ACE®
Engineering Publications
(A Sister concern of ACE Engineering Academy, Hyderabad)

ESE - 2027

UPSC Preliminary Examination

MORE THAN 35 YEARS OF SOLUTIONS 1991-2026

CIVIL ENGINEERING

OBJECTIVE VOLUME - II

Previous Years Objective Questions with Solutions,
Subjectwise & Chapterwise

Published at:

ACE Engineering Publications

#3rd Floor, Suryalok Complex, Rosary Convent School Road,
Gunfoundary, Basheer Bagh, Hyderabad – 500001,
Telangana, India.
Phone: 7799996602
Website: aceengineeringpublications.com
Email: aceenggpublications@aceenggacademy.com
help@ace.online

Authors:

Subject experts of ACE Engineering Academy, Hyderabad

1st Edition : 2011
16th Edition : 2026

Printed at:
Karshak Art Printers,
Hyderabad.

MRP : ₹.1150/-
ISBN : 978-1-64597-372-0

Foreword

The Stage-I (Prelims) of ESE consists of two objective papers. Paper-I is of General Studies & Engineering Aptitude. Paper-II is of Civil Engineering of 300 Marks and 3 hours duration.
In stage-II (Mains), the technical syllabus is divided into two papers. The subjects included in this volume are:

1. Fluid Mechanics & Hydraulic Machines
2. Hydrology
3. Irrigation Engineering
4. Environmental Engineering
5. Geotechnical Engineering
6. Surveying
7. Geology
8. Transportation Engineering

Keeping in view of the above topics, the present Volume-II for prelims of new pattern is redesigned using the previous questions from 1992 onwards.

The style, quality and content of the Solutions for previous ESE Questions of Civil Engineering, will encourage the reader, especially the student whether above average, average or below average to learn the concept and answer the question in the subject without any tension. However it is the reader who should confirm this and any comments and suggestions would be pleasantly received by the Academy.

It is observed that majority of ESE objective Questions are being asked as it is in many PSUs, state service commission, state electricity boards and even in GATE exam. Hence we strongly recommend all students who are competing for various competitive exams to use this book according to the syllabus of the exam concerned. This book can also be used by fresh Teachers in engineering colleges to improve their Concepts.

We proudly say that questions and solutions right from 1992 onwards are given in this book. The questions which appeared early 90's are most conceptual oriented and these are being repeated in the recent exams in a different way. Hence we advise the students to practice these questions compulsorily. The student is also advised to analyze why only a particular option is correct and why not others. Evaluate yourself, in which case, these other options are correct. With this approach you yourself can develop four questions out of one question.

The student is advised to solve the problems without referring to the solutions. The student has to analyze the given question carefully, identify the concept on which the question is framed, recall the relevant equations, find out the desired answer, verify the answer with the final key such as (a), (b), (c), (d), then go through the hints to clarify his/her answer. The student is advised to have a standard text book ready for reference to strengthen the related concepts, if necessary. The student is advised not to write the solution steps in the space around the question. By doing so, he loses an opportunity of effective revision.

With best wishes to all those who wish to go through the following pages.

Y.V. Gopala Krishna Murthy,
M Tech. MIE,
Chairman & Managing Director,
ACE Engineering Academy,
ACE Engineering Publications,
Frost Interactive Service Pvt. Ltd. (ACE ONLINE).

Syllabus for Civil Engineering (CE)

Fluid Mechanics, Open Channel Flow, Pipe Flow:
Fluid properties; Dimensional Analysis and Modeling; Fluid dynamics including flow kinematics and measurements; Flow net; Viscosity, Boundary layer and control, Drag, Lift, Principles in open channel flow, Flow controls. Hydraulic jump; Surges; Pipe networks.

Hydraulic Machines and Hydro power:
Various pumps, Air vessels, Hydraulic turbines – types, classifications & performance parameters; Power house – classification and layout, storage, pondage, control of supply.

