

Total No. of Questions : 8]

SEAT No. :

P2742

[Total No. of Pages : 2

[5033] - 11

M.Sc. (Semester - I)

ENVIRONMENTAL SCIENCE

ENV - 101 : Environmental Geoscience

(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)** Attempt any two from the following :

- a) What is atmosphere? Explain theory of atmospheric evolution.
- b) What is Environmental lapse rate? Explain temperature inversion phenomenon.
- c) Give an account on REE.

**Q2)** Attempt any two of the following :

- a) Explain the electromagnetic spectrum in detail.
- b) Write a note on Global warming potential.
- c) Write a brief note on chemical composition of atmosphere.

**Q3)** Write any two from the following :

- a) What is adiabatic lapse rate? Discuss the effects of adiabatic lapse rate on atmospheric stability.
- b) What is wind? Comment on measurement of wind.
- c) Give an account on global water balance.

***P.T.O.***

**Q4)** Write short notes on any two :

- a) Factors affecting wind.
- b) Forms of condensation.
- c) Lightening.

### **SECTION - II**

**Q5)** Attempt any two from the following :

- a) What are minerals? Give detail classification of minerals.
- b) What is soil? Comment on soils of India.
- c) Explain Green house effect in detail.

**Q6)** Write any two from the following :

- a) Give an account on Geological hazards & mitigation strategies.
- b) What are the uses of trace metals for human being.
- c) Explain soil profile diagram in detail.

**Q7)** Attempt any two of the following :

- a) Write a detailed note on Geochemical cycle.
- b) Explain internal structure of earth in detail.
- c) Write a note on pressure measurement and distribution.

**Q8)** Write short notes on any two :

- a) Sea level rise.
- b) Igneous rocks.
- c) Classification of trace elements.



Total No. of Questions : 8]

SEAT No. :

P2743

[Total No. of Pages : 2

**[5033] - 12**  
**M.Sc. (Semester - I)**  
**ENVIRONMENTAL SCIENCE**  
**ENV - 102 : Environmental Chemistry**  
**(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) Figures to the right indicate full marks.*
- 4) All questions carry equal marks.*
- 5) All questions are compulsory.*

**SECTION - I**

**Q1)** Attempt any two of the following :

- a) Explain nitrogen cycle with neat labelled diagram.
- b) Explain hydrogen bonding in biological life.
- c) What are factors which affect mutation?

**Q2)** Answer any two of the following :

- a) Briefly write caecino-genic effects of alkali metals.
- b) How RNA is synthesized in biological life.
- c) What are radionuclides?

**Q3)** Answer the any two :

- a) Sketch neat labeled diagram of DNA and write its function in cell.
- b) Explain with examples microbiological degradation in nature.
- c) Write the effects of organic compound.

**Q4)** Write short notes any two :

- a) Photo sensitive additives.
- b) Non-ionic detergents.
- c) Properties of water.

**P.T.O.**

## SECTION - II

**Q5)** Answer any two :

- a) What are the merits and demerits of NAA.
- b) Explain the significance of component in HPLC.
- c) Write the properties of modified detergents.

**Q6)** Attempt any two :

- a) Sketch neat labbeled diagram of AAS.
- b) What is acute toxicity? Explain with examples.
- c) Define chronic toxicity with suitable examples.

**Q7)** Attempt any two :

- a) What are the applications of isotop dilution?
- b) Write in brief significance of solubility of gases in water.
- c) What are the effect of lead (pb) on flora?

**Q8)** Write short notes any two :

- a) Chemical equilibria.
- b) Hallow cathod lamp.
- c) Limitations of Ion exchange chromatography.



Total No. of Questions : 8]

SEAT No. :

P2744

[Total No. of Pages : 2

**[5033] - 13**  
**M.Sc. (Semester - I)**  
**ENVIRONMENTAL SCIENCE**  
**ENV - 103 : Environmental Biology**  
**(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)** Attempt any two of the following :

- a) What are biogeochemical cycles? Explain ecological significance of biogeochemical cycles.
- b) Write an account on development and evolution of ecosystems.
- c) Discuss in detail applications of environmental microbiology.

