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**Question Paper Code : 71090**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Seventh / Ninth Semester

Civil Engineering

OEN 751 – GREEN BUILDING DESIGN

(Common to Aeronautical Engineering / Aerospace Engineering / Agriculture Engineering / Automobile Engineering / Biomedical Engineering / Computer Science and Engineering / Computer and Communication Engineering / Electronics and Communication Engineering / Electronics and Telecommunication Engineering / Geoinformatics Engineering / Industrial Engineering / Industrial Engineering and Management / Manufacturing Engineering / Marine Engineering / Material Science and Engineering / Mechanical Engineering / Mechanical Engineering (sandwich) / Mechanical and Automation Engineering / Mechatronics Engineering / Medical Electronics / Petrochemical Engineering / Production Engineering / Robotics and Automation / Safety and Fire Engineering / Artificial Intelligence and Data Science / Bio Technology / Chemical Engineering / Chemical and Electrochemical Engineering / Computer Science and Business Systems / Fashion Technology/ Food Technology / Handloom and Textile Technology / Information Technology / Petrochemical Technology / Petroleum Engineering / Pharmaceutical Technology / Textile Chemistry / Textile Technology)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define embodied energy.
2. List any two features of green building.
3. Give two examples of biomass resources for building.
4. List any two alternative concepts for sustainable building materials.
5. Define thermal comfort.
6. What is heat transfer in the building?

7. List any two solar technologies used in buildings for energy generation.
8. State evaporative cooling.
9. What is sullage water and how does it differ from sewage?
10. What is meant by "green cover" in the context of the built environment?

PART B — (5 × 13 = 65 marks)

11. (a) Describe the environmental implications of using materials with high embodied energy in building construction. Provide examples of such materials.

Or

- (b) Discuss the advantages and challenges of adopting renewable energy sources, such as solar panels in reducing carbon emissions buildings.

12. (a) Explain the concept of "cradle-to-cradle" design and how it encourages the use of recyclable and renewable building materials.

Or

- (b) Discuss the potential of biomass resource materials for reducing ecological footprint.

13. (a) Explain the role of insulation materials in reducing heat transfer through building envelopes and their impact on energy efficiency.

Or

- (b) Describe the variation in solar heat incidence of buildings in different geographical locations.

14. (a) Summarize the energy-saving benefits of incorporating solar passive heating in building designs.

Or

- (b) Explain the role of the below-given ventilation types with respect to low-energy cooling design .

(i) Natural ventilation. (4)

(ii) Cross ventilation. (4)

(iii) Stack effect. (5)

15. (a) Describe the green composites are and how they differ from conventional composite materials.

Or

- (b) Discuss the economic and environmental benefits of reducing water consumption in buildings.

PART C — (1 × 15 = 15 marks)

16. (a) Illustrate the differences between solar passive heating and cooling techniques in terms components and operation.

Or

- (b) Examine a case study of a building that successfully addresses thermal comfort issues through innovative design and technologies.