

Total No. of Questions :8]

SEAT No. :

P1330

[5437]-11

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV-101: Environmental Geoscience

(2008 Pattern) (Semester-I)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Answer to the two sections should be written in separate answer books.*

SECTION-I

Q1) Attempt Any two from the following: **[10]**

- a) Describe the geological time scale.
- b) Draw and describe the structure of earth.
- c) Briefly explain the cycle of erosion.

Q2) Answer Any two from the following: **[10]**

- a) Draw and describe any two geomorphological land forms.
- b) Describe and draw land use and soil survey methods.
- c) Explain in brief weathering and its causing agents.

Q3) Attempt Any two from the following: **[10]**

- a) Draw and describe a complete soil profile.
- b) Define mineral. Add a note on its classification.
- c) Discuss the role of moisture in precipitation.

P.T.O.

- Q4)** Write short notes on any two: **[10]**
- a) Rock classification
 - b) Glaciated Regions in India
 - c) Characteristic of igneous rocks.

SECTION-II

- Q5)** Attempt Any two from the following: **[10]**
- a) Explain the factors responsible for droughts.
 - b) Differentiate between cyclone and thunderstorm.
 - c) Dry and wet adiabatic lapse rate.

- Q6)** Attempt Any two from the following: **[10]**
- a) Explain the phenomenon of volcano eruption.
 - b) Write in brief on soils of India.
 - c) Classify the sedimentary rocks with examples.

- Q7)** Attempt Any two from the following: **[10]**
- a) What is landslide. Explain the causes of land displacement.
 - b) What are the hazards of Tsunamis in coastal area.
 - c) Give origin and composition of sea water.

- Q8)** Write short notes on any two: **[10]**
- a) Trace elements and health.
 - b) Lightning in atmosphere
 - c) Evaluation of atmosphere.



Total No. of Questions : 8]

SEAT No. :

P1331

[5437]-12

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 102 : Environmental Chemistry

(2008 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *All questions carry equal marks.*

SECTION - I

Q1) Answer the following (any two): **[10]**

- a) Define the term Environmental chemistry? Explain its scope.
- b) Explain biological functions of proteins.
- c) What is meant by Biogeochemical cycles? Explain Nitrogen cycle with suitable diagram.

Q2) Answer the following (any two): **[10]**

- a) Explain chemical carcinogenesis with suitable examples.
- b) Discuss process of pesticide degradation.
- c) Describe environmental problems of detergents.

Q3) Answer the following (any two): **[10]**

- a) Discuss environmental problems of hydrocarbons.
- b) Write classification of surfactants with suitable examples.
- c) What are enzymes? Discuss role of enzymes in environmental processes.

Q4) Write short notes on the following (any two): **[10]**

- a) Biomagnification of DDT
- b) Modified Detergents
- c) Biosynthesis of DNA

P.T.O.

SECTION - II

Q5) Answer the following (any two): **[10]**

- a) Discuss process of polymer decay.
- b) Discuss impact of lead and its compounds on human health.
- c) Explain principle and working of colorimetry.

Q6) Answer the following (any two): **[10]**

- a) Explain working of Gas chromatography with suitable diagram.
- b) Describe importance of isotope dilution technique.
- c) Explain acid base reactions with suitable examples.

Q7) Answer the following (any two): **[10]**

- a) Explain destruction methods of Acid halides.
- b) Describe principle merits and demerits of Neutron Activation Analysis.
- c) Draw block diagram of AAS and write its merits and demerits.

Q8) Write short notes on the following (any two): **[10]**

- a) Classification of synthetic polymers
- b) Aflatoxin toxicity
- c) Destruction of halogenated compounds.



Total No. of Questions : 8]

SEAT No. :

P1332

[5437]-13

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 103 : Environmental Biology

(2008 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *All questions carry equal marks.*

SECTION - I

Q1) Answer any two of the following: **[10]**

- a) Discuss single channel energy flow model of an ecosystem.
- b) Which factors are responsible to maintain ecosystem stability?
- c) Write an account on development and evolution of ecosystem.

Q2) Answer any two of the following: **[10]**

- a) Discuss applications of microbiology in environmental studies.
- b) How microbes are associated with plants and animals?
- c) What are major biomes of the world?