**Q2)** Attempt any two of the following :

- a) What are functional attributes of ecosystem?
- b) Which are the factors that influence on cultivation and growth of microorganisms.
- c) Explain the energy flow in ecosystem with suitable diagram.

**Q3)** Attempt any two of the following :

- a) Discuss important provisions to protect wetlands under RAMSAR convention.
- b) Write an account on classification of biomes and their characteristics.
- c) Which are various forest types observed in India?

**P.T.O.**

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

- a) Endemic species of India.
- b) Community Ecology.
- c) Ecological Significance of Wetlands.

### **SECTION - II**

**Q5)** Attempt any two of the following :

- a) Write an account on biodiversity of India.
- b) What are threatened species categories of IUCN?
- c) Discuss the applications of environmental biotechnology in conservation of species.

**Q6)** Attempt any two of the following :

- a) What are the issues involved in wildlife management in India?
- b) Write an account on protected areas network in India.
- c) What is marine diversity? Discuss the productivity and extent of marine diversity.

**Q7)** Attempt any two of the following :

- a) What are the salient features of wildlife protection acts?
- b) Discuss in detail on various global agreements carried out to protect biodiversity.
- c) What is the importance of local communities in wildlife management?

**Q8)** Attempt any two of the following :

- a) National forest policy.
- b) Tools for data collection in wildlife management.
- c) Projects for wildlife conservation in India.



Total No. of Questions : 4]

SEAT No. :

P2745

[Total No. of Pages : 2

[5033] - 14

M.Sc. (Semester - I)

ENVIRONMENTAL SCIENCE

ENV - 104 : Statistical & Research Methods

(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) *All questions carry equal marks.*
- 4) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

**SECTION - I**

**Q1)** Solve any two from the following :

**[20]**

- a) Explain in brief the following terms :
  - i) Sample
  - ii) Simple Random Sampling
  - iii) Scatter plot
  - iv) Kurtosis
  - v) Histogram
- b) Enlist measures of central tendency. Explain method of calculation of any one of them with suitable example.
- c) Calculate standard deviation for the following frequency distribution.

Class	5-15	15-25	25-35	35-45	45-55	55-65
F	8	10	12	15	8	7

**P.T.O.**

**Q2) Solve any two from the following :** **[20]**

- a) What is skewness? Add a note on types of skewness with suitable diagrams.
- b) Calculate arithmetic mean, median and mode for the following :

Class	0-10	10-20	20-30	30-40	40-50
F	8	14	19	17	12

- c) Calculate correlation coefficient and interpret your answer.

x	1	2	3	4	5	6	7	8	9
y	9	8	10	12	11	13	14	16	15

### **SECTION - II**

**Q3) Solve any two from the following :** **[20]**

- a) Explain method of computation of one way ANOVA.
- b) Write the meaning of the following terms :
  - i) Null hypothesis
  - ii) Independent Event
  - iii) Type II error
  - iv) Standard error
  - v) Level of significance
- c) Explain chi-square test for independence of attributes.

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

- a) Discuss applications of computer based modelling with suitable examples.
- b) What is time series analysis? Explain the method of moving average.
- c) Explain the procedure of 't' test for equality of means of two population. Add a note on applications of 't' test in environmental science.





Total No. of Questions : 8]

SEAT No. :

**P2746**

[Total No. of Pages : 2

**[5033] - 21**

**M.Sc.**

**ENVIRONMENTAL SCIENCE**

**ENV 201 - Environmental Economics**

**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) Answer to the two sections should be written in seperate 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)** Explain the obstacles and policy implementation in Environmental programmes. **[10]**

**Q2)** Justify any two : **[10]**

- a) Subsidies are essential for stabilization of environmental programme.
- b) Cultural aspects are important in bioresource conservation.
- c) Micro environmental policies are effective.

