

B. Tech Civil Engineering (Semester – 3rd)
INTRODUCTION TO CIVIL ENGINEERING
Subject Code: BHSMC0-021
Paper ID: [18110717]

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:

- a. What are the major disciplines within civil engineering, and how do they contribute to various aspects of infrastructure development?
- b. What role did civil engineering play in the construction of transportation networks such as railways and highways during the 19th and 20th centuries?
- c. How do governments allocate budgets for infrastructure works, and what criteria are typically considered in this process?
- d. What are some common types of deep foundation systems used in geotechnical engineering?
- e. What are the key considerations in designing irrigation systems for agricultural use?
- f. Differentiate between Plain, Reinforced & Prestressed Concrete.
- g. What is GPS (Global Positioning System), and how does it work to determine accurate positions on the Earth's surface?
- h. What are the fundamental principles underlying corrosion phenomena and other structural distress mechanisms?
- i. Differentiate between carbon fiber wrapping and carbon composites in structural repairs.
- j. Write a short note on Smart City projects of Government of India

Section – B **(5 marks each)**

- Q2. How does aesthetics play a role in civil engineering projects, and what are fundamentals of architectural design & town planning?
- Q3. How are automation and robotics transforming the construction industry? Explain with examples of their applications in various tasks like site preparation, material handling, and assembly?
- Q4. What are the factors that affect the fluid flow? What is the difference between Newtonian fluid and non-newtonian fluid?
- Q5. What strategies and technologies are employed to address road safety concerns in India, particularly under conditions of heterogeneous traffic and diverse road users?
- Q6. Discuss the importance of quality and Health, Safety, and Environment (HSE) systems in construction projects, and how do they contribute to the successful delivery of projects while ensuring the well-being of workers and the environment?

Section – C**(10 marks each)**

- Q7. What are the key characteristics and properties of traditional building materials such as stones, bricks, and mortars, and how have they been utilized in construction throughout history?
- Q8. Explain the role of Computational Fluid Dynamics (CFD) software in civil engineering, and how is it applied to analyze fluid flow and heat transfer in various engineering systems.
- Q9. Discuss the principles and benefits of Building Information Modeling (BIM) software in civil engineering projects, and how does it facilitate collaboration and coordination among project stakeholders?