Total No. of Questions : 8] **[Total No. of Pages : 2**

P882

[3928] - 101
M.Sc. (Sem. - I)
ENVIRONMENTAL SCIENCE
ENV - 101 : Environmental Geosciences
(New) (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) ***All questions are compulsory.***

SECTION - I

Q1) Attempt any two of the following:

a) Describe the Sun and earth relationship governs the seasonal variation.

b) Discuss the role of atmospheric moisture in precipation.

c) Differentiate between Thunderstorm and cyclones.

Q2) Answer any two of the following:

a) Describe in brief about Jet Stream.

b) Write an brief account on atmospheric stability.

c) Draw and describe the structure of earths atmosphere.

Q3) Explain any two of the following:

a) Explain how drought condition are created.

b) Explain various factors effecting geostrophic wind and gradient wind.

c) Explain in brief the heat budget of earth.

Q4) Write notes on any two of the following:

a) Floods in India.

b) Forms of condensation.

c) Green house effect.

P.T.O.

SECTION - II

Q5) Attempt any two of the following:

a) Define mineral. Add a note on minerals and theirs classification.

b) Describe weathering and soil formations processes.

c) Write in brief the soils of India.

Q6) Answer any two of the following:

a) Give the origin and composition of Seawater.

b) Discuss the human use of surface ground water.

c) Describe the distribution and types of water resources present on earth surface.

Q7) Explain any two of the following:

a) Explain various factors that effects the mobility of trace elements.

b) Explain various mitigation measures require to redicue the volcanic hazards.

c) Explain the factors involved in formation of metamorphic rocks. Add a note on the metamorphism of limestone.

Q8) Write notes on any two of the following:

a) Internal structure of earth.

b) Hydrological cycle.

c) Earthquack.

☛ ☛ ☛

Total No. of Questions : 8] **[Total No. of Pages : 2**

P883

[3928] - 102

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 102 : Environmental Chemistry

(2008 Pattern) (New) (Sem. - 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) ***All questions carry equal marks.***
4) ***All questions are compulsory.***

SECTION - I

Q1) Attempt any two from the following:

a) Explain the biological function of Proteins.

b) Briefly explain the types of mutation.

c) Sketch a neat labelled diagram of phosphorus cyclic pathway in environment.

Q2) Solve any two from the following:

a) Explain biosynthesis of RNA in biological system.

b) Which are the factors influences the mutation?

c) Define Solute, Solvent and add a note on Solvent properties.

Q3) Answer any two from the following:

a) Classify the organic carcinogenic compounds.

b) How biological decaying of polymer occur in nature.

c) What is surfactants? Give various types of surfactants.

Q4) Write short notes on any two:

a) Classification of pesticides.

b) DDT degradation.

c) Sources and physical properties of lead in environment.

P.T.O.

SECTION - II

Q5) Attempt any two from the following:

a) What are the principle of isotope dilution technique.

b) Sketch a neat and labelled diagramme of colorimetry.

c) What are the limitations of Neutron activation analysis?

Q6) Solve any two from the following:

a) Narrate the merits and demerits of ion exchange chromatography.

b) Draw a structure of aflatoxin B_1.

c) Elucidate the role of ozone in stratosphere.

Q7) Write answer of any two from the following:

a) Explain the nature of current voltage obtained in polorographic studies.

b) What are the factors responsible for dissolution of gases in water?

c) What are the sources of oxides of carbon in carbonate system.

Q8) Write short notes on any two:

a) Radionucleides.

b) Principle of Gibb's energy.

c) Merits of XRD.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P884

[3928] - 103

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 103 : Environmental Biology

(New) (2008 Pattern) (Sem. - 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) ***All questions carry equal marks.***
4) ***All questions are compulsory.***

SECTION - I

Q1) Attempt any two of the following:

a) Define Ecology. What are biotic & abiotic elements of lake ecosystem?

b) Explain single channel energy flow model in ecosystem.

c) Briefly explain phosphorus cycle.

Q2) Answer any two of the following:

a) What are cultivation characteristics for bacteria?

b) Define biomes. Add a note on Taiga biome.

c) What is edge effect.