**Q3)** Write answer of any two from the following : **[10]**

- a) Explain the policies for perishable agricultural goods.
- b) How the climate change affect market failure.
- c) Explain the long term policy for open cost mining.

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

- a) Hazardous waste transport and disposal.
- b) Theory of public goods.
- c) Public participation.

**P.T.O.**

## SECTION - II

**Q5)** Elaborate the significance of knznd's curve with suitable examples. [10]

**Q6)** Justify any two : [10]

- a) Surface temperature is important in the EL-Nino effects.
- b) CDM is important for sustainable development.
- c) Environmental legislation may influences FD1 in India.

**Q7)** Write answer of any two : [10]

- a) What are the problems of population vulnerability.
- b) Explain the role of abiotic strees on bioresources.
- c) What is carbon credit? Explain its importance.

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

- a) Incentives and Subsidies.
- b) Migration of population.
- c) Kyoto Protocol.



Total No. of Questions : 8]

SEAT No. :

P2747

[Total No. of Pages : 2

[5033] - 22

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 202 : Water and Waste Water Engineering

(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)** Answer any two of the following :

- a) Discuss any one method of population forecasting.
- b) What is quality of water? Explain quality required for industrial purpose.
- c) Draw and label different economical feasible treatment units for water treatment.

**Q2)** Attempt any two of the following :

- a) What is filtration? Explain in detail pressure filter.
- b) What are the sources of water for drinking?
- c) Write in detail adverse impact of impurities on quality of water.

**Q3)** Answer any two of the following :

- a) What is hardness? How it is removed from water? Explain.
- b) Write in detail process of Reverse Osmosis.
- c) Compare between quality of groundwater & surface water.

**Q4)** Write short notes (any two) :

- a) Chlorination
- b) Aeration
- c) Sedimentation

**P.T.O.**

## SECTION - II

**Q5)** Answer any two of the following :

- a) Why is it important to treat sewage before disposal?
- b) What are the standards for disposal of sewage in inland surface waters?
- c) What is the significance of grit removal in waste water treatment. How is grit removed?

**Q6)** Attempt any two of the following :

- a) Describe the principle of dissolved air floatation.
- b) Draw a neatly labelled diagram of trickling filter and explain its working.
- c) Describe the process of anaerobic digestion. Which wastes should be treated by this process.

**Q7)** Answer any two of the following :

- a) Explain the working of dairy ETP with diagram.
- b) Differentiate between suspended and attached growth processes in biological treatment. Give examples.
- c) Write a note on treatment of distillery spentwash.

**Q8)** Write short notes on any two :

- a) Role of clarifier in activated sludge process.
- b) Anaerobic contact process.
- c) Root zone technology.



Total No. of Questions : 8]

SEAT No. :

**P2748**

[Total No. of Pages : 2

**[5033] - 23**

**M.Sc.**

**ENVIRONMENTAL SCIENCE**

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

*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 :

- a) What is water sampling? Add a note on instruments of sampling.
- b) How mining affects soil & water resources.
- c) Write a note on specifications to dispose sewage in sea.

**Q2)** Attempt any two from the following :

- a) Explain in brief process of eutrophication.
- b) Write a note on specification to discharge effluent on land for irrigation.
- c) Explain in brief types, sources & effects of ocean pollution.

**Q3)** Attempt any two from the following :

- a) Write a note on drinking water standards as per IS 10500.
- b) What is soil reclamation? Add a note on macro nutrients of soil.
- c) Write in brief health impact of water pollution on humanbeings.

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

- a) Physico chemical parameters of drinking water.
- b) Agricultural waste.
- c) Hazardous waste.

***P.T.O.***

## SECTION - II

**Q5)** Attempt any two of the following :

- a) Write a note on ICRP recommendation.
- b) Write a note on composting and its benefits.
- c) What are effects of waste disposal on farm crops?

**Q6)** Attempt any two from the following :

- a) What are effect of radiation on plants & animals.
- b) Write in brief effect of fly ash on agricultural soil.
- c) What are health effects of industrial waste on workers working in textile industry?

