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(An Autonomous Institution, Affiliated to Anna University, Chennai)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

IV- Semester

GE3451 – ENVIRONMENTAL SCIENCE AND SUSTAINABILITY

(Regulations 2021)

	UNIT-I (ENVIRONMENTAL AND BIODIVERSITY) PART - A
1.	Define – Environmental Engineering.
2.	List the types of environment.
3.	What is an Abiotic component?
4.	What are biotic components?
5.	List the scope of environmental studies?
6.	What is the significance of environmental studies?
7.	What is ecology?
8.	What is an ecosystem?
9.	List the types of ecosystem?
10.	Draw the structure of ecosystem
11	What are the functions of ecosystem?
12	Define the first law of thermodynamics in terms of environmental studies
13	Define the second law of thermodynamics in terms of environmental studies
14	What is ecological succession?
15	List the process of ecological succession?
16	Define – Biodiversity
17	List the importance of biodiversity
18	What are endemic species of India?
19	What are endangered species of India?

20	How can we conserve the biodiversity?	
	PART-B	
1.	Explain the scope and significance of environmental studies.	(13)
2.	Explain the importance of environmental protection and justify the needs for public awareness.	(13)
3.	What is an ecosystem? Describe the structure and functions of various components of an ecosystem.	(13)
4.	Briefly explain the energy flow through ecosystem.	(13)
5.	Explain the stages in ecological succession using appropriate terminology	(13)
6.	What are the various hot spots of biodiversity in India?	
	PART-C	
1.	Explain in detail about the values of biodiversity.	(15)
2.	Discuss the various strategies for conservation of biodiversity.	(15)
3.	Discuss the status of India as a mega diverse nation of biodiversity	(15)
4.	Explain the various types of biodiversity.	(15)

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	UNIT-II (ENVIRONMENTAL POLLUTION) **PART-A**
1.	Define Pullution
2.	Name any four air pollutants, and their sources and effects.
3.	Give examples for primary and secondary air pollutans.
4.	Write any four major water pollutants.
5.	Give a comprehensive definition for air pollution.
6.	Classify air pollutants with suitable example.
7.	What are the causes of air pollution?
8.	What are the effects of air pollution on plants?
9.	What are the air pollutants?
10.	List the sources of toxic pollutants in water?

11	What are the objectives of wastewater treatment?	
12	List any for water quality parameters and their importance.	
13	Write any two causes of soil pollution.	
14	Define soil pollution.	
15	What do you mean by noise pollution.	
16	Define: Decibel	
17	When a sound causes noise pollution?	
18	Write two effects of noise pollution.	
19	Define hazardous wastes	
20	Define solid waste.	
	PART - B	
1.	Discuss the causes and effects of (i) Air pollution (ii) Water pollution	(13)
2.	Suggest measures to control air pollution.	(13)
3.	Explain the causes, effects and control measure of water pollution.	(13)
4.	Discuss the major causes and effects of soil pollution.	(13)
5.	Discuss the sources and effects of soil pollution.	(13)
6.	Explain the concept of source, effects and control of noise pollution.	(13)
7.	Explain the various types of solid wastes generated in urban areas.	(13)
8.	Discuss about the hazardous waste and its types.	(13)
9.	What is OHASMS? and Discuss the OHASMS procedures	(13)
	PART - C	
1.	Discuss the major sources air pollutants and their impact and methods of controlling air pollution.	(15)
2.	Name and discuss the effects of water pollution. Suggest the various control and remedial measures to water pollution.	(15)
3.	Discuss briefly about the solid waste managment and e-waste managment.	(15)

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	UNIT-III (RENEWABLE SOURCES OF ENERGY) PART -A	
1.	What is energy management.	
2.	What are the objectives of energy management.	
3.	What is energy conservation? How is it achieved.	
4.	What are the objectives of energy conservation.	
5.	What are the problems of using hydrogen as a new energy source.	
6.	What are the sources of hydrogen	
7.	What is the significance of OTE?	
8.	What is the significance of Geo-thermal energy?	
9.	What is solar energy?	
10.	What is Bio-mass energy?	
11	What is the significance of Bio-mass energy?	
12	What is DESS? Mention its components.	
13	What is the important use of artificial intelligence in energy sector?	
14	Write any four applications of hydrogen energy.	
15	How does hydrogen fuel cell works?	
16	Give some important disadvantages of hydrogen fuel cell.	
17	What is tidal energy.	
18	Give any 5 applications of tidal energy conversion.	
19	What are the merits of tidle energy conversion.	
20	What is the difference between geothermal power and geothermal energy.	
	PART - B	
1.	Explain the principle and various steps involved in the energy management.	(13)
2.	What are the objectives, principle and importance of energy consersion?	(13)
3.	Explain the applications of (i) hydrogen energy (ii) ocean energy	(13)

