

Total No. of Questions :8]

SEAT No. :

P1724

[Total No. of Pages :3

[5230] - 11

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 101 : Environmental Geosciences

(2008 Pattern) (Semester - I) (Old)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

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

SECTION - I

Q1) Attempt any two of the following:

- a) What is pressure? Discuss the measurement of pressure.
- b) What is solar radiation? Explain the electro-magnetic spectrum in detail.
- c) Write a note on Jet Stream.

Q2) Write any two from the following:

- a) Define Environmental lapse rate. Explain the effects of lapse rate on atmospheric stability.
- b) Define wind. Explain the types of wind in detail.
- c) Give brief classification of rocks.

P.T.O.

- Q3)** a) Define atmosphere. Explain detail chemical composition of atmosphere.
- b) Explain cyclone in detail.
- c) What are green house gases? Explain in detail impact of GHG on environment.

Q4) Write short notes on any two:

- a) Atmospheric Moisture;
- b) Droughts;
- c) Heat budget of Earth.

SECTION - II

Q5) Attempt any two from the following:

- a) Explain the detail internal structure of Earth.
- b) Define weathering. Explain the weathering process in detail.
- c) Write an account on the effect's of trace metal on human health.

Q6) Write any two from the following:

- a) Explain Global water balance in detail.
- b) What is REE? Explain it's classification in detail.
- c) What are the factor's influencing the surface water characteristics.

Q7) Attempt any two from the following:

- a) What are geological hazards? Explain in detail.
- b) Discuss the origin & composition of seawater.
- c) Explain soil profile diagram in detail.

Q8) Write short notes on any two:

- a) Fluctuations in sea level.
- b) Hydrological cycle.
- c) Global warming potential.



Total No. of Questions :8]

SEAT No. :

P1725

[Total No. of Pages :2

[5230] - 12

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 answer books.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*
- 4) All questions carry equal marks.*
- 5) All questions are compulsory.*

SECTION-I

Q1) Answer any two:

- a) Briefly explain the carbon cycle with diagram.
- b) What is hydrogen bonding in biological system.
- c) How RNA synthesise in biological system.

Q2) Answer any two:

- a) Explain the carcinogenic effects of chromium.
- b) Classify the detergents with suitable examples.
- c) Write in brief the factors which influence mutation.

Q3) Attempt any two:

- a) Explain the types & Role of RNA in biological system.
- b) Sketch and lable the diagram of nitrogen cycle.
- c) What is biomagnification? Explain with examples.

P.T.O.

Q4) Write short notes (any two):

- a) Properties of lead.
- b) Role of DNA.
- c) DDT.

SECTION-II

Q5) Answer any two:

- a) Explain component of HPLC with diagram.
- b) What are the merits and demerits of XRF.
- c) Write in brief applications of chromatography.

Q6) Answer any two:

- a) What is carcinogenicity? Explain carcinogenic effect of organic compound.
- b) Explain application of isotop dilution method.
- c) How the plastic biodegrad in environment?

Q7) Attempt any two:

- a) Write principle and working of AAS.
- b) Briefly write the acid-base reaction with suitable examples.
- c) Explain the principle of Gibbs energy with examples.

Q8) Write short notes on (any two):

- a) Effect of aflatoxin.
- b) Primary structure of protein.
- c) Properties of water.

EEE

Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages :2

P1726

[5230] - 13

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 103 : Environmental Biology

(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) *Answers to the two sections should be written in separate books.*

SECTION - I

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

- a) Give a concise account of various characteristics of a population.
- b) Discuss the role of microorganisms in environmental conservation.
- c) Comment upon the models of energy flow in an ecosystem.

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

- a) What are biogeochemical cycles? How they help to maintain stable nutrient composition on earth.
- b) Give an account on tundra biomer.
- c) Discuss the process of ecological succession.

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

- a) Give an account on ecological status of forests in India.
- b) Explain with the help of a diagram sulphur cycle.
- c) Which are the issues involved in conservation of wetlands.

