Reg. No. | | | | | | | | | |

ESH 501

Third Semester M.Sc. Degree Examination, April 2021

(CBCS)

ENVIRONMENTAL SCIENCE

Environmental Biology

Time : 3 Hours Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1. a) Homeostasis.
   b) Ecological pyramids.
   c) Sciophytes.
   d) Anemochory
   e) Commensalism
   f) Population density.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

2. Energy flow in ecosystem.
3. Diversity stability rule.
4. Effect of low and high temperature on animals.
5. Physiological effects of wind.
6. Causes for population explosion.
7. Predation.
8. Population characteristics.

P.T.O.

ESH 501

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Discuss the structure and functions of abiotic components in pond ecosystem.

10. Describe the influence of light on morphology and physiology of plants.

11. Explain relative humidity in relation to metabolism of organism with suitable examples.

Reg. No. | | | | | | | | | |

ESH 502

Third Semester M.Sc. Degree Examination, April 2021
(CBCS)
ENVIRONMENTAL SCIENCE
Solid Waste Management

Time : 3 Hours Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1. a) Global scenario of waste generated per capita.
   b) Ignitable wastes.
   c) Recycling of rubber.
   d) Detergent waste.
   e) Catalytic combustion.
   f) Resource Conservation and Recovery Act.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

2. TMRF operation.
3. Status of plastic wastes in India.
4. Recycling of domestic wastes.
5. Handling of hazardous solid wastes.
6. Scientific method of collection, segregation and transport of municipal solid wastes.
7. Waste minimization programs.
8. Agro-chemical wastes and strategies for controlling their pollution.

P.T.O.

ESH 502

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Give an account of refinery wastes focussing on types and disposal methods.

10. Discuss how radioactive elements cause pollution and management strategies. Add a note on sources and types.

11. Explain various technologies for biomedical waste treatment.

Reg. No. | | | | | | | | | |

ESS 504

Third Semester M.Sc. Degree Examination, April 2021
(CBCS)
ENVIRONMENTAL SCIENCE
Environmental Impact Assessment

Time : 3 Hours Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) :

(4×4=16)

1. a) Urbanization
   b) Unavoidable impacts
   c) Positive impacts
   d) Sustainable development
   e) Applications of EIA
   f) Environmental conflicts.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) :

(5×6=30)

2. Project implementation.
3. Policies and planning.
4. Need for EIA in industrialization.
5. Impacts on physical aspects.
6. Energy utilization and over exploitation.
7. International agencies involved in impact assessment studies.
8. Components of EIA.

P.T.O.

ESS 504

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Define environmental audit. Describe its methodology in India.

10. Explain the methods to predict the changes in biotic and abiotic components of environment due to projects.

11. Describe the methods of EIA with case studies.

Reg. No. | | | | | | | | | |

ESS 505

III Semester M.Sc. Degree Examination, April 2021

(CBCS)

ENVIRONMENTAL SCIENCE

Human Population and Environment

Time : 3 Hours Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1. a) Natality and Mortality
   b) Emigration
   c) Human rights
   d) Greenhouse gases
   e) Eutrophication
   f) Drug abuse as a threat to environment.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

2. Population growth and explosion.
3. Ozone depletion.
4. Pattern of population distribution.
5. Role of human society in forest conservation.
6. List medicinal plants.
7. Family welfare programme.
8. Traditional ecological knowledge.

P.T.O.

ESS 505

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Enlist the environmental problems due to the increase in population growth.

10. Explain the role of women in environmental conservation.

11. Describe environmental ethics-stewardship ethics and lifeboat ethics of Garret Hardin.

Reg. No. | | | | | | | | | |

ESH 401

First Semester M.Sc. Degree Examination, April 2021
(CBCS)
ENVIRONMENTAL SCIENCE
Environmental Chemistry

Time : 3 Hours Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) :

(4×4=16)

1. a) Saturated hydrocarbons
   b) Gibb's energy
   c) Chlorofluorocarbons
   d) Toxic chemicals in the environment
   e) Sources of water pollutants
   f) Photochemical smog.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) :

(5×6=30)

2. Give an account of radioisotopes in the environment.
3. Discuss the chemical processes in the formation of organic particulate matters.
4. Explain the effects of chemical pollution.
5. Describe the process of water pollution by heavy metals and metalloids.
6. Write a brief account on chemical composition of air.
7. Explain the chemistry of oil based and water based paints.
8. Discuss the physico-chemical basis of redox processes.

P.T.O.

ESH 401

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Discuss the physical and chemical properties of water in detail.

