribution systems, Per-unit quantities, Bus admittance matrix
- vi. Gauss-Seidel and Newton-Raphson load flow methods
- vii. Voltage and Frequency control, Power factor correction
- viii. Symmetrical components, Symmetrical and unsymmetrical fault analysis
- ix. Principles of over-current, differential and distance protection
- x. Circuit breakers, System stability concepts, Equal area criterion.

**F. Control Systems (16 marks)**

- i. Mathematical modelling and representation of systems
- ii. Feedback principle, transfer function, Block diagrams and Signal flow graphs
- iii. Transient and Steady-state analysis of linear time invariant systems
- iv. Routh-Hurwitz and Nyquist criteria, Bode plots, Root loci
- v. Stability analysis, Lag, Lead and Lead-Lag compensators
- vi. P, PI and PID controllers
- vii. State space model, State transition matrix.

**G. Electrical and Electronic Measurements (16 marks)**

- i. Bridges and Potentiometers
- ii. Measurement of voltage, current, power, energy and power factor
- iii. Instrument transformers, Digital voltmeters and multimeters, Phase, Time and Frequency measurement
- iv. Oscilloscopes, Error analysis.

**H. Analog and Digital Electronics (7 marks)**

- i. Characteristics of diodes, BJT, MOSFET
- ii. Simple diode circuits: clipping, clamping, rectifiers
- iii. Amplifiers: Biasing, Equivalent circuit and Frequency response
- iv. Oscillators and Feedback amplifiers
- v. Operational amplifiers: Characteristics and applications
- vi. Simple active filters, VCOs and Timers, Combinational and Sequential logic circuits, Multiplexer, Demultiplexer, Schmitt trigger, Sample and hold circuits, A/D and D/A converters
- vii. 8085 Microprocessor: Architecture, Programming and Interfacing.

**I. Power Electronics (7 marks)**

- i. Characteristics of semiconductor power devices: Diode, Thyristor, Triac, GTO, MOSFET, IGBT
- ii. DC to DC conversion: Buck, Boost and Buck-Boost converters; Single and three phase configuration of uncontrolled rectifiers, Line commutated thyristor-based converters
- iii. Bidirectional ac to dc voltage source converters, Issues of line current harmonics
- iv. Power factor, Distortion factor of ac to dc converters, Single phase and three phase inverters, Sinusoidal pulse width modulation.

**Syllabus for Accountant [Post Code -3]****A. Financial Accounting (35 marks)**

- i. Indian Accounting Standards (Ind As) notified by MCA under Companies Act, 2013.
- ii. Accounting Process and GAAP
- iii. Accounting of Income, expense, Assets & liabilities.
- iv. Preparation of Bank reconciliation statement.
- v. Rectification entries & disclosure notes in annual accounts.
- vi. Cash flow statement.
- vii. Format of preparation of final accounts of company.
- viii. Banking operations: Transaction & Accounting.
- ix. Pay Roll accounting
- x. Nature and functions of Cost Accounting and methods of cost control/cost reduction.

**B. Taxation (20 marks)**

- i. Income Tax: Concept and various provisions as per Income Tax Act, 1961.
- ii. Salient features/ provisions related to Goods & Services Tax Act, 2017

**C. Auditing (10 marks)**

- i. Auditing: Concept
- ii. Company Audit
- iii. Audit reports and Audit Certificates
- iv. Ledger Scrutiny
- v. Internal Control

**Syllabus for Junior Technical Assistant, Junior Technical Assistant- SRD (NE) and Junior Technical Assistant- SRD (UT of Ladakh) [Post Code -5,7 and 8]**

- Basic Agriculture (20 marks)** - Crop Production, Animal Husbandry, Plant Protection, Agriculture Extension, Horticulture, Agriculture Economics
- Botany (10 marks)** – Cell Biology: Tissue, Organ & Organ System, Genetics, Plant Classification, Diversity, Ecology, Life Process: Photosynthesis, Respiration, Circulation, Movement etc.
- Zoology (20 marks)** – Insect: Morphology, Physiology, Taxonomy. Organ System, Heredity & Variation, Micro Organisms, Storage & Public Health, Insects & Rodents, Insecticides, Toxicology
- Chemistry (10 marks)** – Chemical bonding, Organic Chemistry, Inorganic Chemistry, Biochemistry
- Physics (5 marks)** - Motion, Force & Energy, Electricity, Magnetism, Light & Sound, Thermodynamics, Measurement.

CWC reserves the right to modify the structure of the examination which will be intimated through its website. Other detailed information regarding the examination will be given in an Information Handout, which will be made available for the candidates to download along with the call letters from the authorised CWC website [www.cewacor.nic.in](http://www.cewacor.nic.in)

Please note that candidates will not be permitted to appear for the online examination without the following documents:

1. Valid Call Letter for the respective date and session of Examination
2. Photo-identity proof (as specified) in original bearing the same name as it appears on the call letter/application form.
3. Photocopy of photo-identity proof (as mentioned in (2) above)

Candidates reporting late i.e. after the reporting time specified on the call letter for Examination will not be permitted to take the examination.

The reporting time mentioned on the call letter is prior to the start time of the test. Though the duration of the examination is 60 to 180 minutes according to the posts, the candidates may be required to be at the venue for upto 4 hours or more including the time required for completion of various formalities such as verification and collection of various requisite documents, biometric data capturing, logging in, giving of instructions etc. and including disruptions beyond control.

**a) Penalty for Wrong Answers**

There will be penalty for wrong answers marked in the Objective Tests. For each question for which a wrong answer has been given by the candidate, one fourth ( $1/4^{\text{th}}$ ) of the marks assigned to that question will be deducted as penalty to arrive at corrected score. If a question is left blank, i.e. no answer is marked by the candidate; there will be no penalty for that question.

**b) Examination Centres**

- (i) The examination will be conducted online in venues across centres in India. The tentative list of Examination centres is available in **Annexure I**.
- (ii) No request for change of centre for Examination shall be entertained.
- (iii) CWC, however, reserves the right to cancel any of the Examination Centres and/ or add some other Centres, at its discretion, depending upon the response, administrative feasibility, etc.
- (iv) CWC also reserves the right to allot the candidate to any centre other than the one he/she has opted for.
- (v) Candidate will appear for the examination at an Examination Centre at their own risk and expenses and CWC will not be responsible for any injury or losses etc. of any nature.
- (vi) Any unruly behaviour/ misbehaviour in the examination hall may result in cancellation of candidature/ disqualification from future exams conducted by CWC.

**V. CUT OFF SCORE (Approval)**

Name of the post	Maximum ratio in order of merit for Interview/ Document Verification
Assistant Engineer (Civil/ Electrical), Accountant, Superintendent (General)	1:5
Junior Technical Assistant	1:3

Each candidate will be required to obtain a minimum score in **each section** of Online examination and also a minimum total score to be considered to be shortlisted for interview/ document verification. **Minimum score to qualify the Professional Knowledge Section in the Online Examination for the posts of Assistant Engineer (Civil), Assistant Engineer (Electrical), Accountant, Junior Technical Assistant, Junior Technical Assistant (SRD-NE) and Junior Technical Assistant (SRD-UT of Ladakh) [Post Code 01, 02, 03, 05, 07 & 08] is fixed at**