**Q7)** Attempt any two of the following :

- a) Write a note on conversion of waste to energy.
- b) Explain working of semiconductor detector.
- c) What are the methods to dispose heavy metals from solid waste.

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

- a) 3R principal.
- b) G.M. counter.
- c) Agricultural waste.



Total No. of Questions : 8]

SEAT No. :

P2749

[Total No. of Pages : 2

[5033] - 24

M.Sc. (Semester - II)

ENVIRONMENTAL SCIENCE

ENV - 204 : Environmental Law, Ethics and Policy

*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) Explain the role of various institutional mechanisms created under antipollution acts.
- b) What are the statutory provisions to protect environment in India?
- c) Give an account on outcome of Rio conference.

**Q2)** Answer any two of the following :

- a) Explain the important out comes of Cites.
- b) Discuss the role of united nations organisation to protect global environment.
- c) Give an account on hazardous waste management rules.

**Q3)** Answer any two of the following :

- a) What are the salient features of water act, 1974?
- b) Explain the role of courts in implementation of enviromental governance.
- c) Discuss the salient features of environment protection act.

**P.T.O.**

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

- a) Motor vehicle act.
- b) Nairobi declaration
- c) Riot 10

### SECTION - II

**Q5)** Answer any two of the following :

- a) What are the priorities associated in economic, social and environmental development in India?
- b) Explain the impact of developmental activities on environment.
- c) Differentiate between natural and manmade growth.

**Q6)** Answer any two of the following :

- a) Give an account on aspects involved in carrying capacity of environment.
- b) Explain how the rate of utilization and generation impact on environmental degradation.
- c) Define and explain the concept of sustainable development.

**Q7)** Answer any two of the following :

- a) What are the drawbacks involved in traditional evaluation of development?
- b) What are the important provisions under municipal solid waste management rules?
- c) Discuss the requirement for audit under EPA, 1986.

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

- a) Cost benefit analysis.
- b) Environmental sustainability.
- c) National policy on EIA.





Total No. of Questions : 8]

SEAT No. :

P2750

[Total No. of Pages : 2

[5033] - 31

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 301 : Air pollution and Climate Change

*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)** Attempt any two from the following :

- a) Explain the composition of air.
- b) What is global warming. add a note on GHG.
- c) What are the effects of  $\text{No}_x$  on flora.

**Q2)** Write any two from the following :

- a) Explain the importance of surface temperature in EL.Nino.
- b) What are the point sources of pollution in pulp industry?
- c) What is zoning of aerosols in atmosphere?

**Q3)** Solve any two from the following :

- a) Explain the formation of ozone layer in atmosphere.
- b) What are the preventive measures in agro based industries for air pollution management.
- c) Explain the La-Nina phenomenon.

**Q4)** Write short notes on any two :

- a) Cloud seeding
- b) Lead pollution in atmosphere.
- c) Dispersion of air pollutants.

**P.T.O.**

## SECTION - II

**Q5)** Attempt any two from the following :

- a) Explain the Null and Holding cyder.
- b) Briefly write the alternative fuels.
- c) Explain the principle of venturi scrubber.

**Q6)** Write any two from the following :

- a) Explain the role of UNFCCC in climate change programme.
- b) How CDM can help for sustainable development.
- c) Write the types of particulate matters.

**Q7)** Solve any two from the following :

- a) Explain the functioning and application of pulse jet filters.
- b) What is carbon trading?
- c) What is IPCC? Explain its functional areas.

**Q8)** Write short notes on any two :

- a) Disadvantages of ESP.
- b) Adsorption of gases.
- c) Carbon sequestration.



Total No. of Questions : 8]

SEAT No. :

**P2751**

[Total No. of Pages : 2

**[5033] - 32**

**M.Sc. (Semester - III)**

**ENVIRONMENTAL SCIENCE**

**ENV - 302 : EIA and Environmental Audit**

**(2008 Pattern)**

*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) How many EIA notifications sofar exercised in India. Explain categorization of projects with reference to latest EIA notification.
- b) Procedure of public hearing as per EIA notification.
- c) Detailed note on - the data collected under socio-economic environment.