Q3) Answer any two of the following: **[10]**

- a) Explain various interactions studied in community ecology.
- b) Discuss floral and faunal diversity in hot spots of India.
- c) Which are biogeographic zones of India?

Q4) Write short notes on any two of the following: **[10]**

- a) Current status of Forests in India
- b) Ecological Niche
- c) Ecological functions of Wetlands

P.T.O.

SECTION - II

Q5) Answer any two of the following: **[10]**

- a) Write an account on endangered species of India.
- b) Discuss in detail conservation issues associated with wetlands.
- c) What are various threatened species categories of IUCN?

Q6) Answer any two of the following: **[10]**

- a) What are applications of environmental biotechnology in species conservation?
- b) Discuss in detail coverage of protected areas network in India.
- c) Which are the strategies used for management of wildlife?

Q7) Answer any two of the following: **[10]**

- a) What are quarantine regulations for conservation of species in India?
- b) Explain the factors that influence wildlife management.
- c) Discuss salient features of marine ecosystems.

Q8) Write short notes on any two of the following: **[10]**

- a) Global Agreements for Biodiversity Conservation.
- b) Biodiversity Act and Conservation.
- c) In-Situ and Ex-situ conservation.



Total No. of Questions : 4]

SEAT No. :

P1333

[5437]-14

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV-104 : Statistical & Research Methods

(2008 Pattern) (Semester-I)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *All questions carry equal marks.*
- 3) *Figures to the right indicate full marks.*

SECTION-I

Q1) Solve any two from the following.

[20]

a) Explain the following term.

- i) Sample
- ii) Population
- iii) Probability
- iv) Arithmetic Mean
- v) Standard deviation.

b) Write a brief note on kurtosis.

c) Calculate median and mode from the following data.

Class	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	5	10	20	25	15	5

Q2) Solve any two of the following:

[20]

a) Write a note on Histogram.

b) Four cards are drawn at random from well shuffled pack of 52 cards ; Find the probability that

- i) Two cards are spade and Two cards are diamond.
- ii) One is king.

c) Calculate correlation coefficient from the following data.

X	2	4	6	8	10	12
Y	4	2	5	10	4	11

P.T.O.

SECTION-II

Q3) Solve any two of the following. **[20]**

- a) Explain the following term:
- i) Parameter
 - ii) Null hypothesis
 - iii) Time series model
 - iv) Alternative hypothesis
 - v) Type-I Type-II error.
- b) Various investigation were made for testing the incidence of heavy infection of malarial parasite plasmodium falciparum in group of children with heterozygotes and group of children with the normal homozygotes. The findings in these investigations were as follows.

Group of Children	Heavy Infection	Non infected
Children with heterozygotes	18	50
Children with normal homozygotes.	62	127

Test whether the heterozygotes are better protected than normal homozygotes from malarial infections.

- c) Explain the method of calculations for two way ANOVA.

Q4) Solve any two of the following. **[20]**

- a) Explain the t-test for testing the significance of population mean.
- b) What is correlation? Explain the types of correlation.
- c) Discuss application of computer based modelling for population studies with suitable example.

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Total No. of Questions : 8]

SEAT No. :

P1334

[5437]-21

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV-201 : Environmental Economics

(Semester - II) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *All questions carry equal marks.*

SECTION - I

Q1) Solve any two :

[10]

- a) Define environmental economics? Explain the inter linkages between the economy and the environment.
- b) Define Public goods? Explain the theory of public goods.
- c) Explain social cost and how does it effect the national economy.

Q2) Solve any two :

[10]

- a) What are the Economic instruments for Environmental protection? Explain the effectiveness of these instruments.
- b) Define Natural resources? Explain the economics of natural resources exploitation.
- c) Differentiate between renewable and non renewable resources according to exploitation.

Q3) Answer any two from the following :

[10]

- a) Explain the methods of valuation of Environmental costs & benefits.
- b) Define economic growth? Explain Kuznet's curve.
- c) Define FDI? Explain relation between FDI inflow and environmental quality.

P.T.O.

- Q4)** Write a note on any two : **[10]**
- a) Sustainable Development.
 - b) Climate change.
 - c) Carbon credit.

