

ADVANCED STRUCTURAL DESIGN

Paper Code: ETCE-310

Paper: Advanced Structural Design

L	T/P	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:

Maximum Marks: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Objective: Develop professional level competence in the seismic design and detailing of concrete and steel structures, structural elements as well as design of commonly used prestressed concrete structures.

UNIT I

Introduction to Seismic design: General principles of seismic design, Introduction to IS 1893 : 2002, Building equivalent static analysis, Vertical distribution of seismic forces and horizontal shears, dynamic analysis, design spectrum, Seismic weights, Modal combination, Load combinations and permissible stresses, Guidelines for earthquake resistant design, Ductile detailing for seismic design, Analysis for lateral Loads: Introduction to IS 875 Part-III.

[T1][No. of Hours: 12]

UNIT II

Concrete structure design: Design of elevated and underground water tanks as per IS: 3370 and IS: 1893 Part-V. Design of retaining walls, Design of Box culvert.

[T2][No. of Hours: 12]

UNIT III

Prestressed concrete: Need for prestressing, pre tensioning and post tensioning methods, Concept of load balancing and cable profile, End anchorage, losses of prestress, Design of pre-stressed concrete beams as per IS: 1343.

[T1,T2][No. of Hours: 10]

UNIT IV

Steel structural design: Design of elevated water tanks, Design of transmission and communication towers and design of gantry girder as per IS: 800.

[T1,T2][No. of Hours: 10]

Text Books:

- [T1] N. Krishna Raju, R.N.Pranesh, "Reinforced concrete Design", CBS Publishers
[T2] P.C.Verghese, "Advance Reinforced concrete Design" PHI Delhi

References:

- [R1] N. Krishna Raju, "Prestressed concrete", Tata McGraw Hill.
[R2] Arther H. Nilson, "Design of concrete structures", Tata McGraw Hill
[R3] Arya and Ajamani, "Design of steel structures", Nem Chand and Bros. Publishers
[R4] C. Syal and A.K. Goel, "Reinforced concrete structures", S. Chand.
[R5] Prestressed concrete, Pandit and Gupta, CBS
[R6] T.Y. Lin, Design of Prestressed Concrete Structures, Asia Publishing House, 1955.
[R7] Edward Nawy, Prestressed Concrete: A fundamental approach, prentice hall, New Jersey
[R8] BIS 1893 – 2002 and BIS 875 Part III
[R9] N.Krishna Raju, "Advance Reinforced concrete Design" CBS Publishers