ACE Engineering Academy
(Leading institute for ESE/GATE/PSUs)

COAL INDIA

COAL INDIA LIMITED (CIL)

Management Trainees

Online Test Series

CIVIL ENGINEERING

No. of Tests : 6

Full Length Mock Tests	6

All tests will be available till 28th February 2020

TEST SERIES HIGHLIGHTS

- ★ Rank will be given for each test.
- ★ Test wise and overall statistics.
- ★ Comparison with toppers.
- ★ Question wise and test wise time analysis & comparison with toppers on time management.

Full Length Mock Tests

Test No	Mock codes	No. of Questions	Max Marks	Duration	Date of Activation
Test-01	Full Length Mock Test-1 (Paper-I + Paper-II)	200	200	3 hours	10-01-2020
Test-02	Full Length Mock Test-2 (Paper-I + Paper-II)	200	200	3 hours	18-01-2020
Test-03	Full Length Mock Test-3 (Paper-I + Paper-II)	200	200	3 hours	25-01-2020
Test-04	Full Length Mock Test-4 (Paper-I + Paper-II)	200	200	3 hours	01-02-2020
Test-05	Full Length Mock Test-5 (Paper-I + Paper-II)	200	200	3 hours	08-02-2020
Test-06	Full Length Mock Test-6 (Paper-I + Paper-II)	200	200	3 hours	15-02-2020

Note:
The Syllabus considered as per previous Notification of COAL INDIA. ACE Engineering Academy does not take any responsibility for deviations in syllabus in the final Coal India exam. As per Notification of Coal India each question carries '1' mark and there is no negative marks for wrong answer.

Tests will be activated at 6:00 pm on scheduled day

Paper-I_Syllabus

Subject Name	Syllabus
General Knowledge/ awareness	Everyday Science, Scientific Research, Sports, Indian Culture, Indian History, Indian national movement, World & Indian Geography, Natural resources Indian Economy, Indian Polity, Indian C0nstituti0n,Nati0nal & International current affairs, Environment, India's Agriculture, Trade & Commerce, Basic Information technology.
Reasoning	Analogies, similarities and differences, space Visualization, spatial orientation, problem solving, analysis, judgement, decision making, Visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, Word Building statement conclusion, syllogistic reasoning ,puzzle, Venn Diagrams , Space Visualization , Symbolic/Number Classification, Figural Classification etc.
Numerical ability	Number System,decimals,fracti0ns and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra, , Factor, Heights and Distances. AP. & G.P.Series
General English	Error recognition, fill in the blanks (verbs,Prep0siti0n etc.) synonyms, antonyms, spelling/detecting Mis—spelt words, idioms & phrases, one word substitution, sentences structure, Sentence completion, shuffling of sentence parts, shuffling of sentences in a passage, comprehension passage

Paper-II_Syllabus

Subject Name	Syllabus
Engineering Mechanics	System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Friction and its applications; Kinematics of point mass and rigid body; Centre of mass; Euler's equations of motion; Impulse-momentum; Energy methods; Principles of Virtual work.
Solid Mechanics	Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Theories of failures; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, buckling of column, combined and direct bending stresses.
Structural Analysis	Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.
Construction Materials and Management	Construction Materials: Structural steel - composition, material properties and behaviour; Concrete - constituents, mix design, shortterm and long-term properties; Bricks and mortar; Timber; Bitumen. Construction Management: Types of construction projects; Tendering and construction contracts; Rate analysis and standard specifications; Cost estimation; Project planning and network analysis - PERT and CPM.
Concrete Structures	Working stress, Limit state and Ultimate load design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete; Analysis of beam sections at transfer and service loads.
Steel Structures	Working stress and Limit state design concepts; Design of tension and compression members, beams and beam- columns, column bases; Connections - simple and eccentric, beam-column connections, plate girders and trusses; Plastic analysis of beams and frames.
Soil Mechanics	Origin of soils, soil structure and fabric; Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system; Permeability - one dimensional flow, Darcy's law; Seepage through soils - two-dimensional flow, flow nets, uplift pressure, piping; Principle of effective stress, capillarity, seepage force and quicksand condition; Compaction in laboratory and field conditions; Onedimensional consolidation, time rate of consolidation; Mohr's circle, stress paths, effective and total shear strength parameters, characteristics of clays and sand.
Foundation Engineering	Sub-surface investigations - scope, drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Earth pressure theories - Rankine and Coulomb; Stability of slopes - finite and infinite slopes, method of slices and Bishop's method; Stress distribution in soils - Boussinesq's and Westergaard's theories, pressure bulbs; Shallow foundations - Terzaghi's and Meyerhoffls bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations - types of piles, dynamic and 2/4 static formulae, load capacity of piles in sands and clays, pile load test, negative skin friction.
Fluid Mechanics	Properties of fluids, fluid statics; Continuity, momentum, energy and corresponding equations; Potential flow, applications of momentum and energy equations; Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth.
Hydraulics	Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Kinematics of flow, velocity triangles; Basics of hydraulic machines, specific speed of pumps and turbines; Channel Hydraulics - Energydepth relationships, specific energy, critical flow, slope profile, hydraulic jump, uniform flow and gradually varied flow

Subject Name	Syllabus
Hydrology	Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, flood estimation and routing, reservoir capacity, reservoir and channel routing, surface run-off models, ground water hydrology - steady state well hydraulics and aquifers; Application of Darcy's law.
Irrigation	Duty, delta, estimation of evapo-transpiration; Crop water requirements; Design of lined and unlined canals, head works, gravity dams and spillways; Design of weirs on permeable foundation; Types of irrigation systems, irrigation methods; Water logging and drainage; Canal regulatory works, cross-drainage structures, outlets and escapes.
Water and Waste Water	Quality standards, basic unit processes and operations for water treatment. Drinking water standards, water requirements, basic unit operations and unit processes for surface water treatment, distribution of water. Sewage and sewerage treatment, quantity and characteristics of wastewater. Primary, secondary and tertiary treatment of wastewater, effluent discharge standards. Domestic wastewater treatment, quantity of characteristics of domestic wastewater, primary and secondary treatment. Unit operations and unit processes of domestic wastewater, sludge disposal.
Air Pollution , Municipal Solid Wastes & Noise Pollution	Air Pollution: Types of pollutants, their sources and impacts, air pollution meteorology, air pollution control, air quality standards and limits. Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal). Noise Pollution: Impacts of noise, permissible limits of noise pollution, measurement of noise and control of noise pollution.
Transportation Infrastructure	Highway alignment and engineering surveys; Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments; Geometric design of railway track; Airport runway length, taxiway and exit taxiway design.
Highway Pavements	Highway materials - desirable properties and quality control tests; Design of bituminous paving mixes; Design factors for flexible and rigid pavements; Design of flexible pavement using IRC: 37-2012; Design of rigid pavements using IRC: 58- 2011; Distresses in concrete pavements.
Traffic Engineering	Traffic studies on flow, speed, travel time - delay and 0-D study, PCU, peak hour factor, parking study, accident study and analysis, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Control devices, signal design by Webster's method; Types of intersections and channelization; Highway capacity and level of service of rural highways and urban roads.
Surveying:	Principles of surveying; Errors and their adjustment; Maps - scale, coordinate system; Distance and angle measurement - Levelling and trigonometric levelling; Traversing and triangulation survey; Total station; Horizontal and vertical curves. Photogrammetry - scale, flying height; Remote sensing - basics, platform and sensors, Visual image interpretation; Basics of Geographical information system (GIS) and Geographical Positioning system (GPS).