SECTION - II

- Q5)** Attempt any two from following : **[10]**
- a) Define Economic reform? Explain in details.
 - b) What is Public participation? Explain the role of public participation in environmental programmes.
 - c) How Externalities and market failure are closely related?

- Q6)** Justify the statements (Any Two) : **[10]**
- a) “Environmental policies play a significant role in sustainable development”.
 - b) “Economic policies are effected by International policies”.
 - c) “Effectiveness of command and control in environmental economics”.

- Q7)** Answer any two of the following : **[10]**
- a) How cost-benefit analysis help to audit the natural resources? Explain for audit benefit.
 - b) How sustainable development helps to environmental problems?
 - c) Explain sustainability indicators & its significance in policy making.

- Q8)** Write a note on any two : **[10]**
- a) Challenges to environmental economics.
 - b) UNEP.
 - c) Subsidies.



Total No. of Questions : 8]

SEAT No. :

P1335

[5437]-22

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV-202 : Water and Wastewater Engineering

(2008 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *All questions are compulsory.*
- 4) *All questions carry equal marks.*

SECTION - I

Q1) Answer any two :

- a) What is water demand? Enlist factors affecting it.
- b) Explain the significance of population forecasting. Elaborate one method.
- c) Why are water quality standards necessary?

Q2) Answer any two :

- a) What is meant by hardness of water? Give a method of softening.
- b) Explain the principle of sedimentation. How does particle size affect it?
- c) Differentiate between slow and rapid sand filters.

Q3) Answer any two :

- a) What is the role of disinfection in water treatment? Explain one method.
- b) Write a note on advanced water treatment. What are the methods used?
- c) Describe the process of aeration and the methods for aeration.

Q4) Write short notes on any two :

- a) Clariflocculation.
- b) Reverse osmosis.
- c) Electrodialysis.

P.T.O.

SECTION - II

Q5) Answer any two :

- a) Discuss the objectives of waste water treatment.
- b) What is the impact of quality of life on sewage quality & quantity?
- c) Draw a flow diagram for a sewage treatment plant.

Q6) Answer any two :

- a) Explain the functioning of grit chamber with a diagram.
- b) Why is it necessary to determine DO, BOD & COD in waste water?
- c) Write about the importance of aeration in biological treatment. Add a note of the types of aeration.

Q7) Answer any two :

- a) What are the characteristics of sugar-industry effluent? Draw a flow chart of sugar ETP.
- b) Explain the significance of anaerobic digestion & the process.
- c) What methods are used for treatment by high strength waste?

Q8) Write short notes on any two :

- a) Treatability studies.
- b) Root zone technology.
- c) RBC.



Total No. of Questions : 8]

SEAT No. :

P1336

[5437]-23

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 203 : Environmental Pollution - I : Water & Soil

(2008 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *All questions carry equal marks.*

SECTION - I

Q1) Answer any two :

- a) Explain the types and sources of fresh water pollution.
- b) Write about the importance of water quality parameters.
- c) What are the types of sampling methods? How is suitable method decided.

Q2) Answer any two :

- a) What are the impacts of agriculture on water pollution?
- b) Explain the consequences of water pollution on economy.
- c) What are the equipments used for water sampling?

Q3) Answer any two :

- a) What are the sources of marine pollution?
- b) What are the standards for disposal of sewage into sea?
- c) Give the impacts of oil spills on marine biodiversity.

Q4) Write short notes on any two :

- a) Ballast water.
- b) Pesticide pollution.
- c) Water quality standards.

P.T.O.

SECTION - II

Q5) Answer any two :

- a) What are the sources of soil pollution? What are the consequences?
- b) Write a note on soil sampling.
- c) What is the impact of solid waste disposal on soil?

Q6) Answer any two :

- a) Write about deterioration of soil due to mining.
- b) Explain the type based classification of solid wastes.
- c) Write about energy generation from solid wastes.

Q7) Answer any two :

- a) What is meant by radioactive pollution?
- b) What are the biological effects of radiation?
- c) Explain the model of radioactive decay.

Q8) Write short notes on any two :

- a) GM counter.
- b) 3R principle.
- c) Lime sludge.