10. Explain the thermochemical and photochemical reactions in the atmosphere with suitable examples.

11. Give an account of biochemical aspects of heavy metals, toxic gases, pesticides and carcinogens in air.

Reg. No. | | | | | | | | | |

ESH 402

First Semester M.Sc. Degree Examination, April 2021
(CBCS)
ENVIRONMENTAL SCIENCE
Environmental Geology

Time : 3 Hours Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1. a) Classification of rocks.
   b) Soil horizons.
   c) Trace elements and REE.
   d) Minerals.
   e) Flood.
   f) Lithosphere.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

2. Write a note on different seasons on the Earth.
3. Give an account on different types of soil erosion.
4. Give a brief note on the mobility of the trace elements.
5. What are the factors controlling the depletion of natural resources ?
6. Write a note on Hydrosphere and Biosphere.
7. Give a note on geological agents in transportation of sediments.
8. Discuss various geological features of Karnataka.

P.T.O.

ESH 402

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. What is Landslide ? Describe the impact of Landslides with reference to the Karnataka.

10. Give a detailed account on origin of earth and internal structure of the Earth.

11. Write a detailed note on different methods of site selection in environmental planning.

Reg. No. | | | | | | | | | |

ESH 403

First Semester M.Sc. Degree Examination, April 2021

(CBCS)

ENVIRONMENTAL SCIENCE

Environmental Microbiology

Time : 3 Hours Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1. a) Rumen microflora.
   b) Radiation for sterilization.
   c) Gram positive cocci.
   d) Ectomycorrhiza.
   e) Pasteurization.
   f) Autochthonous microorganisms.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

2. Describe sources of microorganisms in air.
3. Write short note on the following fermented food products :
   a) Yogurt
   b) Sour cream
   c) Cheese.
4. Write a note on prevention of air-borne diseases.
5. Explain microbial phosphorus solubilization.
6. Explain predation and parasitism, with suitable examples.
7. Write a note on soil microflora.
8. What are culture media ? Explain different types of culture media and their uses with specific examples.

P.T.O.

ESH 403

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Draw a neat sketch of typical bacteria and explain the structure and functions of various parts.

10. Define nitrogen fixation. With suitable diagram, describe biological nitrogen fixation.

11. Discuss in detail about microbe-microbe interaction with examples.

Reg. No. | | | | | | | | | |

ESH 403

First Semester M.Sc. Degree Examination, April 2021
(CBCS) (Repeaters)
ENVIRONMENTAL SCIENCE
Environmental Microbiology

Time : 3 Hours Max. Marks : 70

Instruction** : Answer **all** the Parts and **draw neat** sketches **wherever necessary.

PART – A

I. Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1) Components of ecosystem
2) Bioindicators
3) Mineral leaching
4) Bioremediation
5) Microbial interaction
6) Classification of Algae.

PART – B

II. Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

7) Describe the concept and scope of Environmental microorganisms.
8) Explain the role of microorganisms in CNS cycles.
9) Give an account of microbes in petroleum product formation.

P.T.O.

10) Briefly explain the sampling techniques and identification of microbes.

11) Explain microbial degradation of pesticides.

12) Describe the treatment methods of solid and liquid industrial wastes.

13) Explain the microbe influenced corrosion and remedies.

PART – C

III. Answer **any two** of the following (**not** exceeding **8** pages **each**): **(2×12=24)**

14) Describe the microbial diversity of environment in detail.

15) Explain the bioremediation role in environmental management and mention the advantages and disadvantages.

16) Give an account of microorganisms in extreme environment and their adaptation.

Reg. No. | | | | | | | | | |

ESS 405

First Semester M.Sc. Degree Examination, April 2021
(CBCS)
ENVIRONMENTAL SCIENCE
Environmental Biotechnology

Time : 3 Hours

Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1. a) Phytoremediation
   b) GMO
   c) Bioinoculants
   d) Biofilms
   e) Biowarfare
   f) Clean technology.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

2. Intellectual property rights.
3. Biogas production.
4. Biodegradation of pesticides.
5. Advantages of biofertilizers.
6. Prevention of biofouling.
7. Utilization of industrial by products.
8. Mariculture.

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Explain intensive and extensive techniques of bioremediation.
10. Describe microbial mining with suitable examples.
11. Discuss biotechnological approach for the controlling of industrial pollution.

