






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

APPSC-AEE (Mains)

Online Test Series

CIVIL ENGINEERING

Full Length Mock Tests : 9

		No. of Tests
	Paper - 1	3
	Paper - 2	3
	Paper - 3	3

All tests will be available till 30th April 2019

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

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

Test No	Full Length Mock Tests		No. of Questions	Max Marks	Duration	Date of Activation
Test-01	Mock-1	PAPER- I	150	150	2 Hours 30 Min	01-04-2019
Test-02	Mock-1	PAPER- II	150	150	2 Hours 30 Min	02-04-2019
Test-03	Mock-1	PAPER- III	150	150	2 Hours 30 Min	03-04-2019
Test-04	Mock-2	PAPER- I	150	150	2 Hours 30 Min	10-04-2019
Test-05	Mock-2	PAPER- II	150	150	2 Hours 30 Min	11-04-2019
Test-06	Mock-2	PAPER- III	150	150	2 Hours 30 Min	12-04-2019
Test-07	Mock-3	PAPER- I	150	150	2 Hours 30 Min	20-04-2019
Test-08	Mock-3	PAPER- II	150	150	2 Hours 30 Min	21-04-2019
Test-09	Mock-3	PAPER- III	150	150	2 Hours 30 Min	22-04-2019

Note: The Syllabus considered as per Notifications of APPSC. ACE Engineering Academy does not take any responsibility for deviations in syllabus in the final APPSC exam. As per Notification of APPSC each question carries '1' mark and negative marking of 1/3rd (i.e. 0.33 Marks) for each wrong answer.

Syllabus for General Studies & Mental Ability (Paper-1)

Subject Name	Syllabus
GENERAL STUDIES AND MENTAL ABILITY	<ol style="list-style-type: none">1. Events of national and international importance.2. Current affairs - international, national and regional.3. General Science and its applications to the day to day life Contemporary developments in Science & Technology and information Technology4. Social- economic and political history of modern India with emphases on Indian national movement.5. Indian polity and governance: constitutional issues, public policy, reforms and e-governance initiatives.6. Economic development in India since independence.7. Physical geography of India sub-continent.8. Disaster management: vulnerability profile, prevention and mitigation strategies, Application of Remote Sensing and GIS in the assessment of Disaster.9. Sustainable Development and Environmental Protection10. Logical reasoning, analytical ability and data interpretation.11. Data Analysis:<ol style="list-style-type: none">a) Tabulation of datab) Visual representation of datac) Basic data analysis (Summary Statistics such as mean and variance coefficient of variation etc.) and Interpretation12. Bifurcation of Andhra Pradesh and its Administrative, Economic, Social, Cultural, Political, and legal implications/problems.

Syllabus for Civil Engineering (Paper-2)

Subject Name	Syllabus
Strength of Material	<p>Forces, moments, Equilibrium; Applying the Equation of Equilibrium, Planar Trusses; Friction; Simple Stresses & Strains: Elasticity and plasticity, Types of stresses & strains, Generalized Hooke's law – Stress–strain diagram for mild steel – Working stress –Factor of safety – Lateral strain, Poisson's ratio & volumetric strain – Elastic moduli & the relationship between them – Bars of varying section – composite bars –Temperature stresses. Strain energy – Resilience – Gradual, sudden, impact and shock loadings. Shear Force (S.F) and Bending Moment (B.M): Definition of beam –Types of beams – Concept of shear force and bending moment – S.F and B.M for cantilever, simply supported and overhanging beams subjected to point loads, U.D.L., uniformly varying loads and combination of these loads – Point of contra flexure –Relation between S.F., B.M and rate of loading at a section of a beam.</p> <p>Flexural Stresses: Theory of simple bending - Assumptions – bending equation: Neutral axis – bending stresses – section modulus of different sections – Design of simple beam sections. Shear Stresses: Derivation of formula –Shear stress distribution across various beam sections Principal Stresses and Strains: Stresses on an inclined section of a bar under axial loading – Compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear –Mohr's circle of stresses –Principal stresses and strains – Analytical and graphical solutions. Different theories of Failure: Various theories of failure. Columns and struts – Euler's column theory – types of end conditions; critical load on the column - derivations – Rankin's formula for columns. Lifting machines, definitions, Law of machine, study of important lifting machines; virtual work principal.</p> <p>Torsion of Circular Shafts: Theory of pure torsion – Torsion Equations: Assumptions made in the theory of pure torsion – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts – Combined bending and torsion and end thrust. Springs-Helical and leaf springs.</p> <p>Thin & Thick Cylinders and Spherical shells: Thin seamless shells – formula for longitudinal and circumferential stresses and max shear stresses – hoop, longitudinal and volumetric strains – changes in diameter, and volume of thin shells.</p>