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

- a) Elements of primary data while collecting baseline information for an industrial project such as steel industry.
- b) Objectives of 'National Environment Policy - 2006'.
- c) How an 'analysis of alternatives' is generally explained in an EIA report.

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

- a) Describe the procedure of prior environmental clearance with the help of stages involved in the process.
- b) Explain generic structure of an EIA report with reference to EIA notification - 2006.
- c) Design an environment management plan for chemical & fertilizer Industry.

***P.T.O.***

- Q4)** Write short notes on any two : **[10]**
- a) Three common terminologies of EIA process.
  - b) Scoping stage of 'environmental clearance' process.
  - c) Overlays method of an impact assessment.

### **SECTION - II**

- Q5)** Attempt any two from the following : **[10]**
- a) How will you audit pollution aspect for any industry? Explain with example.
  - b) Recommend measures for control, prevention & mitigation of air pollution from sugar industry.
  - c) Note on impact of mining/blasting activity on air & noise environment.

- Q6)** Answer any two from the following : **[10]**
- a) Considering the upcoming thermal power projects in coastal areas of Maharashtra; explain probable ecological impacts of the project.
  - b) Explain significance of ISO 14000 to an industry.
  - c) Describe any five impacts of housing / township development projects.

- Q7)** Attempt any two from the following : **[10]**
- a) What is your opinion about the public hearing procedure in the process of 'Environmental clearance', in India?
  - b) Explain an impact of petrochemical industry on social, cultural & economics aspects.
  - c) Significance of meteorological data in impact assessment.

- Q8)** Write short notes on any two : **[10]**
- a) Basic structure of an environmental audit.
  - b) Disposal audit.
  - c) Cost benefit analysis with reference to EIA project.



Total No. of Questions : 8]

SEAT No. :

**P2752**

[Total No. of Pages : 2

**[5033] - 33**  
**M.Sc. (Semester - III)**  
**ENVIRONMENTAL SCIENCE**  
**ENV 303 - Remote Sensing and GIS**  
**(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) Answer to the two sections should be written in seperate answer books.*

**SECTION - I**

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

- a) Explain the process of data acquisition in Remote Sensing.
- b) Explain the significance of particle theory in Remote Sensing.
- c) Discuss the energy matter interactions with the terrain.

**Q2)** Write notes on : (any two) **[10]**

- a) Raleigh Scattering.
- b) Elements of GPS.
- c) Photographic scale.

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

- a) Explain the difference between active and passive remote sensing with suitable examples.
- b) Describe the operating principles of across-track multi-spectral scanner.
- c) Give the applications of thermal imaging.

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

- a) Earth Resource Satellites.
- b) Applications of Remote Sensing in Forest cover study.
- c) Tone and texture as photo-recognition elements.

***P.T.O.***

## SECTION - II

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

- a) Enumerate different components of GIS and describe people component in detail.
- b) Compare the Raster and Vector data models.
- c) Describe the basic features used for presenting a map.

**Q6)** Write notes on (any two) : **[10]**

- a) Stages of GIS data modelling.
- b) Techniques of digitization.
- c) GIS work flow.

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

- a) Describe the components of DBMS.
- b) Explain Data Input Methods.
- c) Discuss the components of Geographic data quality.

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

- a) Format conversions.
- b) DTM generation.
- c) Raster Data for GIS.



Total No. of Questions : 8]

SEAT No. :

**P2753**

[Total No. of Pages : 2

**[5033] - 34**

**M.Sc.**

**ENVIRONMENTAL SCIENCE**

**ENV - 311 : Restoration Ecology**

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

**SECTION - I**

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

- a) Briefly explain the steps involved in restoration of mines.
- b) What is significance of ecological succession in ecosystem?
- c) What is the selection criteria for exotic species in restoration programme.