P.T.O.

- Q4)** Write short notes on any two **[10]**
- a) Microbes as antimicrobial agents.
 - b) Conservation of forests.
 - c) Ecotone and edge effect.

SECTION - II

- Q5)** Attempt any two from the following: **[10]**
- a) Which are the various criterias used in defining protected areas in India?
 - b) What are quarantine regulations?
 - c) What are the problems involved in conservation of biodiversity?

- Q6)** Answer any two from the following: **[10]**
- a) Explain the role of environmental biotechnology in biodiversity conservation.
 - b) Comment upon Indian biodiversity with reference as a megadiversity nation.
 - c) Discuss the role of marine ecosystem with reference to resource generation and climate regulation.

- Q7)** Attempt any two from the following: **[10]**
- a) Give an account on global environmental agreements.
 - b) Discuss the role of IUCN in conservation of biodiversity.
 - c) Explain the role of local communities in wildlife management.

- Q8)** Write short notes on any two **[10]**
- a) Wildlife protection act, 1972.
 - b) In-situ conservation.
 - c) RAMSAR convention.



Total No. of Questions : 4]

SEAT No. :

P1727

[5230]-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) Answer all questions.
- 2) Figures to the right indicate full marks.

SECTION-I

Q1) Solve any two from the following :

[20]

- a) Explain the following terms.
 - i) Quartile
 - ii) Population
 - iii) Class boundary
 - iv) Skewness
 - v) Histogram
- b) Compute the arithmetic mean & standard deviation for the following data.

No. of Leaves	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Plants	5	15	50	56	48	30	20

- c) Write properties of normal probability distribution If $x \sim N(0,1)$ compute $p[-1 < x < 1]$ and $p[1 < x < 1]$

Q2) Attempt any two :

[20]

- a) Calculate arithmetic mean, median & mode from the following data set.

Plant height (cm)	0-10	10-20	20-30	30-40	40-50	50-60
No. of varieties	6	10	25	30	20	10

P.T.O.

- b) What is kurtosis? State the types of kurtosis and draw the sketch of each.
- c) Compute correlation coefficient between you x .

Root length	11.6	8.5	3.6	12.6	6.8	7.7	13.0	9.6	10.2	11.2
Shoot length	9.2	6.3	2.9	10.6	5.9	5.1	13.3	7.6	8.7	10.6

SECTION-II

Q3) Attempt any two of the following : **[20]**

- a) Write the meaning of following terms.
- i) Degree of freedom.
 - ii) Type I & Type II error.
 - iii) Independent event
 - iv) Null hypothesis
 - v) Critical region.
- b) Explain method of computation for one way ANOVA.
- c) What is time series analysis? Explain the method of calculation of moving average.

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

- a) Discuss chi - square test for goodness of fit.
- b) Discuss applications of statistical models in Environmental sciences.
- c) Explain the procedure of 't' test for equality of means of two populations.



Total No. of Questions : 8]

SEAT No. :

P1728

[5230]-21

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV-201 : Environmental Economics

(Semester-II)

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) Answer any two of the following:

- a) What are the reasons for failure of market? Explain.
- b) Explain in brief how quality of environment is depends on economy.
- c) Enlist the problems related to design social cost.

Q2) Attempt any two of the following:

- a) Explain how economic instrument protect the environment.
- b) Explain in brief options for decrease the subsidies.
- c) “Valuation of resources is important in while making policies”. Explain in detail.

Q3) Answer any two of the following:

- a) How cost-benefit analysis help to audit the resources? Explain.
- b) What is non-renewable resources? Discuss in detail.
- c) “Environmental Policies” is not effective instrument to protect the environment”. Justify the statement

P.T.O.

Q4) Write short notes (any two):

- a) Problems in cost-benefit analysis.
- b) Exploitation of natural resources and economy.
- c) Externalities.