Q3) Justify any two of the following:

a) Role of microorganisms as biopesticide.

b) Functions and powers of National Biodiversity Authority.

c) Importance of forest as habitat.

Q4) Write short note on any two of the following:

a) Characteristics of population ecology.

b) Ecological niche.

c) Types of wetlands.

P.T.O.

SECTION - II

Q5) Attempt any two of the following:

a) What is difference between Wildlife sanctuary and National Park?

b) Define Ex-situ conservation with suitable example.

c) What are penalties prescribed for violation of provisions under Wildlife Protection Act 1972?

Q6) Answer any two of the following:

a) Define the terms : Endemic, Endangered and Extinct species.

b) What are factors influencing wildlife management?

c) What is role of local community in wildlife management?

Q7) Justify any two of the following:

a) Importance of Red Data Book.

b) Salient features of National Forest Policy.

c) Role of biotechnology in biodiversity conservation programme.

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

a) Functions of IUCN.

b) Criteria for selection of wetland sites.

c) Importance of Protected Area Network.

Total No. of Questions : 8] **[Total No. of Pages : 3**

P885

[3928] - 104

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 104 : Statistical and Research Methods

(2008 Pattern) (New) (Sem. - 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) ***All questions carry equal marks.***
4) ***All questions are compulsory.***

SECTION - I

Q1) Solve any two of the following:

a) The total numbers of eggs laid by insects at a species in a single batch were as follows:

7, 10, 13, 9, 10, 12, 9, 11, 8, 14, 10, 9, 11, 12, 13, 8, 7, 11, 11, 8.

Compute arithmatic mean, median and mode.

b) Write short note on histogram.

c) In an experiment the following observations are made regarding the number of earthworms found in different soil pH conditions. Calculate first quartile (Q_1) & third quartile (Q_3).

Soil pH	: 5.6-6.0	6.1-6.5	6.6-7.0	7.1-7.5	7.6-8.0
No.of Earthworms:	3	8	9	7	1

Q2) Answer any two of the following:

a) Calculate coefficient of variation for the following set of data showing the B.P. (Diastolic) of 10 persons.

125, 128, 122, 132, 126, 122, 114, 127, 119, 130.

b) Four cards are drawn at random from a well shuttled pack of 52 cards. Find the probability that

i) two cards are red and two are black. ii) one is king.

c) Explain "What is skewness"? Also explain different types of skewness.

P.T.O.

Q3) Answer any two of the following:

a) Compute correlation coefficient from the following data
$n = 10$, $\Sigma x = 197$, $\Sigma y = 62$, $\Sigma xy = 1565$, $\Sigma x^2 = 4599$, $\Sigma y^2 = 576$.

b) Define the following terms:
   i) sample space
   ii) event
   iii) mutually exclusive event
   iv) equally likely event
   v) independent event

c) Discuss the properties of regression coefficients.

Q4) Answer any two of the following:

a) The following results were obtained from records of leaf area x and chlorophyll content y, of σ plants in a rice field.

	x	y
Mean	2.90	667.3833
Variance	4.3039	138595

, $\Sigma(x-\bar{x})(y-\bar{y})=1885-46$

Find the regression equation of Y on X and also estimate chlorophyll content when leaf area is 2.75.

b) The probability that a person suffering from migraine headache will obtain relief with a particular drug is 0.9. Three randomly selected sufferers are given the drug. Find the probability that the number obtaining relief will be :
   i) Exactly Zero.
   ii) Exactly three.

c) Calculate standard deviation for the following distribution:

x:	10	20	30	40	50	60	70
f:	1	5	12	22	17	9	4

SECTION - II

Q5) Answer any two of the following:

a) Define the following:
   i) Null hypothesis
   ii) Alternative hypothesis
   iii) Type I error
   iv) Type II error
   v) Level of significance

b) In a certain population on average of 13 new cases of esophageal cancer are diagnosed each year. If the annual incidence of esophageal cancer follows a poisson distribution. Find the probability that in a given year the number of newly diagnosed cases will be

i) Exactly 10

ii) No more than 4.

c) Explain one way analysis of variance technique for testing the equality of several means.