Total No. of Questions : 8]

SEAT No. :

P1337

[5437]-24

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 204 : Environmental Law Ethic and Policy

(2008 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in Separate books.*
- 2) *Neat diagrams must be drawn whenever necessary.*
- 3) *Black figures to the right indicate full marks.*
- 4) *All questions carry equal marks.*

SECTION - I

Q1) Answer any two of the following. **[10]**

- a) What are the outcomes of Rio conference?
- b) Discuss in detail on role of united nations authorities in protection of global environment.
- c) What are functions of central pollution board to project environment?

Q2) Answer any two of the following. **[10]**

- a) Discuss the need for environmental governance in India.
- b) Write an account on multinational agreements carried out for protection of environment.
- c) Discuss salient features of environment protection act.

Q3) Answer any two of the following. **[10]**

- a) What are fundamental rights conferred by the constitution of India to its citizens?
- b) What are the objectives of various antipollution acts?
- c) What are the guidelines under regulations for the management of hazardous wastes?

Q4) Write short notes on any two of the following. **[10]**

- a) Nairobi Declaration.
- b) Panchayat Raj System.
- c) Role of Courts in Environment Protection.

P.T.O.

SECTION - II

Q5) Answer any two of the following. **[10]**

- a) What is the role of environmental resources in sustainable development?
- b) What are the guidelines for management of biomedical wastes under regulations?
- c) Discuss importance of plan in relation with long term gains and effect on environment.

Q6) Answer any two of the following. **[10]**

- a) Discuss the important bases for sustainable development.
- b) Write an account on rate of utilization and regeneration of resources.
- c) What are the requirements under rule 14 for environmental audit under EPA, 1986?

Q7) Answer any two of the following. **[10]**

- a) What are the guidelines to carry out environmental impact assessment?
- b) Discuss on the need for protection of environment in relation with survival of mankind.
- c) Elaborate on exploitation of resources and safeguards for conservation.

Q8) Write short notes on any two of the following: **[10]**

- a) Natural Vs Manmade Growth.
- b) National Environmental Policy.
- c) Municipal Solid Waste Management Rules.



Total No. of Questions :8]

SEAT No. :

P1338

[5437]-31

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV-301: Air pollution & Climate Change

(2008 Pattern) (Semester-III)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer to the two section should be written in separate answer books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *All questions carry equal marks.*
- 4) *All question are compulsory.*

SECTION-I

Q1) Attempt Any two of the following:

- a) Discuss in detail sources of air pollution.
- b) Describe in detail reactions in the atmosphere.
- c) How air pollutants are classified? Explain in brief.

Q2) Attempt Any two of the following:

- a) Define air pollutant and add a note on their effect on human.
- b) Write a note on vehicular pollution.
- c) “Vehicular pollution is more hazardous then Industry.” Justify.

Q3) Attempt Any two of the following:

- a) What is Global warming? Write its effect in detail.
- b) Write in detail classification and effect of aerosols.
- c) What are principle causes of air pollution in Thermal power plant?

P.T.O.

Q4) Write Short notes (any two) of the following:

- a) Monitoring methods of particulate matter.
- b) Effect of Ozone depletion
- c) Effect of NO₂ on animal.

SECTION-II

Q5) Answer any two of the following:

- a) How does fuel selection help in air pollution control? Give examples.
- b) Write about the advantages and disadvantages of dry and wet collection of particulates. List the equipment accordingly in two categories.
- c) Explain the principle and working of cyclone.

Q6) Attempt Any two of the following:

- a) Describe the different methods of cleaning fabric filters.
- b) Write about the different types of incinerators.
- c) What are the factors affecting the efficiency of absorption. Name some commonly used absorbents.

Q7) Answer any two:

- a) What is CDM? How does it help in addressing climate change.
- b) What is carbon sequestration and its role in controlling global warming.
- c) Give the background and working of UNFCCC

Q8) Write short notes on any two:

- a) Advantages & limitations of ESP
- b) Certified Emission Reduction
- c) Reverse jet filter.