SECTION-II

Q5) Attempt any two from the following:

- a) What are the causes of climate change and add a note on impacts of climate change on human Environment.
- b) Enlist the various methods of studying economic growth.
- c) Explain sustainable strategic planning used for sustainable development of rural areas.

Q6) Justify the statement (any two):

- a) Environmental problems are solved by sustainable development.
- b) Carbon trading is effective tool for Environmental Management.
- c) Environmental Kuznet curve is significant indicator of resource utilization.

Q7) Attempt any two of the following:

- a) What are the different short term & long term impact of climate change.
- b) Why developing countries needs to promote programmes on non-renewable resources.
- c) Define sustainability indicators & their significance in policy instruments.

Q8) Write a note on (any two):

- a) Micro & Macro Level planning.
- b) UNEP.
- c) Social cost.



Total No. of Questions : 8]

SEAT No. :

P1729

[5230]-22

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

**ENV-202 : Water and Waste Water Engineering
(2008 Pattern) (Semester-II)**

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) *Figures to the right indicate full marks.*
- 4) *All questions carry equal marks.*

SECTION-I

Q1) Answer any two of the following:

- a) State the types of water demand. Explain any one in detail.
- b) Explain incremental increase method with example.
- c) What are the standard specifications for drinking water.

Q2) Attempt any two of the following:

- a) Discuss the term hardness. Elaborate one method of water softening.
- b) What are the common impurities found in natural water sources.
- c) Discuss the impact of growth & development on water use.

Q3) Answer any two of the following:

- a) Draw a neatly labelled diagram of sand filter & its components. Add a note on backwashing.
- b) What is the role of aeration in water treatment. Discuss one method.
- c) Explain the significance of odour removal. What are the methods used.

Q4) Write short notes on any two:

- a) Chlorination.
- b) Electrodialysis.
- c) Population forecasting.

P.T.O.

SECTION-II

Q5) Answer any two of the following:

- a) Distinguish between river standards & effluent standards.
- b) What is the importance of primary treatment of waste water? Describe any one unit operation.
- c) Calculate rate of sewage generation for a population of 50,000. Assume 100 lit. of water supplied per person per day.

Q6) Attempt any two of the following:

- a) Explain the importance of aeration in waste water treatment. Give different types of aeration.
- b) Why is it necessary to determine DO, BOD & COD in waste water treatment? How is COD estimated.
- c) Distinguish between aerobic & anaerobic processes.

Q7) Answer any two of the following:

- a) What are the characteristics of dairy waste water? Draw a flowsheet of dairy ETP.
- b) Explain the process of anaerobic digestion. Give different models.
- c) Write a note on application of biotechnology for waste treatment.

Q8) Write short notes on any two:

- a) Treatability studies.
- b) Cyanide removal.
- c) Grit Chamber.



Total No. of Questions :8]

SEAT No. :

P1730

[Total No. of Pages :2

[5230] - 23

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 203 : Environmental Pollution - I Water & Soil

(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) Attempt any two from the following:

- a) Write the importance of water quality standards.
- b) What are bioindicators of water pollution. Give examples.
- c) Write the consequences of water pollution.

Q2) Solve any two from the following:

- a) What are the consequences of pollution of coastal areas on biotic entities.
- b) Explain the biological oxygen demanding wastes & its impact on water quality.
- c) What is the impact of water pollution on the health of humans.

Q3) Attempt any two from the following:

- a) Write about differences between oligotrophic and Eutrophic waters.
- b) How you will restored entrophicated lentic water Ecosystem? Give the technical details.
- c) Elaborate on water quality parameters.

P.T.O.

Q4) Write short notes on any two from following:

- a) Biological magnification.
- b) Acid mine drainage.
- c) Pollution and its effect on mangroves.

SECTION - II

Q5) Attempt any two of the following:

- a) Explain the impacts of radioactive pollution.
- b) What are the objectives of soil quality monitoring.
- c) How excessive use of pesticides will affect the soil fertility. Explain in detail.