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

- a) Explain the problems associated with leachate from dumping site.
- b) Define biofiltration. Add a note on any one with labelled diagram.
- c) Write the steps involved in restoration of saline soil.

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

- a) What are the steps involved in wetland restoration?
- b) Differentiate between phytostabilization and phytoextraction.
- c) Classify biofertilizer. Add a note on Rhizobium biofertilizer.

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

- a) Bioscrubber
- b) Organic farming
- c) Blue-green algae

**P.T.O.**

## SECTION - II

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

- a) What are the advantages of agro-forestry?
- b) Explain the benefits of Genetically Modified Organisms (GMO) in restoration techniques.
- c) Explain the various Techniques used for soil conservation.

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

- a) What is the importance of resource appraisal in watershed.
- b) Explain the role of Gram Panchayat in watershed development.
- c) What are the advantages of roof-top rain harvesting?

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

- a) Explain the Gabbian and Gully plug structures used for water conservation.
- b) What are the steps involved in micro watershed practices.
- c) Write the importance of hydrological characteristics for watershed.

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

- a) Organic forming
- b) Area - treatment
- c) Bio fertilizer





Total No. of Questions : 8]

SEAT No. :

**P2754**

[Total No. of Pages : 2

**[5033] - 35**

**M.Sc. (Semester - III)**

**ENVIRONMENTAL SCIENCE (Optional)**

**ENV - 312 : Biodiversity & Conservation**

*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.*
- 5) All questions are compulsory.*

**SECTION - I**

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

- a) Define biodiversity. Describe the concept and scope of biodiversity science.
- b) What are various disciplines of biodiversity? Explain any four.
- c) Describe the regional patterns of distribution of biodiversity.

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

- a) What are introduced species? Explain the problems associated with suitable example.
- b) Describe the factors causing loss of species diversity.
- c) What are IUCN threatened species categories? Explain any four with suitable example.

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

- a) Describe various ecosystem services and their valuation.
- b) Explain "Species composition changes according to levels of biodiversity".
- c) What are the characteristics of biodiversity at genetic level?

***P.T.O.***

- Q4)** Write short notes on any two : **[10]**
- a) Capacity building for biodiversity monitoring.
  - b) Loss of biodiversity and economy.
  - c) UNEP.

**SECTION - II**

- Q5)** Answer any two from the following : **[10]**
- a) Write the details on organisations involved in financing biodiversity management.
  - b) Discuss the direct values of biodiversity.
  - c) Explain various sources and methods of data collection on biological diversity.

- Q6)** Attempt any two questions from the following : **[10]**
- a) Elaborate on role of media in biodiversity conservation.
  - b) What is biodiversity management? Explain any two significant movements of biodiversity in India.
  - c) Discuss various social approaches for conservation of indigenous biodiversity.

- Q7)** Justify the following sentences (any 2) : **[10]**
- a) Biodiversity can also be conserved at home.
  - b) Biodiversity act has limitations in its application.
  - c) Protection, conservation and restoration are different approaches in biodiversity management.

- Q8)** Write notes on (Any 2) : **[10]**
- a) Categories of wetlands as per RAMSAR
  - b) CITES
  - c) Design of National Park



Total No. of Questions : 8]

SEAT No. :

**P2755**

[Total No. of Pages : 2

**[5033] - 41**

**M.Sc.**

**ENVIRONMENTAL SCIENCE**

**ENV - 401 : Environmental Toxicology, Health & Safety**

*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)** Attempt any two from the following :

- a) What is toxic waste? Explain hazards associated with it.
- b) Write a note on industrial emission with reference to health effects and control measures.
- c) What is risk? Explain on site & off site risk identification.

**Q2)** Attempt any two from the following :

- a) What are potential health hazards in chemical industry?
- b) What are the effects of lead poisoning on health? Add note on sources of lead in water.
- c) Write a note on employee state insurance act.