Total No. of Questions : 8]

SEAT No. :

P1339

[5437]-32

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCES

**ENV - 302 : EIA and Environmental Auditing
(2008 Pattern) (Semester - III)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Answer to the two sections should be written in separate answer books.*

SECTION - I

Q1) Attempt any two from the following: **[10]**

- a) Describe the history of EIA, in India.
- b) Discuss the public hearing process in detail.
- c) In an EIA report, how 'analysis of alternatives' is explained.

Q2) Attempt any two from the following: **[10]**

- a) Explain primary and secondary data collection for baseline studies.
- b) Which are the steps involved in impact assessment and prediction for water environment.
- c) Explain the process of constitution of state expert appraisal committee (SEAC) & state EIA authority (SEIAA).

Q3) Attempt any two from the following: **[10]**

- a) Discuss the principles of National Environment Policy (NEP) 2006.
- b) Explain the significance of baseline data collection and also briefly state the methodology of data collection.
- c) Assess an impact of mining activity on air & socio-economy aspects.

Q4) Write short notes on any two: **[10]**

- a) Matrix method of impact assessment
- b) Screening
- c) Overlays method

P.T.O.

SECTION - II

Q5) Attempt any two from the following: **[10]**

- a) Discuss the social issues involved in the EIA of construction of dam.
- b) Prepare an environment management plan for a sugar industry.
- c) Conduct an impact assessment of petro-chemical industry on land use aspect.

Q6) Attempt any two from the following: **[10]**

- a) In case of housing project, which aspects/components are very important in impact assessment process?
- b) Discuss the risk assessment for a high way project.
- c) Predict an impact of thermal power plant on air quality of its surrounding with proposing control & mitigation measures.

Q7) Attempt any two from the following: **[10]**

- a) What is an ISO 14000? and discuss its importance.
- b) Why audits are important and explain the elements of environmental audit statement.
- c) Explain how to collect data on soil & hydro-geology aspects.

Q8) Write short notes on any two: **[10]**

- a) Pre and post audit activities.
- b) Pollution and hazardous waste audit.
- c) Cost benefit analysis.



Total No. of Questions : 8]

SEAT No. :

P1340

[Total No. of Pages : 2

[5437]-33

M.Sc.

ENVIRONMENTAL SCIENCE

ENV- 303 : Remote Sensing and GIS

(2008 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Answer to the two sections should be written in separate answer books.*

SECTION - I

Q1) Attempt any two from the following : **[10]**

- a) Explain the basic geometric characteristics of aerial photographs.
- b) Enumerate the basic entities of GIS.
- c) How spatial data is acquired by georeferencing.

Q2) Answer any two from the following : **[10]**

- a) Explain how multilayer operations are useful during analysis of spatial data.
- b) Discuss synergy between Remote sensing and GIS.
- c) What are grid base operations. Give their applications.

Q3) Attempt any two from the following : **[10]**

- a) Differentiate between microwave and lidar sensing.
- b) Distinguish between image reflection and image manipulation.
- c) Briefly explain Landsat satellite programme.

P.T.O.

Q4) Write short notes on any two : **[10]**

- a) Across and along-track sensing
- b) Hyperspectral sensing
- c) IRS series.

SECTION - II

Q5) Attempt any two from the following : **[10]**

- a) Discuss the concept of space and time.
- b) How infrared imageries are different from thermal infrared imageries.
- c) Explain application of GIS mapping in urban planning.

Q6) Attempt any two from the following : **[10]**

- a) What are the applications of network analysis.
- b) Differentiate between vector and Raster scale mapping.
- c) Briefly explain the geologic and soil mapping techniques.

Q7) Attempt any two from the following : **[10]**

- a) Enumerate the significance of non-spatial data.
- b) What are essential components and data file management in data base management system (DBMS).
- c) Explain the various methods of digitization.

Q8) Write short notes on any two : **[10]**

- a) TIN
- b) Hyperspectral sensing
- c) Atmospheric window



Total No. of Questions : 8]

SEAT No. :

P1341

[5437]-34

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV 311 : Restoration Ecology (Optional Course 1)

(2008 Pattern) (Semester-III)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *All questions carry equal marks.*

SECTION-I

Q1) Answer any two of the following. **[10]**

- a) Explain ecological principles of restoration ecology.
- b) Describe process of restoration of saline soil with suitable examples.
- c) Discuss role of rhizosphere microflora in decontamination of polluted soil.

