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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 Newtonion fluid and non-newtonion 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?