**Q3)** Answer any two from the following :

- a) Write a note on salient features of ISO-18000.
- b) What is role of trade union in occupational health and safety.
- c) Write a note on employee state insurance act.

***P.T.O.***

**Q4)** Write short notes on any two :

- a) Life Cycle Assessment.
- b) Personal protective equipment.
- c) Ergonomics.

## **SECTION - II**

**Q5)** Answer any two from the following :

- a) Explain in brief potential health program in chemical industry.
- b) What is chronic toxicity? Add a note on metabolic effects of mercury on fauna.
- c) What is importance of awareness campaign in sanitation programme?

**Q6)** Attempt any two from the following :

- a) Explain in brief role of WHO in sanitation.
- b) What is biomagnification? Add a note on it with suitable example.
- c) Write in brief about anticancerous drugs.

**Q7)** Answer any two from following :

- a) What are the widespread effect of water borne diseases on human health?
- b) What is disaster management?
- c) Enlist at least any five carcinogenic compounds of organic nature.

**Q8)** Write short notes any two of the following :

- a) Biological war
- b) Fluorosis
- c) Dispersion of atmospheric gases



Total No. of Questions : 8]

SEAT No. :

**P2756**

[Total No. of Pages : 2

**[5033] - 42**

**M.Sc.**

**ENVIRONMENTAL SCIENCE**

**ENV - 402 : Watershed Management**

*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 from the following :

- a) What are the objectives of watershed programme?
- b) Explain the importance of aerial aspect in watershed management.
- c) What is importance of geological characteristics in watershed management?

**Q2)** Answer any two of the following :

- a) What is significance of resource appraisal in watershed?
- b) What are the main features incorporated in rural integrated watershed planning?
- c) What are the steps considered for soil conservation?

**Q3)** Answer any two of the following :

- a) What is the importance of EIA in watershed management programme?
- b) Which are the basic parameters considered in watershed management programme?
- c) Narrate the role of people's organisation in watershed development.

***P.T.O.***

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

- a) Evaporation
- b) Surface runoff
- c) Delineation

### **SECTION - II**

**Q5)** Answer any two of the following :

- a) Which factors influence the water erosion?
- b) How wind erosion is estimated watershed development area?
- c) Narrate the importance of strip cropping pattern in watershed development area.

**Q6)** Answer any two of the following :

- a) What are the steps involved in rehabilitation of mine land?
- b) Explain the role of gully control measures.
- c) Sketch a neat labelled diagram of contour trench in non-aerable land.

**Q7)** Answer any two of the following :

- a) Explain the role of horticultural practices in watershed programme.
- b) Which are traditional methods used for water harvesting?
- c) Briefly explain the importance of energy plant with suitable example.

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

- a) Sericulture practices
- b) Self help group
- c) State polices in WDP



Total No. of Questions : 8]

SEAT No. :

**P2757**

[Total No. of Pages : 2

**[5033] - 43**

**M.Sc. (Semester - IV)**

**ENVIRONMENTAL SCIENCE**

**ENV - 411 : Forestry and Habitat Management**

**(2008 Pattern) (Old Syllabous) (Optional)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

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

**SECTION - I**

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

- a) What is meant by forest inventory? Discuss its importance in forest management.
- b) Discuss role of national forest policy in protection of forests in India.
- c) Which are various ways of seed technology useful in conservation of forests.

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

- a) Discuss the importance of forests in relation with economic development.
- b) What is meant by social forestry? Explain its role in forest cover development.
- c) What are the current problems involved in protection of forest cover in India.

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

- a) Discuss the importance of non timber forest products.
- b) What is Silviculture? Discuss various methods involved in it.
- c) Discuss role of RS and GIS in conservation of forests.

***P.T.O.***

- Q4)** Write short notes on the following (any two) : **[10]**
- a) Joint forest management
  - b) Techniques in Tree improvement
  - c) Role of Tribals in Forest Protection

**SECTION - II**

- Q5)** Answer the following (any two) : **[10]**
- a) Discuss various legal provisions for protection of forests in India.
  - b) Write an account on biological methods to protect forest cover.
  - c) What is scope of forestry and habitat management? Discuss fundamental principles of it.