Q2) Answer any two of the following. **[10]**

- a) Explain stages of ecological succession with suitable examples.
- b) Describe bioremediation of mining sites with examples.
- c) Discuss phytoremediation process for restoration of heavy metal contaminated soil with suitable examples.

Q3) Answer any two of the following. **[10]**

- a) Explain restoration of degraded ecosystems with suitable examples.
- b) Describe bioremediation of hydrocarbon contaminated sites.
- c) Explain importance of interaction between biotic and abiotic components in restoration ecology.

Q4) Write short notes on any two of the following. **[10]**

- a) Restoration of contaminated riverine ecosystem.
- b) Role of pioneer species.
- c) Restoration of solid waste dumping sites.

P.T.O.

SECTION-II

Q5) Answer any two of the following. **[10]**

- a) Explain hydrological characteristics of watershed.
- b) Describe concept of watershed with suitable diagram.
- c) Discuss role of organic farming in soil conservation process.

Q6) Answer any two of the following. **[10]**

- a) Discuss role of small-scale irrigation systems in watershed development.
- b) Describe land use and land cover classification.
- c) Describe role of watershed management in soil conservation.

Q7) Answer any two of the following. **[10]**

- a) Discuss process of resource appraisal in watershed management.
- b) Describe agrosilvopastoral systems with suitable examples.
- c) Explain process of rainwater harvesting with suitable diagram.

Q8) Write short notes on any two of the following. **[10]**

- a) Watershed development for semiurban areas
- b) Drain line and area treatment
- c) Criteria for selection of plant species for plantation

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Total No. of Questions : 8]

SEAT No. :

P1342

[5437]-35

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV-312 : Biodiversity and Conservation

(2008 Pattern) (Semester-III)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Answer to the two sections should be written in separate answer books.*

SECTION-I

Q1) Attempt any two from the following. **[10]**

- a) Explain the reasons for loss of biodiversity
- b) Describe in detail composition and levels of biodiversity
- c) Explain scope of biodiversity science.

Q2) Answer any two from the following. **[10]**

- a) With the help of suitable example, explain endemism
- b) Write in detail about biodiversity services,
- c) Explain approaches to monitoring of biodiversity

Q3) Attempt any two from the following. **[10]**

- a) Explain ecological theories of species diversity
- b) Discuss in detail IUCN threatened species categories.
- c) Why inbreeding is considered as an issue of biodiversity loss?

Q4) Write short notes on any two **[10]**

- a) Introduced species
- b) Ramsar Convention
- c) Genetic diversity

P.T.O.

SECTION-II

Q5) Attempt any two from the following. **[10]**

- a) Explain values of biodiversity
- b) Write about dynamics of changes in biodiversity
- c) Explain the tools and techniques of data collection and information management.

Q6) Answer any two from the following. **[10]**

- a) Explain the role of CITES in biodiversity conservation.
- b) Explain necessity of biodiversity conservation and add a note on current practices of conservation
- c) Discuss the role of education institutions in biodiversity conservation.

Q7) Attempt any two from the following. **[10]**

- a) Explain the role of biotechnology in biodiversity conservation.
- b) Discuss the concept of sustainable development
- c) Explain the importance of sacred groves

Q8) Write short notes on any two **[10]**

- a) In-situ & Ex-situ methods of biodiversity conservation
- b) WWF
- c) Bio-piracy

✓ ✓ ✓

Total No. of Questions : 8]

SEAT No. :

P1343

[5437]-41

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

**ENV-401 : Environmental Health, Toxicology & Safety
(2008 Pattern) (Semester - IV)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *All questions carry equal marks.*
- 4) *All questions are compulsory.*

SECTION - I

Q1) Answer any two of the following :

- a) What is the inter relationship between health & environment?
- b) How are potential safety issues identified in chemical industry?
- c) Write about safety standards and management systems.

Q2) Attempt any two of the following :

- a) Differentiate between hazard & risk.
- b) Write about the significance of mock drills in safety awareness.
- c) How does noise pose a risk in industry?

Q3) Answer any two of the following :

- a) Elaborate upon the National Policy for disaster management.
- b) How does pollution affect environmental health?
- c) Give the role of EMS in safety & risk evaluation.