Reg. No. | | | | | | | | | |

ESS 405

First Semester M.Sc. Degree Examination, April 2021
(CBCS) (Repeaters)
ENVIRONMENTAL SCIENCE
Environmental Biotechnology

Time : 3 Hours Max. Marks : 70

Instruction : *Answer **all** the Parts and **draw** neat sketches **wherever** necessary.*

PART – A

I. Write short notes on **any four** of the following (**not** exceeding **2** pages **each**): **(4×4=16)**

1) In-situ and Ex-situ conservation
2) IUCN
3) Sacred Groves
4) Biosurfactants
5) Indicator species
6) Synthetic Dye.

PART – B

II. Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

7) Types of Biosensors
8) Biofuels
9) GMOs
10) Biochips
11) Production of Vermicompost
12) Biofilters
13) Microbial cellulolytic degradation of organic waste.

P.T.O.

PART – C

III. Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

14) Organic farming and its applications.

15) Biotechnological approaches for the degradation of tannery effluents.

16) Biofertilizers – Importance and classification.

Reg. No. | | | | | | | | | |

ESE 512

Third Semester M.Sc. Degree Examination, April 2021
(CBCS)
ENVIRONMENTAL SCIENCE
Waste Management (Open Elective)

Time : 3 Hours

Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) :

(4×4=16)

1. a) Biomedical waste

   b) Bioreactors

   c) Drinking water standards

   d) Composting

   e) Composition of sewage

   f) Disposal of textile waste.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) :

(5×6=30)

2. Microbial treatment of solid waste.

3. Give a brief note on Emission standards.

4. Effects of solid waste on environment.

5. Importance of waste management.

6. Various methods for recycling and reuse of solid wastes.

7. Physical methods used for treatment of liquid waste.

8. Physical and chemical properties of solid waste.

P.T.O.

ESE 512

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Write the classification and components of waste. Add a note on environmental standards.

10. Write an essay on solid waste management practices.

11. Describe the methods of liquid waste treatment.

Reg. No. | | | | | | | | | |

ESS 553

Fourth Semester M.Sc. Degree Theory Examination, October 2021
(CBCS)
ENVIRONMENTAL SCIENCE
Environmental Pollution and Management

Time : 3 Hours

Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1. a) Minamata disease
   b) Non-ionizing radiation
   c) X-rays
   d) Dead zones
   e) Eutrophication
   f) PAN.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

2. Give an account of aeroallergens.
3. Discuss the impact of thermal pollution.
4. Write a note on effects of soil pollution.
5. Sources of radioactive pollution.
6. Discuss the waste water treatment methods by biological means.
7. How can air pollution be mitigated ?
8. Explain the properties of air pollutants.

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Write an essay on sources, effects and control measures of water pollution.
10. Write an essay on sources of noise pollution and a note on legal regulations. Explain its effect on humans and wildlife.
11. Write an essay on effects of radiation on human health. Add a note on radioactive waste handling and disposal.

Reg. No. | | | | | | | | | |

ESH 551

Fourth Semester M.Sc. Degree Theory Examination, October 2021
(CBCS)
ENVIRONMENTAL SCIENCE
Conservation of Biodiversity

Time : 3 Hours Max. Marks : 70

Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1. a) β diversity.
   b) Rare species of Western Ghats.
   c) Mangroves of Karnataka.
   d) Nilgiri biosphere.
   e) Endemic species.
   f) Project tiger.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**). **(5×6=30)**

2. Biowealth.
3. Man-wildlife conflicts.
4. Sacred grooves and its significance.
5. Biological Diversity Act of India.
6. Paradigms of biodiversity.
7. Biodiversity hotspots of India.
8. Species extinction.

Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9. Give a detailed account of man and biosphere program.
10. Differentiate between *in situ* and *ex situ* conservation. Add a note on their advantages and limitations.
11. Discuss the values of biodiversity with examples.

Reg. No. | | | | | | | | | |

ESE 461

II Semester M.Sc. Degree Examination, September/October 2022
(CBCS)
ENVIRONMENTAL SCIENCE
Basics of Environmental Science (Open Elective)

Time : 3 Hours Max. Marks : 70

I. Write short notes on **any four** of the following (**not** exceeding **2** pages **each**). **(4×4=16)**

1) a) Temperature.
   b) Hydrosphere.
   c) Pressure.
   d) Global warming.
   e) Water related issues.
   f) Gaseous cycles.

II. Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**). **(5×6=30)**

2) Marine water.
3) Atmosphere.
4) Artificial rain.
5) Lithosphere.
6) Cycling of heavy metals.
7) Biological properties of water.
8) Sources of water and management.

III. Answer **any two** of the following (**not** exceeding **8** pages **each**). **(2×12=24)**

9) Discuss the influence of temperature and light as abiotic factors in freshwater.
10) Explain the impact of ozone hole and greenhouse effect on environment.
11) Discuss the effect of anthropogenic activities on biogeochemical cycles.