- Q6)** Answer the following (any two) : **[10]**
- a) What are the reasons behind degradation of forest cover in India.
  - b) Discuss the importance of forest genetic resources in future development of country.
  - c) Write an account on importance of integrated approach for forest management.

- Q7)** Answer the following (any two) : **[10]**
- a) Discuss fundamental principles of forest economics.
  - b) What is meant by ethnobotany? Explain its role in forest conservation.
  - c) Discuss various natural threats associated with forest cover.

- Q8)** Write short notes on the following (any two) : **[10]**
- a) Role of forests in soil conservation.
  - b) Forest mensuration.
  - c) Commercial logging.





Total No. of Questions : 8]

SEAT No. :

P2758

[Total No. of Pages : 2

[5033] - 44

M.Sc.

ENVIRONMENTAL SCIENCE

ENV 412 - Environmental Planning and Management

*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) "Public Willingness play important role in development". Justify the statement.
- b) Discuss in detail parameters required for planning.
- c) "Natural resources are essential for development". Comment.

**Q2)** Answer any two of the following :

- a) What is planning? Write the concept of regional planning.
- b) Write problem associated with Rehabilitation.
- c) Give significance of urban planning with examples.

**Q3)** Attempt any two of the following :

- a) Differentiate between political and social Willingness.
- b) 'Development is population dependant process' Discuss.
- c) What is historical importance of planning?

**Q4)** Write short notes (any two) :

- a) Problems associated with planning.
- b) Socio-economic issues in planning.
- c) Impact of planning.

**P.T.O.**

## SECTION - II

**Q5)** Answer any two of the following :

- a) “Development gives problems to the environment”. Discuss.
- b) Write in brief methods of EIA.
- c) How disposal of solid waste is achieved?

**Q6)** Answer any two of the following :

- a) Write an essay on the ‘importance of planning’ in the development.
- b) Highlight the need of sustainable development.
- c) Write in brief socio-economic issue in planning.

**Q7)** Attempt any two of the following :

- 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 any two :

- a) Carrying capacity of environment.
- b) Role of sustainable development.
- c) Retabilitation and Resettlement.



Total No. of Questions : 8]

SEAT No. :

**P2759**

[Total No. of Pages : 2

**[5033] - 45**

**M.Sc.**

**ENVIRONMENTAL SCIENCE**

**ENV 413 - Environmental Management Systems**

*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 is environmental management and how does it help in achieving sustainable development?
- b) Who are the different participants in the process of environmental management.
- c) Write a note on the international standards in environmental management.

**Q2)** Attempt any two of the following :

- a) What are the important factors in carrying out a life cycle Assessment?
- b) Describe the variants of LCA with examples.
- c) What are the environmental impacts to be considered in LCA.

**Q3)** Answer any two of the following :

- a) Explain the plan-do-check-act model of Environmental Management system.
- b) What is the importance of audit in EMS?
- c) Write about the different drivers for environmental design.

***P.T.O.***

**Q4)** Write short notes on (any two) :

- a) Importance of environmental design.
- b) Inventory analysis in LCA.
- c) Environmental policy statement.

## **SECTION - II**

**Q5)** Answer any two of the following :

- a) What are the types and characteristics of biomedical wastes?
- b) Give an account on municipal solid waste management.
- c) Which criteria are used in identification of hazardous waste sites?

**Q6)** Answer any two of the following :

- a) Give an account on various health effects caused by solid wastes.
- b) Discuss various engineering techniques used in disposal of solid wastes.
- c) Explain the various steps involved in pyrolysis.

**Q7)** Answer any two of the following :

- a) Explain the design structure and benefits of sanitary landfill sites.
- b) What are the issues involved in solid waste management?
- c) What are the positive and negative aspects involved in disposal of wastes at sea?

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

- a) 3R approach in MSW
- b) Incineration
- c) Management of hazardous wastes