Q6) Solve any two of the following:

- a) Explain why crop rotation and increasing crop diversity reduce pest populations.
- b) Debate the following statement. All hazardous wastes should be recycled and reused to eliminate disposal.
- c) What are the sources of radiation in Environment. Explain in brief the effects of radiation.

Q7) Attempt any two of the following:

- a) Write the suitable example of restoration of land for soil conservation.
- b) What are the characteristics of municipal solid waste?
- c) "Municipal and Industrial solid waste are responsible for water and soil pollution". Justify the statement.

Q8) Write any two short notes:

- a) Decontamination of polluted sites.
- b) Scintillation counter.
- c) Biological controls.



Total No. of Questions : 8]

SEAT No. :

P1731

[Total No. of Pages : 2

[5230]-24

M.Sc. - I

ENVIRONMENTAL SCIENCE

ENV - 204 : Environmental Law, Ethics & Policy

(2008 Pattern) (Semester - II) (Old)

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 any two of the following. **[10]**

- a) Discuss the role of UN authorities in protection of global environment.
- b) Write an account on various judgements given by courts in favor of environment protection.
- c) Which efforts are made at international level to prevent ozone depletion and species conservation.

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

- a) What are the important provisions of water act, 1974?
- b) What is the need for environmental governance in India?
- c) Discuss the important provisions of motor vehicle act related with environment protection.

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

- a) Discuss the salient features of environment protection act.
- b) What are the objectives and penalties of antipollution acts?
- c) Discuss the role of various institutional mechanisms created under antipollution acts.

P.T.O.

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

- a) Rio conference.
- b) Factories Act.
- c) Panchayat Raj System.

SECTION-II

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

- a) Discuss the importance of environmental impact assessment process for developmental activities.
- b) What are the drawbacks involved in traditional evaluation of development?
- c) What are the important guidelines for disposal of municipal solid wastes?

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

- a) Discuss the salient features of national environmental policy.
- b) What is sustainable development? Discuss three pillars of it.
- c) How rate of utilization in development process affect the natural resources?

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

- a) Why ecological growth factor is an important aspect under sustainable development?
- b) What is environmental audit? What are the requirements for it under rule 14 of EPA, 1986?
- c) How carrying capacity of environment is an important consideration in development process?

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

- a) Cost Benefit Analysis.
- b) Natural Vs Manmade Growth.
- c) Survival Need of Mankind and conservation.



Total No. of Questions :8]

SEAT No. :

P1732

[Total No. of Pages :3

[5230] - 31

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) *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 are the major factors contributing to air pollution?
- b) Discuss the thermochemical & photochemical reactions in troposphere.
- c) How does dispersion of vehicular pollutants take place.

Q2) Attempt any two of the following:

- a) How do oceans regulate atmospheric CO₂ levels.
- b) Give the sources of green house gases and their effect on human health.
- c) What are the sources of aerosols? Write a note on their adverse impacts.

Q3) Answer any two of the following:

- a) Write down the principle causes of industrial pollution.
- b) Write a note on air pollution from thermal power plants.
- c) How does ozone layer act as a protective umbrella for earth.

P.T.O.

Q4) Write short notes on any two:

- a) Bhopal gas disaster.
- b) UVB radiation.
- c) Monitoring of SO_x.

SECTION - II

Q5) Answer any two of the following:

- a) Describe the structure & working of any air pollution control device.
- b) Give the principle of ESP and its components.
- c) What are the different strategies for air pollution control?

Q6) Attempt any two of the following:

- a) What are the steps involved in removing gases by adsorption? Give examples of common adsorbents.
- b) What are the mechanisms involved in working of wet scrubber? List the types of scrubbers.
- c) Which pollutants are suitable for removal by incineration? List the limitations of the process.

Q7) Answer any two:

- a) Write about the back ground & working of UNFCCC.
- b) Enlist the flexibility mechanisms of Kyoto Protocol. Explain one.
- c) How does carbon sequestration control climate change.