Q6) Answer any two of the following:

a) What is time series? Explain the method of moving averages to estimate the trend values.

b) Define linear regression and explain the method of least squares of fitting of regression line of x on y.

c) Suppose the ages at time of onset of a certain disease are approximately normally distributed with mean of 11.5 years and standard deviation of 3 years. A child has just come down the disease. Find the probability that the child is between the ages of 8.5 and 14.5 years.

Q7) Answer any two of the following:

a) Calculate the median for the following frequency distribution.

Body weight:	below 20	21-40	41-60	61-80	81-100
No.of fishes:	1	9	32	16	7

b) Explain the 't test' for testing the significance of population mean.

c) Explain 'what is dispersion'. State the measures of dispersion.

Q8) Answer any two of the following:

a) Explain "simple random sampling with replacement and without replacement".

b) Explain the chisquare test for good ness of fit.

c) What is correlation? Explain the types of correlation.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P886

[3928] - 201
M.Sc. (Sem. - II)
ENVIRONMENTAL SCIENCE
ENV - 201 : Environmental Economics
(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) ***All questions are compulsory.***

SECTION - I

Q1) Answer any two from the following:

a) What are micro-foundation elements of environmental economics?

b) Discuss the need of economic instruments for environmental protection.

c) Enlist the interlinks between environment and economy.

Q2) Justify the statement (any two):

a) Incentives and subsidies are the major economic Instruments.

b) Understanding economic policies can play supportive role in environmental protection.

c) International comparisons are must in environmental economics.

Q3) Attempt the following questions (Any two):

a) Explain the theory of public good.

b) What is the impact of market failure?

c) Discuss the problem of Social cost.

Q4) Write notes on (Any two):

a) Externalities.

b) Design of Environmental Policy.

c) Challenges to environmental economics.

P.T.O.

SECTION - II

Q5) Answer any two from the following:

a) Explain the components of strategic planning in resource management.

b) What are the demerits of non renewable resources?

c) What are the factors responsible for migration of population?

Q6) Attempt any two from the following:

a) State the difference between incentives and Subsidies approach.

b) What is modified Kuznet's curve? Discuss its utility.

c) Explain the importance of carbon trading in economic development.

Q7) Answer any two from the following:

a) Explain the population vulnerability with suitable example.

b) State the difference between command and control approach.

c) 'Environmental education' is key factor in economic development, Justify.

Q8) Write short notes on any two:

a) FDI.

b) Macroplanning.

c) UNEP.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P887

[3928] - 202

M.Sc. (Sem. - II)

ENVIRONMENTAL SCIENCE

ENV - 202 : Water & Waste Water Engineering

(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) ***All questions are compulsory.***

SECTION - I

Q1) Answer any two of the following:

a) Explain the term water demand. Discuss the factors affecting water demand.

b) What are the impacts of growth, development and quality of life on water requirement?

c) What are the standard specifications for drinking water?

Q2) Answer any two of the following:

a) What are the common impurities found in natural source of water?

b) What are the functions of all four devices of clariflocculator?

c) Discuss the operational troubles of rapid gravity filters.

Q3) Answer any two of the following:

a) Determine the quantity of alum required for 13 MLD plant where 12 ppm dose is required. Also determine amount of CO_2 released per litre of water.

b) Write about the methods for removal of permanent hardness. Add a note on soda lime process.

c) Discuss the principle & theory of adsorption.

Q4) Write short notes on any two:

a) Ultrafiltration.

b) Iron removal.

c) Flow sheet of water treatment plant.

P.T.O.

SECTION - II

Q5) Answer any two of the following:

a) What are the objectives of wastewater treatment? Elaborate the significance of primary treatment.

b) What is the impact of quality of life on sewage quality and quantity?

c) Write about the importance of microorganisms in sewage treatment.

Q6) Answer any two of the following:

a) What is the role of screen chamber in an ETP? Write about the different types of screen.

b) Describe the treatment of sewage in a stabilization pond with the help of a neatly labelled diagram.

c) What is sludge volume index? Give its importance in biological wastewater treatment.