Hydrology:
Hydrological cycle, Ground water hydrology, Well hydrology and related data analysis; Streams and their gauging; River morphology; Flood, drought and their management; Capacity of Reservoirs.

Irrigation:
Multipurpose uses of Water, River basins and their potential; Irrigation systems, water demand assessment; Resources - storages and their yields; Water logging, canal and drainage design, Gravity dams, falls, weirs, Energy dissipaters, barrage Distribution works, Cross drainage works and head-works and their design; Concepts in canal design, construction & maintenance; River training, measurement and analysis of rainfall.

Environmental Engineering:
(a) Water Supply Engineering:
Sources, Estimation, quality standards and testing of water and their treatment; Rural, Institutional and industrial water supply; Physical, chemical and biological characteristics and sources of water, Pollutants in water and its effects, Estimation of water demand; Drinking water Standards, Water Treatment Plants, Water distribution networks.

(b) Waste Water Engineering:
Planning & design of domestic waste water, sewage collection and disposal; Plumbing Systems. Components and layout of sewerage system; Planning & design of Domestic Waste-water disposal system; Sludge management including treatment, disposal and re-use of treated effluents; Industrial waste waters and Effluent Treatment Plants including institutional and industrial sewage management.

(c) Solid Waste Management:
Sources & classification of solid wastes along with planning & design of its management system; Disposal system, Beneficial aspects of wastes and Utilization by Civil Engineers.

(d) Air, Noise pollution and Ecology:
Concepts & general methodology.

Geo-technical Engineering:
Soil exploration - planning & methods, Properties of soil, classification, various tests and inter-relationships; Permeability & Seepage, Compressibility, consolidation and Shearing resistance, Earth pressure theories and stress distribution in soil; Properties and uses of geo-synthetics.

Foundation Engineering:
Types of foundations & selection criteria, bearing capacity, settlement analysis, design and testing of shallow & deep foundations; Slope stability analysis, Earthen embankments, Dams and Earth retaining structures: types, analysis and design, Principles of ground modifications.

Surveying:
Classification of surveys, various methodologies, instruments & analysis of measurement of distances, elevation and directions; Field astronomy, Global Positioning System; Map preparation; Photogrammetry; Remote sensing concepts; Survey Layout for culverts, canals, bridges, road/railway alignment and buildings, Setting out of Curves.

Geology:
Basic knowledge of Engineering geology & its application in projects.

Highways Engineering:
Planning & construction methodology, Alignment and geometric design; Traffic Surveys and Controls; Principles of Flexible and Rigid pavements design.

Railways Engineering:
Terminology, Planning, designs and maintenance practices; track modernization

Airports: Layout, planning & design.
Harbours:– Terminology, layouts and planning.
Tunneling: Alignment, methods of construction, disposal of muck, drainage, lighting and ventilation.

Weightage of Subjects in Engineering Services Examination (2021 – 2026)

S.No.	Name of the Subject	2021	2022	2023	2024	2025	2026
01	Building Materials	13	11	16	16	11	12
02	Solid Mechanics	15	18	20	20	22	24
03	Structural Analysis	05	09	06	04	01	0
04	Design of Steel structures	13	11	12	12	10	12
05	Design of Concrete & Masonry Structures	15	15	11	11	10	13
06	Construction Practice, Planning & Management	13	12	12	10	13	13
07	Fluid Mechanics & Hydraulic Machines	13	13	14	13	14	13
08	Engineering Hydrology	04	04	01	08	02	08
09	Irrigation Engineering	10	08	12	05	12	04
10	Environmental Engineering	11	11	10	14	14	13
11	Geotechnical Engineering	12	13	14	12	17	12
12	Surveying	13	13	09	11	08	11
13	Geology	01	01	01	01	01	01
14	Transportation Engineering (Highways, Railways, Airports, Harbours & Tunnels)	12	11	12	13	15	14
Total No. of Questions		**150**	**150**	**150**	**150**	**150**	**150**

CONTENTS

Name of the Subject