Q8) Write short notes on any two:

- a) Advantages & Limitations of fabric filters.
- b) Zoning of air pollution.
- c) Different types of inertial separators.



Total No. of Questions :8]

SEAT No. :

P1733

[Total No. of Pages :2

[5230] - 32

M.Sc.

ENVIRONMENTAL SCIENCE

ENV-302: EIA & Environmental Auditing

(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) *All questions carry equal marks.*
- 4) *All questions are compulsory.*

SECTION-I

Q1) Answer any two of the following:

- a) Write a note on the history of EIA.
- b) What are the 4 stages prescribed under EIA notification 2006 for EC?
- c) Describe the generic structure of an EIA report.

Q2) Answer any two of the following:

- a) Describe the environmental parameters to be studied for environmental baseline settings.
- b) Give the impacts of mining on environment.
- c) Explain in brief about the matrix methodology.

Q3) Attempt any two:

- a) List the advantages and limitations of public consultation.
- b) Discuss any two models used for prediction of air impact.
- c) Write about the importance of land use data in EIA.

P.T.O.

Q4) Write short notes on any two:

- a) Methods of EIA.
- b) Scoping.
- c) Geographical features for EIA.

SECTION-II

Q5) Predict the environmental impact of any two:

- a) Distillery industry.
- b) Housing project.
- c) Petrochemicals.

Q6) Answer any two of the following:

- a) Prepare a detailed EMP for a highway project.
- b) Write about environmental budgeting and its importance.
- c) Give the environmental inventory for a chemical industry.

Q7) Attempt any two of the following:

- a) Enlist the different types of environmental audits. Describe any one in detail.
- b) Give the structure of Environmental audit as per Rule 14.
- c) What is the concept of ISO14000?

Q8) Write short notes on any two:

- a) Solid Waste Audit
- b) Advantages of env audit.
- c) EMP for river valley project.

EEE

Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages :2

P1734

[5230] - 33

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 303 : Remote Sensing and GIS

(Semester - III) (2008 Pattern)

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 books.*

SECTION - I

Q1) Explain any two of the following:

- a) Data acquisition process in Remote Sensing.
- b) Stefan - Boltzman's law and its significance in Remote sensing.
- c) Global Positioning System (GPS).

Q2) Answer any two of the following:

- a) Enumerate the characters of vertical and oblique aerial photographs.
- b) Discuss about the factors controlling scale of aerial photographs?
- c) Explain how stereoscopic photography is accomplished.

Q3) Attempt any two of the following:

- a) Explain the difference between Active and Passive remote sensing systems and add a note on merits of Active system.
- b) Describe the operating principles of Multi-spectral scanners.
- c) Enumerate different photo-recognition elements and describe "tone" and "pattern" in details.

P.T.O.

Q4) Write notes on any two of the following:

- a) Salient features of Earth Observing Satellites.
- b) Applications of Remote sensing in LULC mapping.
- c) Supervised and unsupervised classification of images.

SECTION - II

Q5) Answer any two of the following:

- a) Draw a neat diagram showing components of GIS and explain them briefly.
- b) Discuss about the scales of measurement in GIS.
- c) Write a note on GIS categories.

Q6) Attempt any two of the following:

- a) Explain “attribute data” giving suitable examples.
- b) Briefly describe techniques of digitization.
- c) Briefly explain the stages of GIS data modelling.

Q7) Answer any two of the following:

- a) Compare the merits and demerits of vector and Raster data models.
- b) Explain how spatio-temporal data is represented in GIS.
- c) Discuss about data input methods in GIS.

Q8) Write notes on any two of the following:

- a) Synergy between RS and GIS.
- b) DTM generation.
- c) Applications of RS-GIS in Environmental studies.



Total No. of Questions : 8]

SEAT No. :

P1735

[5230]-34

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCES

ENV - 311 : Restoration Ecology (Optional)

(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 books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *All questions carry equal marks.*
- 4) *All questions are compulsory.*

SECTION-I

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

- a) Explain the basic ecological principles used in restoration.
- b) How restoration ecology plays important role in conservation.
- c) Describe the concept of bioremediation with its type.