4.	Write notes on advantages and disadvantages of (i) hydrogen energy (ii) ocean energy	(13)
5.	Explain the origin, concept and advantage and disadvantages of GTE.	(13)
6.	Explain the applications and advantages and disadvantages of GTE.	(13)
	PART – C	
1.	Write detailed notes on various new energy sources.	(15)
2.	Explain the 15 ways to conserve energy.	(15)
3.	What is meant by GTE and explain various types of GTE	(15)

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	UNIT-IV (SUSTAINABILITY AND MANAGEMENT) **PART A**
1.	What is development?
2.	What are the characteristics of development?
3.	Mention some disadvantages of development.
4.	Write short note on types of GDP?
5.	What is GDP?
6.	How will you calculate GDP?
7.	Define Sustainability
8.	Write any important need of sustainability.
9.	Define sustainable development.
10.	Write any 5 intervention areas of sustainable development goals.
11	What is climate change?
12	What are the causes of climate change?
13	Mention any 5 effects of climate change.
14	Define carbon credit.
15	Write any 3 advantages of carbon credits.

16	What are the types of carbon credits?	
17	Define carbon footprint.	
18	What are the sources of carbon footprint?	
19	What are the causes of carbon footprint?	
20	What is environmental management?	
	PART - B	
1.	Explain the principle, types, characteristics and steps of development.	(13)
2.	Define Sustainability? Explain the economic and social challenges of sustainability.	(13)
3.	Explain the various aspects and relationship of sustainability.	(13)
4.	Write notes on concept, goal and aim of sustainable development.	(13)
5.	Write notes on (i) Millennium Development Goals. (ii) Sustainability protocols.	(13)
6.	What are the causes, effects and possible solutions of climate change?	(13)
7.	What is meant by carbon credit? Explain its types and merits.	(13)
8.	Explain the objectives and principles of environmental management.	(13)
	PART - C	
1.	(i) Explain the causes and characteristics of unsustainability. (ii) Explain the differences between sustainability and unsustainability.	(15)
2.	(i) Explain the sustainable development targets. (ii) Explain the sustainable development indicators	(15)
3.	What is environmental management? Explain the various steps of environmental management.	(15)

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	UNIT-V (SUSTAINABILITY AND MANAGEMENT) **PART – A**
1.	What is zero waste?
2.	What is R concept?
3.	Give the advantages and disadvantages of R concept.
4.	What is circular economy?

5.	What are ISO and ISO14000 series?	
6.	What is life cycle assessment?	
7.	List the various steps involved in life cycle assessment.	
8.	What is environmental impact assessment?	
9.	List the various elements of EIA.	
10.	What is sustainable habitat?	
11	What is green building?	
12	What are green materials? Give examples.	
13	List the important green building materials.	
14	What is energy efficiency?	
15	List the advantages and disadvantages of energy efficiency.	
16	What is sustainable transport?	
17	What is sustainable energy?	
18	Define - non-conventional sources of energy.	
19	What is energy cycle?	
20	What is carbon emission?	
	PART – B	
1.	What is zero waste? Explain its concept and principles	(13)
2.	Explain the various steps to achieve zero waste? And advantages and disadvantages of zero waste.	(13)
3.	What is R concept? Explain its concept and advantages and disadvantages of R concept.	(13)
4.	What is circular economy? Explain various steps involved in achieving a circular economy.	(13)
5.	What are ISO and ISO14000 series? List out any 5 ISO14000 series standards.	(13)
6.	What is life cycle assessment? Explain the various stages involved in life cycle assessment.	(13)
7.	Explain the various elements of EIA.	(13)
8.	What is green building? Explain its criteria and features.	(13)

9.	What are green materials? Give examples. Explain important green building materials.	(13)
10.	What is energy efficiency? Explain methods of achieving energy efficiency? How to calculate it.	(13)
11.	What is sustainable transport? Explain the key elements of sustainable transport.	(13)
12.	What is sustainable energy? Explain advantages and disadvantages of it.	(13)
13.	What is energy cycle? Explain the carbon cycle with a neat diagram.	(13)
	PART – C	
1.	Write notes on non-conventional sources of energy.	(15)
2.	What are ISO and ISO14000 series? List out any ten ISO14000 series standards.	(15)

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