Q4) Write short notes on any two :

- a) ISO 18000.
- b) HIRA.
- c) Disaster management plan.

P.T.O.

SECTION - II

Q5) Answer any two of the following :

- a) What is toxicology & why is it important for environmental studies?
- b) Write a note on dose-response relationship and its significance in toxicology.
- c) Write about the methods used to measure toxicity.

Q6) Answer any two of the following :

- a) Differentiate between acute & chronic toxicity.
- b) Write about the stages in development of cancer.
- c) Explain the metabolic effects of VOCs.

Q7) Answer any two of the following :

- a) Comment on the control of epidemics caused by air borne viruses.
- b) What is biological warfare? Explain with examples.
- c) Write about the role of WHO in public health.

Q8) Write short notes on any two :

- a) LC_{50} .
- b) Heavy metal toxicity.
- c) Mutagens.



Total No. of Questions : 8]

SEAT No. :

P1344

[5437]- 42

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 402 : Watershed Management

(2008 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Answers to the two sections should be written in separate answer books.*

SECTION - I

Q1) Attempt any two from the following : **[10]**

- a) Define 'Watershed' and discuss its principles and objectives.
- b) Explain the significance of topographic features of an area in watershed management.
- c) Discuss the guidelines for watershed resource appraisal.

Q2) Answer any two from the following : **[10]**

- a) Discuss the planning for land use and soil conservation aspect of watershed planning .
- b) Explain the basic steps considered in water conservation.
- c) How watershed survey is carried out ?

Q3) Attempt any two from the following : **[10]**

- a) Why people's participation is important in any watershed development and management.
- b) Explain the importance of environmental regeneration due to watershed programme.
- c) Explain hydrological processes involved in watershed.

Q4) Write short notes on any two : **[10]**

- a) Contour farming
- b) Water & Wind erosion of soil
- c) Evapo - transpiration

P.T.O.

SECTION - II

Q5) Attempt any two from the following : **[10]**

- a) Discuss the mechanical measures for water erosion control.
- b) Explain the importance of tillage practices in aerable land.
- c) Why reclamation of ravine land is important ?

Q6) Answer any two of the following : **[10]**

- a) Explain contour trenches and its benefits.
- b) Discuss different traditional methods of water harvesting.
- c) Explain the objectives and benefits of agro - forestry.

Q7) Attempt any two from the following : **[10]**

- a) State the functions of nala bund.
- b) Discuss watershed based farming system.
- c) Explain roof - top water harvesting using neat labelled diagram.

Q8) Write short notes on any two : **[10]**

- a) Energy Plants / Crops.
- b) Vegetative ridges.
- c) Role of soil characteristics.



Total No. of Questions : 8]

SEAT No. :

P1345

[5437]-43

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 411 : Forestry & Habitat Management (Optional)

(2008 Pattern) (Semester - IV) (Term End)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *All questions carry equal marks.*

SECTION - I

Q1) Answer any two of the following :

- a) Explain the concepts, scope and need of habitat management.
- b) Explain the importance of nutrient cycling in forest.
- c) Explain the biotic components and its stress on forest ecosystem.

Q2) Answer any two of the following :

- a) What is Ethnobotany? Give its importance with respect to cultural and medical aspect.
- b) Explain the cultural tradition of tribes and forest.
- c) How cultural and traditional practices influence on forestry programme?

Q3) Discuss any two of the following :

- a) Discuss the principles of Joint Forest Management programme.
- b) Discuss the key practices used in Silviculture.
- c) Discuss the importance and role of Joint Forest Management Programme.

Q4) Write notes on any two of the following :

- a) Terms and terminologies in Forest and Habitat Management.
- b) Mangroves.
- c) Forest types in India.

P.T.O.

SECTION - II

Q5) Answer any two of the following :

- a) How development activities influence on forest system?
- b) Explain the impact of deforestation on forest ecosystem.
- c) Explain the importance of insitu and ex-situ forest resources conservation programme.

Q6) Attempt any two of the following :

- a) Explain the application of Remote Sensing and GIS in forest management.
- b) Explain in brief about forest fires in India.
- c) Explain in brief ecological factors influencing Silvicultural practices.

