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Question Paper Code : R 81511

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2025.

Fourth Semester

Civil Engineering

GE3451 — ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

(Common to : Aeronautical Engineering/Aerospace Engineering/
Automobile Engineering/Biomedical Engineering/Computer Science and Design/
Computer Science and Engineering/Computer Science and Engineering (Artificial
Intelligence and Machine Learning)/Computer Science and Engineering (Cyber
Security)/Computer and Communication Engineering/Electrical and Electronics
Engineering/Electronics and Communication Engineering/Electronics and
Instrumentation Engineering/Electronics and Telecommunication Engineering/
Geoinformatics Engineering/Industrial Engineering/Industrial Engineering and
Management/Instrumentation and Control Engineering/Manufacturing
Engineering/Marine Engineering/Materials 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/Agricultural Engineering/Artificial Intelligence and Data Science/Bio
Technology/Biotechnology and Biochemical Engineering/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/Plastic Technology/Textile Chemistry/
Textile Technology)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is ecosystem?
2. Define energy flow.

3. Provide four sources of air pollution.
4. What are the permissible limits of noise in industrial and residential areas?
5. Enlist the types of hydrogen for energy application.
6. What is energy management and conservation?
7. Define GDP.
8. Provide any four millennium development goals.
9. What is called 3R concept?
10. Define circular economy.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss in detail about ecological succession with an example of particular ecosystem.

Or

- (b) Explain in detail about biodiversity and discuss about various threads to biodiversity.

12. (a) Discuss about causes, effects and control measures of water pollution.

Or

- (b) Discuss about occupational health and safety management system with a case study.

13. (a) Explain in detail about ocean energy resources and Tidal energy conversion.

Or

- (b) Discuss in detail about the concept, origin and power plants of geothermal energy.

14. (a) Explain how the millennium development goals formulated to convert unsustainability to sustainability.

Or

- (b) Discuss in detail about the concept of carbon credit and carbon footprint.

15. (a) Explain in detail about green buildings and green materials.

Or

- (b) Discuss in detail about carbon cycle, emission and sequestration.

PART C — (1 × 15 = 15 marks)

16. (a) Analyze the environmental management in industry with a case study.

Or

- (b) Analyze the impact of green engineering on sustainable urbanization, socio-economic and technological change.
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