Q2) Answer the following (Any 2). **[10]**

- a) What is in situ conservation? Explain the traditional methods of conservation.
- b) How ecological succession is helpful in restoration.
- c) Write the role of rhizosphere flora in soil decontamination.

Q3) Attempt the following (Any 2). **[10]**

- a) Describe the strategies of ecological succession.
- b) Explain the methods of alkaline soils.
- c) What are hydrocarbons ? How such sites can be restored?

Q4) Write notes on (any 2). **[10]**

- a) Role of microbes.
- b) Bioremediation of mine dumps.
- c) Problems of solid waste dumping sites.

P.T.O.

SECTION-II

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

- a) What are the purposes of area treatment.
- b) Elaborate the concept of watershed development in semi-urban areas.
- c) Mention the significance of ethanosilvicultural refugia.

Q6) Justify the statement (any 2). **[10]**

- a) Exotic species are the challenges to restoration activities.
- b) Organic fertilizers are significant for sustainable agriculture.
- c) Scaling up approach in watershed development is value addition for the project.

Q7) Write notes on (Any 2). **[10]**

- a) Self help groups.
- b) Current developments in watershed developments.
- c) Classification of agro-forestry systems.

Q8) Answer any two from the following. **[10]**

- a) Differentiate physical & hydrological characters of watershed.
- b) Mention the prospects of silviculture.
- c) What is the need of resource appraisal in watershed?



Total No. of Questions : 8]

SEAT No. :

P1736

[5230]-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 question 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 in detail aim and objectives of biodiversity.
- b) Explain the process of diversification at genetic and species level.
- c) Write a note on categorization of threatened species by IUCN.

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

- a) Give a detailed account of biodiversity with respect to ecosystem services.
- b) Write a note an assessment of biodiversity.
- c) Highlight the importance of Ramsar convention.

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

- a) Discuss in brief, international convention on biodiversity.
- b) Enlist, use and non-use values of biodiversity & describe them.
- c) Discuss the importance of protected areas in conservation of biodiversity.

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

- a) Evolutionary and taxonomic biodiversity.
- b) Domestication of plants and animals.
- c) F. A. O.

P.T.O.

SECTION-II

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

- a) How biotechnology adversely affects biodiversity?
- b) Give a detailed account of Indian biodiversity and compare it with global diversity.
- c) How traditional knowledge is useful for conservation of biodiversity?

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

- a) Discuss in detail the factors responsible for loss of diversity at species level.
- b) Define the term 'agro-biodiversity' and discuss its importance.
- c) Why monitoring and inventory of biodiversity is necessary?

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

- a) How national economy is supported by biodiversity?
- b) Write a note on role of educational institutions in conservation of biodiversity.
- c) Give a detailed account of role of endemic and introduced species in biodiversity of a particular area.

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

- a) Bio - privacy.
- b) Concepts of sustainable development.
- c) Seed bank and genebank.



Total No. of Questions : 8]

SEAT No. :

P1737

[5230]-41

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

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

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) *Figures to the right indicate full marks.*
- 4) *All questions carry equal marks.*

SECTION-I

Q1) Answer any two from the following:

- a) What are different parameters of safety in chemical industry.
- b) Describe the ways by which you protect environment from toxic components in store house.
- c) Give safety aspect related noise in industries.

Q2) Briefly explain the - (any two)

- a) Potential hazards in highway project.
- b) Salient features of ISO 18000.
- c) Risk identification.

Q3) Answer any two from the following:

- a) Explain the importance of LCA in ISO 14000 programme.
- b) What is importance of public participation in safety programme.
- c) Describe 'Fire triangle' and its components.

P.T.O.

Q4) Write short notes (any two):

- a) Factory act 1948.
- b) Role of management in safety programme.
- c) Handling and disposal of hazardous materials rules.