Q7) Describe any two of the following :

- a) Describe the general principles in surveying and forest engineering.
- b) Describe the various units of measurement of forest mensuration.
- c) Describe the forest crusing instrument for standing timber.

Q8) Write notes on any two of the following :

- a) Wildlife Protection Act 1972 and their amendments.
- b) National Forest Policy 1988 of People's involvement.
- c) Application of Indian Penal code to Forestry.



Total No. of Questions : 8]

SEAT No. :

P2961

[Total No. of Pages : 2

[5437]-44

M.Sc. (Semester - IV)

ENVIRONMENTAL SCIENCE

**ENV - 412 : Environmental Planning Management
(2008 Pattern)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer to the two sections should be written in separate books.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) All questions carry equal marks.*
- 4) All questions are compulsory.*

SECTION - I

Q1) Solve any two from the following. [10]

- a) How historical background of planning helps in any developmental project?
- b) What is concept of planning? Discuss in brief parameters of planning.
- c) "Development is not possible without exploitation of natural resources" Comment.

Q2) Attempt any two from the following. [10]

- a) Define environmental planning and add a note on advantages of planning in development.
- b) Write important issues in brief for environmental planning.
- c) What is rural planning? Write in brief parameters of rural planning.

Q3) Solve any two from the following. [10]

- a) Write in brief parameters required for urban planning.
- b) What is planning? Discuss parameters required for national planning.
- c) "Political willingness play important role in planning" Justify the statement.

P.T.O.

Q4) Write short notes (Any two) [10]

- a) Developmental indices
- b) Advantage of environmental planning
- c) Socio-economic issues in planning.

SECTION - II

Q5) Solve the following. [10]

- a) "EIA is essential tool of planning for development" Comment the statement.
- b) "State pollution control boards play important role for protection of environment" Comment the statement.

Q6) Solve any two from the following. [10]

- a) "Environment and development are two side of same coin" Justify the statement.
- b) Enlist the national laws for protection of environment in India.
- c) What is solid waste? How you can plan for its disposal?

Q7) Solve any two from the following. [10]

- a) What is development? How you can sustain development? Explain with suitable examples.
- b) What is conservation? Write methods of conservation with suitable examples.
- c) "Indian Laws play important role in protection and conservation of environment" Comment the statement.

Q8) Write short notes (Any two) [10]

- a) National policies for environment.
- b) Natural resources and their rate of regeneration.
- c) Carrying capacity of Environment.



Total No. of Questions : 8]

SEAT No. :

P1346

[5437]-45

[Total No. of Pages : 2

M.Sc. (Optional)

ENVIRONMENTAL SCIENCE

ENV - 413 : Environmental Management System

(2008 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *All questions carry equal marks.*

SECTION - I

Q1) Answer any two of the following :

- a) How environmental designing is useful in development planning?
- b) What is important of valuation in LCA?
- c) What are the demerits of checklist methodology in EIA?

Q2) Answer any two of the following :

- a) Give the significance of Surveillance audit in EMS.
- b) Write in brief the principle and structure of ISO 14000.
- c) Discuss the significance of ISO 14000.

Q3) Attempt any two of the following :

- a) What are the Guidelines for Green Building?
- b) Explain the importance of PDCA in EMS.
- c) Discuss the economic benefits of EMS.

Q4) Write notes on any two of the following :

- a) Variants of LCA.
- b) Occupational health and safety.
- c) Safety Standards.

P.T.O.

SECTION - II

Q5) Solve any two of the following :

- a) Categories the solid waste and add a note on importance of organic content.
- b) What is MSW? Give its classification.
- c) What are the properties of solid waste?

Q6) Answer any two of the following :

- a) “Waste is Wealth” Justify the statement with an example.
- b) What are hazardous waste? Give the characteristic of hazardous waste.
- c) Write in short about disposal technique of MSW.

Q7) Explain in any two of the following :

- a) What is biomedical waste? Enlist the impact of biomedical waste.
- b) What are the criteria to identify different wastes?
- c) What is composting? Add a note on techniques in composting.

Q8) Write notes on any two of the following :

- a) Collection of solid waste.
- b) Hydrolysis.
- c) Management of biomedical waste.

