

Register No: .....

Name: .....

**SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**EIGHTH SEMESTER B.TECH. DEGREE EXAMINATION(R), MAY 2024****Civil Engineering****(2020 SCHEME)****Course Code : 20CET456****Course Name : Sustainable Construction****Max. Marks : 100****Duration:3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. Define sustainable construction and state its goals.
2. Summarize the evolution of EIA in India.
3. Discuss the environmental advantages of using eco blocks over conventional building materials.
4. Discuss the advantages of biomaterials in construction.
5. Describe the Rat Trap Bond technique in wall construction. How does it contribute to thermal insulation and energy efficiency in buildings?
6. Enlist the common applications of steel in building construction.
7. Define LEED and describe its criteria for assessing buildings.
8. List any three commercial building that has achieved green building certification.
9. List the benefits of implementing BIM in construction projects.
10. Describe how building automation enables remote monitoring and management of building systems.

**PART B***(Answer one full question from each module, each question carries 14 marks)***MODULE I**

11. a) Define the goals of sustainability analysis. 4
- b) Illustrate the steps of Life Cycle Analysis with the help of an example. 10

**OR**

12. a) Compare and contrast embodied energy and embodied carbon. 8
- b) Outline the strategies to reduce embodied energy and embodied carbon. 6

**MODULE II**

13. a) List out the various non-governmental organisations involved in the development of alternative building materials. 4
- b) Describe the alternative building materials promoted by TERI and DA. 10

**OR**

14. a) Discuss the criteria for the selection of sustainable construction materials. 4
- b) Describe the social, economical and environmental benefits of a sustainable building. 10

**MODULE III**

15. a) Compare and contrast ferro-cement and ferro-concrete in terms of their structural properties and applications in construction. 8  
b) Discuss the environmental impact of using ferro-cement and ferro-concrete in building construction, considering factors such as energy consumption and material usage. 6

**OR**

16. Discuss the mission and objectives of Nirmithi Kendra in promoting sustainable construction practices and indigenous building technologies. Summarise the impact of its initiatives on local communities and the construction industry. 14

**MODULE IV**

17. Discuss the relationship between the NBC and green building rating systems in India. Explain how they complement each other in promoting sustainable building practices and ensuring building safety and resilience. 14

**OR**

18. a) Discuss the importance of diversifying renewable energy sources in buildings to enhance energy resilience and reduce reliance on fossil fuels. 6  
b) Discuss the use of ground-source heat pumps and geothermal wells, for heating, cooling, and hot water production in buildings. 8

**MODULE V**

19. a) Discuss the challenges and limitations associated with implementing BIM for cost estimation. 6  
b) Describe how BIM-integrated construction management platforms improve coordination, communication, and efficiency on-site. 8

**OR**

20. a) Describe the benefits and objectives of implementing building automation in commercial and residential buildings. 6  
b) Discuss the role of building automation in energy management and sustainability initiatives and explain how BA systems optimize energy consumption, monitor renewable energy sources, and support green building certifications. 8

\*\*\*\*\*