SECTION-II

Q5) Answer any two from the following:

- a) Explain the physiological effects of organic solvents.
- b) Classify toxic material on their properties and application.
- c) Explain the noise abatement programme.

Q6) Explain in brief (any two):

- a) Epidemics and their contaminants.
- b) Role of NGO in sanitation programme.
- c) Metabolic effects of lead (Pb) on fauna.

Q7) Answer any two from the following:

- a) Briefly explain the disaster management plan in chemical industry.
- b) Explain the role of WHO in health programme.
- c) What is ergonomics. Explain its importance in working environment.

Q8) Write short notes on (any two):

- a) Public participation in health programme.
- b) Mutagenicity.
- c) Chronic toxicity and safety regulations.



Total No. of Questions : 8]

SEAT No. :

P1738

[5230]-42

[Total No. of Pages : 2

M.Sc.

ENVIRONMENT SCIENCE

ENV-402 : Watershed Management

(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) Discuss the various objectives and consequences of a watershed management.
- b) Discuss in brief aerial and relief aspect of a watershed management.
- c) Discuss the different characteristics of land classes in land capability classification of a watershed.

Q2) Answer any two of the following:

- a) Describe about guidelines and data requirement in watershed resource appraisal.
- b) Describe various characteristics required in planning for land use and soil conservation in a watershed planning.
- c) Describe various parameters required in environment impact assessment of a watershed management.

Q3) Explain any two of the following:

- a) Explain the participatory rural appraisal and its incentives in watershed development.
- b) Explain the various monitoring parameters in a watershed.
- c) Explain different types and estimation of water erosion in a watershed management.

P.T.O.

Q4) Write notes on any two of the following:

- a) Role of Women in watershed management.
- b) Ground water-flow in a watershed.
- c) Mechanism and estimation of wind erosion in watershed.

SECTION-II

Q5) Discuss any two of the following:

- a) Discuss the mechanism of precipitation and infiltration in a watershed.
- b) Discuss how contour farming and strip cropping are suitable for a successive watershed programme.
- c) Discuss the various mechanical measures for water erosion control in a watershed.

Q6) Answer any two of the following:

- a) Describe in brief staggered and contour trenches as a conservation measure for non-aerable lands in a watershed.
- b) Describe the various agro-forestry objective and benefits in a watershed.
- c) Describe the different traditional methods used in storage and control of water in a watershed.

Q7) Explain any two of the following:

- a) Explain in brief dry land farming used in a watershed with a suitable example.
- b) Explain the objectives and their function in storage of water in a watershed.
- c) Explain the role of target groups and selection of indicators in evolution of watershed project.

Q8) Write notes on any two of the following:

- a) Ecosystem management challenges in evolution of watershed project.
- b) Energy plants Farming in a watershed.
- c) Watershed development programme in eastern Maharashtra.



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P1739

[5230] - 43

M.Sc.

ENVIRONMENTAL SCIENCES

ENV - 411 : Forestry and Habitat Management

(Optional) (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) *Figures to the right indicate full marks.*
- 4) *All questions carry equal marks.*
- 5) *All questions are compulsory.*

SECTION - I

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

- a) Describe major forest types of India with suitable examples.
- b) Discuss in detail, three silviculturally important species in India with economic importance.
- c) Explain types and methods of seed collection.

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

- a) Discuss in detail, about traditional and advance methods of silviculture.
- b) Describe the impact of human developmental activities on forest.
- c) How forests are helpful in conservation of water?

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

- a) Discuss advantages and limitations of In-situ and ex-situ conservation.
- b) Describe the methods of collection and processing of non-timber forest produces (NTFPs).
- c) Explain the scope and objectives of joint forest management.

P.T.O.

Q4) Write a short note on following (any two) **[10]**

- a) Forest working plan.
- b) Impact of mining activity on forests.
- c) Sampling methods of forest inventory.