Q7) Answer any two of the following:

a) Differentiate between attached and suspended growth processes in biological treatment.

b) What are the selection criteria for treatment of high strength waste.

c) What are the methods for treatment and disposal of sludge? Add a note on sludge dewatering.

Q8) Write short notes on:

a) Root Zone Technology.

b) River standards and effluent standards.

c) Treatability index.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P888

[3928] - 203

M.Sc. ENVIRONMENTAL SCIENCE

ENV - 203 : Environmental Pollution : Water & Soil

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

SECTION - I

Q1) Attempt any two of the following:

a) What is water pollution? Write in brief sources of water pollution.

b) What is marine pollution? Discuss the effect of marine pollution.

c) Discuss the methods for sampling of water.

Q2) Answer any two of the following:

a) What is soil? Explain in brief soil profile.

b) What are the sources of soil pollution?

c) "Municipal sewage significantly contribute water pollution". Justify.

Q3) Attempt any two of the following:

a) Write in detail properties of ocean water.

b) What are specifications prescribed for disposal of sewage on soil?

c) Write in detail effect of water pollution on biosphere.

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

a) Characteristics of domestic waste.

b) Composite sampling.

c) Biological pollutant.

P.T.O.

SECTION - II

Q5) Attempt any two of the following:

a) What are the natural sources of radiation? Explain environmental radiation in detail.

b) Explain ICRP recommendations.

c) Draw schematic diagram of G.M. Counter and Explain its working.

Q6) Answer any two of the following:

a) Discuss method for disposal of heavy metals from solid waste.

b) What is mining? Explain effects of mining on soil.

c) Discuss effects of fly ash on soil.

Q7) Attempt any two of the following:

a) What is solid waste? Explain sources of solid waste in urban area.

b) What is 3R principle? Explain it with suitable examples.

c) Discuss "Disposal of solid waste by landfill technique".

Q8) Write short notes on any two:

a) Deterioration of soil.

b) Characteristics of solid waste.

c) Modes of radioactive decay.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P889

[3928] - 204

M.Sc. (Sem. - II)

ENVIRONMENTAL SCIENCE

ENV - 204 : Environmental Law, Ethics and Policy

(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) ***All questions are compulsory.***

SECTION - I

Q1) Answer any two of the following:

a) What was the outcome of Rio Conference?

b) What is the role of International law to control globle warming.

c) Write short notes on.

i) International law to prevention and control of acid rain.

ii) Fundamental duties of environment protection.

Q2) Answer any two of the following:

a) Explain the provision of the Indian penal code towards environment protection.

b) Explain the function of state pollution control board under the water act 1974.

c) Write short notes on:

i) Objective of the Environment Protection Act 1986.

ii) Reconciliation of Development Goals and Environmental Equity.

Q3) Answer any two of the following:

a) What are the requirements of an Environmental Audit?

b) What are the silent features of the National Environmental Policy 2006.

c) Write short notes on:

i) Offences and Penalties under Air Act.

ii) Ozon layer depletion and International legal sanctions.

P.T.O.

Q4) Answer any two of the following:

a) What are the legal guidelines for the disposal of Hazardous Waste?

b) Write about the International legal measures for the protection of Biodiversity.

c) Write short notes on:

i) Role of UN authorities in protection of environment.

ii) Protection of environment for survival of mankind.

SECTION - II

Q5) Answer any two of the following:

a) "The integration of economic, social and environmental sustainability should be goal of environment legislation". Comment.

b) How do you reconcile the environmental equity and justice with the rate of utilization and regeneration?

c) Write short notes on:

i) Cost benefit analysis.

ii) Ecological growth factor.

Q6) Answer any two of the following:

a) The directive principle of state policy also aim at environment protection. Explain.

b) Write about various parameter of sustainable development.

c) Write short notes on:

i) Natural virses manmade pollution.

ii) Drawback of traditional development pattern.