Subject Name**Syllabus****Fluid Mechanic and Machinery**

Fluid statics: Dimensions and units: physical properties of fluids-specific gravity, viscosity, and surface tension -vapour pressure and their influence on fluid motion-atmospheric, Pascal's law, gauge and vacuum pressures – Measurement of pressure-Piezometer, U-tube and differential manometers..Hydrostatics, Fluid forces on planes and curved surfaces, submerged and floating bodies, Buoyancy and stability. Fluid kinematics: description of flow pattern and types of fluid flows – Velocity and acceleration: convective, temporal, tangential and normal accelerations, control volume-basic principles of fluid flow, continuity equation for 3-D, 2-D, 1- D flow. Rotational and irrotational motion, Velocity potential, stream function, flow net. Fluid dynamics: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line and its applications, momentum equation and its applications. Flow measurement devices – Gross measurement: Venturimeter, Orificemeter, Turbine flow meters, Rotameters; Pressure measurement: Pitot tubes, hot wire/film anemometer, their measurement principles and sources of errors; calibration.

Closed conduit flow: Reynolds experiment - Major and Minor losses in pipes-pipes in series and pipes in parallel-total energy line-hydraulic gradient line, water hammer. Boundary Layer Concepts: Definition, thicknesses, characteristics along thin plate, laminar and turbulent boundary layers boundary layer in transition, separation of boundary layer, submerged objects – Drag and lift.

Basics of turbo machinery: Hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, velocity diagrams, work done and efficiency, Hydraulic Turbines: Classification of turbines, Heads and efficiencies, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine - working proportions, work done, efficiencies , hydraulic design – Draft tube theory-functions and efficiency. Performance of hydraulic turbines: Geometric similarity, Unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine, cavitation. Centrifugal pumps: Classification, working, work done – barometric head-loss and efficiencies, specific speed - Performance characteristic curves, NPSH. Selection of pumps and economic evaluation of pumping.

Hydraulic Directional Control – Check Valves, Shuttle Valves, two- three- and four-Way Directional Control Valves, Directional Control Valve Actuation. Hydraulic Pressure Control –Pressure Relief Valves, Unloading Valves, Pressure Reducing Valves, Sequence Valves, Counterbalance Valves, Pressure Compensated Pumps.

Hydro Projects And Plant: Classification – Typical layouts – plant auxiliaries – plant operation, pumped storage plants. Hydro Electric Power Plant: Water power – Hydrological cycle / flow measurement – drainage area characteristics – Hydrographs – Storage and Pondage – Classification of dams and spill ways.

Syllabus for Civil Engineering (Paper-3)

Subject Name	Syllabus
BUILDING MATERIALS	<p>Timber: Different types and species of structural timber, density – moisture relationship, strength in different directions, defects, preservations, and plywood.</p> <p>Bricks: Types, Indian standard classification, absorption, saturation factor, strength in masonry, influence of mortar strength on masonry strength.</p> <p>Cement: Compounds of different types, setting times, strength.</p> <p>Cement mortar: Ingredients, proportions, water demand, mortars for plastering and masonry.</p> <p>Concrete: Importance of w/c ratio, strength, ingredients including admixtures, workability, testing for strength, mix design methods, non-destructive testing.</p>
STRUCTURAL ANALYSIS	<p>General theorems: theorems relating to elastic structures, principles of virtual work, strain energy in elastic structures, complementary energy, Castigliano's theorem, Betti's and Maxwell's reciprocal theorems.</p> <p>Analysis of determinate structures – Deflection of determinate beams by double integration Macaulay's moment area and conjugate beam methods, Analysis of indeterminate skeletal frames-Moment distribution, Slope deflection, Kani's, Stiffness and force methods, Energy methods, Plastic analysis of indeterminate beams and simple portal frames..</p>
DESIGN OF STEEL STRUCTURES	<p>Principles of limit state method. Plastic sections, Design of bolted and welded connections, Design of tension, compression members and beams, axially and eccentrically loaded joints, Simple connection of bracket plates to columns, beam to beam and beam to column connections, design of framed, un-stiffened and stiffened seat connections. Design of industrial roofs. Principles of ultimate load design. Design of simple members.</p>
DESIGN OF CONCRETE AND MASONRY STRUCTURES	<p>Limit state design for bending, Shear, Axial compression and combined forces. Codal provision for slabs, Beams, Columns and footings. Principles of pre-stressed concrete design, Materials, Methods of pre-stressing, losses. Design of simple members and determinate structures. Design of brick masonry as per IS codes.</p>
CONSTRUCTION PLANNING AND MANAGEMENT	<p>Bar chart, Linked bar chart, Work break down structures, Activity – on – arrow diagrams. Critical path, Probabilistic activity durations, Event based networks. PERT network: Time-cost study, Crashing, Resource allocation.</p>