SECTION - II

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

- a) Define forest management and discuss objectives of it.
- b) Discuss the methods and advantages of measuring diameter and height of trees.
- c) Explain with examples, the role of remote sensing in management of forests.

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

- a) Describe in detail common causes of forest fires.
- b) Explain the general principles of forest engineering and its objectives.
- c) Discuss in detail, about the history of legislation related to forests and its protection in India.

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

- a) Discuss the methods of transport of timber on land.
- b) Write in detail about fundamental principles of forest economics.
- c) Describe environmentally sound forest harvesting practices.

Q8) Write a short note on following (any two) **[10]**

- a) Chemical and biological control for forests protection.
- b) National forest policy 1988.
- c) Gums & resins.

Total No. of Questions : 8]

SEAT No. :

P1740

[Total No. of Pages :2

[5230] - 44

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 412 : Environmental Planning and Management

(Optional) (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) Solve any two of the following : **[10]**

- a) Discuss the adverse effect of lack of environmental planning.
- b) What is planning? Give its important in developmental projects.
- c) "Public Willingness play important role in development". Justify.

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

- a) Discuss in detail parameter required for environmental planning.
- b) "Natural resources are essential for development". Comment.
- c) What is planning? Write the concept of regional planning.

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

- a) Discuss problems associated with Rehabilitation in detail.
- b) What is willingness? Discuss the role of social willingness in planning.
- c) What is historical importance of planning?

P.T.O.

- Q4)** Write short notes on (Any two) [10]
- a) Problems associated with planning.
 - b) Socio-economic issues in planning.
 - c) Impact of planning.

SECTION - II

- Q5)** Solve any two of the following: [10]
- a) Write in brief methods of E/A.
 - b) How disposal of solid waste is achieved? Explain.
 - c) “Development gives problems to the environment”. Discuss.

- Q6)** Attempt any two of the following: [10]
- a) Write an essay on “Importance of Planning”.
 - b) Define sustainable developments with examples.
 - c) Write in brief socio-economic issue in planning.

- Q7)** Answer any two of the following: [10]
- a) Write in brief role of pollution control boards in protection of environment.
 - b) What is conservation? Discuss the methods of conservation.
 - c) Enlist the laws for protection of environment.

- Q8)** Write short notes on (any two) [10]
- a) Carrying capacity of environment.
 - b) Characteristic of MSW.
 - c) National Policies for environment.



Total No. of Questions : 8]

SEAT No. :

P1741

[5230]-45

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

ENV-413 : Environmental Management Systems

(Theory and Licensing)

(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.*

SECTION-I

Q1) Answer any two of the following:

- a) Define Environmental Management. What are its goals?
- b) What is sustainable development ? How is it achieved?
- c) What is the role of international standards in improvement of environmental quality.

Q2) Attempt any two of the following:

- a) Write about the Plan-Do-Check Act model of EMS & benefits of EMS.
- b) What are the two sub categories of ISO 14000 standards? List the standards included in these categories.
- c) What are the goals & purposes of EMS.

Q3) Answer any two of the following:

- a) What are the different variants of LCA? Explain with example.
- b) Give the principles of green building.
- c) Explain the significance of environmental design.

P.T.O.

Q4) Write short notes on any two:

- a) Environmental Audit.
- b) Resource conservation.
- c) Carrying capacity.

SECTION-II

Q5) Answer any two of the following:

- a) Give the source & type based classification of solid waste.
- b) Write a note on solid waste generation in India.
- c) Discuss the health impacts of solid waste.

Q6) Attempt any one of the following:

- a) Discuss the problems associated with solid waste management.
- b) Explain the significance of 3R principle in solid waste management.
- c) Draw a neatly labelled diagram of sanitary landfill.

Q7) Answer any two of the following:

- a) Describe the process of composting with advantages & limitations.
- b) What are the characteristics of hazardous wastes.
- c) What is biomedical waste & why is it significant?

Q8) Write short notes on:

- a) Transfer stations.
- b) Incineration.
- c) Colour coding for biomedical waste.

