

**Reg. No. :** \_\_\_\_\_

# **Question Paper Code : R 51228**

**B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.**

## Fourth Semester

## Civil Engineering

GE 3451 – ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

(Common to all branches (Except Environmental Engineering))

(Regulations 2021)

(Also common to PTGE 3451 – Environmental Sciences and Sustainability for  
B.E.(Part-Time) First Semester – Electrical and Electronics Engineering /  
Electronics and Communication Engineering – Regulations – 2023)

**Time : Three hours**      **Maximum : 100 marks**

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**Answer ALL questions.**

**PART A — (10 × 2 = 20 marks)**

1. Define ecosystem.
  2. Mention any two threats to biodiversity.
  3. What is soil pollution?
  4. Give any two methods for solid waste management.
  5. Mention any two applications of hydrogen energy.
  6. Give two ways for energy conservation.
  7. Define carbon footprint.
  8. Mention any two sustainability goals.
  9. What is environmental impact assessment?
  10. Define energy efficiency.

**PART B — (5 × 13 = 65 marks)**

11. (a) Ecosystem is dynamic in nature where even a bare land can turn into a forest. Justify by explaining the steps involved in the succession of a lifeless bare land into self-dependent forest ecosystem. Support your answer with an example mentioning the different steps clearly.

Or

- (b) Biodiversity is a precious gift which needs to be conserved. Justify the statement by explaining any three important values of biodiversity and two methods of conservation of biodiversity.

12. (a) Air and water are essential natural resources required for our survival which are getting increasingly polluted. Explain any two causes, effects and control measures at source for each of them.

Or

- (b) Briefly discuss any two methods for hazardous waste management. Discuss the salient features, drawbacks and amendments of the acts for protecting wildlife and forests.

13. (a) Energy demand increases with population. Explain the principle and various steps involved in energy management and conservation that can lead to sustainability.

Or

- (b) The internal thermal energy of earth can be used to generate electrical energy. Justify by explaining the various types of geothermal power plants. Bring out any two advantages and disadvantages of geothermal energy.

14. (a) Explain how GDP can be modified into an indicator for sustainability. Mention any three ways to make a transition from unsustainability to sustainability. Describe the target, indicators and intervention areas of any four sustainable development goals.

Or

- (b) With the help of case studies, explain any two regional environmental issues with possible solutions. Bring out the differences between carbon footprint and carbon credit.

15. (a) Explain how zero waste, 'R' concept and circular economy are related to each other. Describe the importance of ISO14000 series with two examples. Briefly describe the steps involved in environmental impact assessment.

Or

- (b) Discuss the carbon cycle with a neat diagram. As CO<sub>2</sub> in the atmosphere cause global warming, it has to be sequestered. Explain the different ways of carbon sequestration. Mention any three ways for sustainable urbanization.

PART C — (1 × 15 = 15 marks)

16. (a) A construction company has to take care of the safety of its employees along with providing a healthy environment to work. Describe any two safety and health issues which the company has to address. Suggest the steps involved in ensuring a safe and healthy work place along with a case study.

Or

- (b) Green buildings are essential for environmental sustainability. Justify by giving any five key features of green buildings. Industries have a big role to play in achieving environmental sustainability. Explain environmental management in industries with a detailed case study.
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