Reg. No. | | | | | | | | | |

ESH 451

Second Semester M.Sc. Degree Examination, September/October 2022
(CBCS)
ENVIRONMENTAL SCIENCE
Water and Wastewater Management

Time : 3 Hours

Max. Marks : 70

1. Write short notes on **any four** of the following (**not** exceeding **2** pages **each**). **(4×4=16)**
   a) Sources of water.
   b) Aquifers.
   c) Water softening process.
   d) Sludge drying beds.
   e) Water table.
   f) Wastewater characteristics.

Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**). **(5×6=30)**

2. Physical and chemical properties of water.
3. Groundwater quality.
4. Methods of disinfection.
5. Primary treatment of wastewater.
6. Processes of water purification.
7. Types of water demands.
8. Water harvesting and watershed management.

Answer **any two** of the following (**not** exceeding **8** pages **each**). **(2×12=24)**

9. Define water pollution. Describe the sources and types of water pollution.
10. Explain groundwater zones and system.
11. Write an essay on secondary treatment of wastewater.

Reg. No. | | | | | | | | | |

ESH 452

II Semester M.Sc. Degree Examination, Sept./Oct. 2022
(CBCS)
ENVIRONMENTAL SCIENCE
Occupational Health Hazards

Time : 3 Hours

Max. Marks : 70

I. Write short notes on **any four** of the following : (not exceeding **2** pages **each**) : **(4×4=16)**

1) a) Anthracosis
   b) Airborne allergens
   c) Types of food poisoning
   d) Cholera
   e) Sickness absenteeism
   f) Chemical hazards at workplace.

II. Write explanatory notes on **any five** of the following (not exceeding **3** pages **each**) : **(5×6=30)**

2) Listeriosis.
3) Legislatory measures and factory acts in preventing the occupational hazards.
4) Physical environment features on workplace accidents.
5) Significance of food safety measures.
6) Lead poisoning and its consequences.
7) Asbestosis and Silicosis.
8) Public health programs implemented for workplace hazard monitoring.

III. Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9) Write a detailed note on the measures designed for securing the safety and health of workers.
10) Elaborate on the radiation hazards in workplace with emphasis on any two radiation accident episodes.
11) Explain the pathogenesis and prevention measures for (i) Typhoid and (ii) Hepatitis-A, as waterborne diseases.

Reg. No. | | | | | | | | | |

ESS 454

II Semester M.Sc. Degree Examination, September/October 2022
(CBCS)
ENVIRONMENTAL SCIENCE
Environmental Toxicology

Time : 3 Hours Max. Marks : 70

I. Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1) a) Drug toxicity
   b) LD_{50}
   c) Biomagnification
   d) S9 fraction
   e) Particulate matter sources
   f) Toxicity curves.

II. Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

2) Factors influencing toxicity.
3) Dose response relationship curve.
4) Environmental forensics.
5) Biotransformation.
6) Field based microbial bioassay for toxicity testing.
7) Importance and significance of bioassay.
8) Selective toxicity.

III. Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

9) Describe the mechanism of toxicity and receptor mediated events.
10) Discuss the toxicology of major pesticides and their impacts on environment.
11) Explain the mechanism of impact of particulate matter on cardio-vascular system.

Reg. No. | | | | | | | | | |

ESS 455

Second Semester M.Sc. Degree Examination, September/October 2022
(CBCS)
ENVIRONMENTAL SCIENCE
Remote Sensing and GIS

Time : 3 Hours

Max. Marks : 70

I. Write short notes on **any four** of the following (**not** exceeding **2** pages **each**) : **(4×4=16)**

1) Spatial resolution
2) Thermal sensor
3) Different types of platforms used for remote sensing.
4) Geo-stationary orbit
5) Digital image data formats
6) CRZ

II. Write explanatory notes on **any five** of the following (**not** exceeding **3** pages **each**) : **(5×6=30)**

7) Give the spectral range, bands,resolution of MSS/PAN/WiFS in Landsat4 and IRS 1-C.
8) Explain the operation of along-track and across-track scanners.
9) Elements of image interpretation.
10) Biophysical modeling
11) Types of geometric errors
12) Various components of GIS
13) Draw a neat sketch of EMR and indicate UV, visible and IR portion.

III. Answer **any two** of the following (**not** exceeding **8** pages **each**) : **(2×12=24)**

14) Explain the interaction of EMR with vegetation, soil and water.
15) Describe the methods of photogrammetry in detail.
16) Explain GIS and its uses for environmental monitoring.
