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)

i. Engineering Mechanics
ii. Strength of Material
iii. Structural Analysis
iv. Engineering Material (other than concrete and steel)
v. Concrete Structures, Design & IS Codes
vi. Steel Structures, Design & IS Codes

B. Geotechnical Engineering & Geomatics Engineering (20 marks)

i. Soil Mechanics
ii. Foundation Engineering
iii. Soil Improvement Techniques

C. Water Resources Engineering (10 marks)

i. Fluid Mechanics
ii. Hydraulics
iii. Hydrology
iv. Irrigation

D. Environmental Engineering (10 marks)

i. Water and Waste Water
ii. Air Pollution
iii. Municipal Solid Wastes
iv. Noise Pollution

E. Transportation Engineering (20 marks)

i. Transportation Infrastructure
ii. Highway Pavements
iii. Traffic Engineering

F. Surveying (10 marks)

i. Principles of surveying
ii. Maps
iii. Distance and angle measurement
iv. Traversing and triangulation survey
v. Horizontal and vertical curves
vi. 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. 8085Microprocessor: 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]

i. **Basic Agriculture (20 marks)** - Crop Production, Animal Husbandry, Plant Protection, Agriculture Extension, Horticulture, Agriculture Economics
ii. **Botany (10 marks)** – Cell Biology: Tissue, Organ & Organ System, Genetics, Plant Classification, Diversity, Ecology, Life Process: Photosynthesis, Respiration, Circulation, Movement etc.
iii. **Zoology (20 marks)** – Insect: Morphology, Physiology, Taxonomy. Organ System, Heredity & Variation, Micro Organisms, Storage & Public Health, Insects & Rodents, Insecticides, Toxicology
iv. **Chemistry (10 marks)** – Chemical bonding, Organic Chemistry, Inorganic Chemistry, Biochemistry
v. **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