Subject Name	Syllabus
<p>HYDRAUICS, AND WATER RESOURCE ENGINEERING</p>	<p>Open Channel flow : types of flows - Type of channels – Velocity distribution – Energy and momentum correction factors, uniform flow and calculation of uniform flow, most economical section, Specific energy, critical flow conditions, critical depth computation, Non-Uniform flow: Assumptions and Equation for Gradually varied flow, types of channel bottom slopes, classification of surface profiles. Rapidly varied flow, hydraulic jump, energy dissipation. Hydraulic Similitude: Dimensional analysis-Rayleigh’s method and Buckingham’s pi theorem- –Geometric, kinematic and dynamic similarities - dimensionless numbers – model and prototype relations. Distorted and non-distorted models.</p> <p>Hydrological cycle and its components, Precipitation and related data analysis, Evaporation and transpiration; S-hydrograph, Unit hydrographs. Floods and their management, Probable maximum Flood; Streams and their gauging; Routing of floods; Capacity of reservoirs. Multipurpose uses of water; Soil-Plant-Water relationships, Irrigation systems, Water demand assessment; Storages and their yields, Ground water yield and well Hydraulics; Water logging, drainage design. Design of rigid boundary canals, Lacey’s and tractive force concepts in canal design, Lining of Canals, Sediment transport in canals, Non-overflow and overflow section of gravity dams and their design, Energy dissipaters, tail water rating; Design of head works, Distribution works, Falls, Cross-drainage works, Outlets, River training.</p>
<p>ENVIRONMENTAL ENGINEERING</p>	<p>Water Supplying Engineering: Sources of supply, Yields, Design of intakes and conductors, Estimation of demand. Water quality standards, Control of water borne diseases. Primary and secondary treatment. Conveyance and distribution systems of treated water, Leakages and control. Rural water supply. Institutional and industrial water supply.</p> <p>Waste Water engineering: Urban rain water disposal, Systems of sewage collection and disposal. Design of sewers and sewerage systems, Pumping. Characteristics of sewage and its treatment. Disposal of products of sewage treatment. Plumbing systems. Rural and semiurban sanitation.</p> <p>Solid Waste Management: Sources and effects of air pollution, Monitoring of air pollution, Noise pollution, Standards, Ecological chain and balance. Environmental impact assessment.</p>
<p>SOIL MECHANICS AND FOUNDATION ENGINEERING</p>	<p>Properties and classification of soil, Compaction, Permeability and Seepage, Flow nets, Compressibility and consolidation. Stress distribution in soils, Shearing resistance, Stresses and failure. Soil testing in laboratories and insitu, Earth pressure theories, Soil exploration. Types of foundations, Selection criteria, bearing capacity, Settlement, laboratory and field tests, Design of shallow foundations. Types of piles and their design and layout. Foundations on expansive soils.</p>

Subject Name**Syllabus****SURVEYING AND
TRANSPORT
ENGINEERING**

Classification of surveys, Scales, Accuracy, Measurement of distances, Direct and indirect methods, Optical and electronic devices, Measurement of directions, Prismatic compass, Local attraction, Theodolites, Types, Measurement of elevations, Spirit and trigonometric leveling, Contours, Digital elevation modeling concept, Establishment of control by triangulations and traversing, Measurement and adjustment of observations, Computation of coordinates, Field astronomy, Concept of global positioning system, Map preparation by plane tabling and by photogrammetry, Remote sensing concepts, Map substitutes.

Planning of Highway systems, Alignment and geometric design, Horizontal and vertical curves, Grade separation, Highway Materials and construction methods for different surfaces and maintenance. Principles of pavement design, Drainage. Traffic surveys, Intersections, Signaling, Mass transit systems, Accessibility, Networking.