Q7) Answer any two of the following:

a) What are the features of convection on International Trade and Endangered Species?

b) What are the provision for protection of environment in the Panchayat Raj system?

c) Write in brief about fundamental rights to clean the environment.

Q8) Answer any two of the following:

a) Write in brief about Environment Impact Assessment.

b) Explain the Taj Trapezium case.

c) Comment upon the features of environmental law as regards pollution control.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P890

[3928] - 301

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 301 : Air Pollution and Climate Change

(New) (2008 Pattern) (Sem. - 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) Write about the different reactions in various layers of the atmosphere.

b) How will you classify air pollutants? Add a note on particulate pollutants.

c) Explain the carcinogenic effects of hydrocarbons.

Q2) Attempt any two of the following:

a) Write about the greenhouse effect and its role in global temperature change.

b) Explain the El Nino phenomenon and its effects.

c) What are the sources of aerosols? Write a note on the adverse effects of aerosols.

Q3) Answer any two of the following:

a) What are the sources of air pollution in the cement industry?

b) Write about alternative methods of controlling air pollution in fermentation industry.

c) Write a note on the formation of ozone and the mechanism of ozone depletion.

Q4) Write short notes on:

a) London Smog.

b) RSPM.

c) Alternative fuels.

P.T.O.

SECTION - II

Q5) Attempt any two of the following:

a) Write with examples about the control of air pollution by fuel selection.

b) What are the factors to be considered while selecting control equipment for particulate air pollutants.

c) Give the principle, advantages and disadvantages of cyclones.

Q6) Answer any two of the following:

a) List the different factors affecting the efficiency of absorption. Give examples of regenerative and non regenerative systems.

b) Write about the different mechanisms for cleaning fabric filters. Give details about pulse jet cleaning.

c) What are the different methods of incineration.

Q7) Attempt any two of the following:

a) What is the role of IPCC in global warming action plan?

b) How does the clean Development Mechanism address the issue of climate change.

c) Write about the different methods of carbon sequestration.

Q8) Write short notes on any two:

a) Characteristics of filter medium.

b) Certified emission reduction.

c) Adsorption isotherm.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P891

[3928] - 302

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 302 : EIA & Environmental Auditing

(New) (2008 Pattern) (Sem. - 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) Discuss how EIA is an effective tool for decision makers.

b) What are the salient features of the EIA notification 2006?

c) Explain the term socioeconomic environment in relation to EIA study.

Q2) Attempt any two of the following:

a) What are the different methods of impact analysis? Discuss any one in detail.

b) Write about the importance of baseline data collection in EIA.

c) What is environmental risk assessment?

Q3) Answer any two of the following:

a) Is public hearing mandatory for all EIA projects? Explain the procedure for the same.

b) What are the common errors found in EIA reports?

c) Write in brief about the steps involved in prediction and assessment of biological environment?

Q4) Write short notes on any two:

a) Meteorological data and ambientair quality.

b) Category A & Category B industries as per EIA notification.

c) Role of different stakeholders in EIA.

P.T.O.

SECTION - II

Q5) Predict the impact of any two of the following on air, water, soil and biological environment.

a) Sugar industry.

b) Petrochemical industry.

c) Dams (river valley project)

Q6) Answer any two of the following:

a) How are gardens and parks in urban areas to be planned in relation to Environmental management? Explain the importance with examples.

b) Prepare a detailed EMP for fertilizer industry.

c) What is the significance of environmental budgeting?

Q7) Attempt any two of the following:

a) What is environmental auditing? Also give its significance.

b) What are the requirement for Environmental audit under Rule 14 of EPA 1986.

c) Give the different types of environmental audits and the general methodology for audit.

Q8) Write short notes on any two:

a) Consumption audit.

b) Importance of planning in EIA.

c) ISO 14000.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P892

[3928] - 303

M.Sc. (Sem. - III)

ENVIRONMENTAL SCIENCE

ENV - 303 : Remote Sensing and GIS

(New) (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.***
5) ***All questions are compulsory.***

SECTION - I

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

a) What is RS? Write in brief its application.

b) What is aerial photography? Discuss any one method of scale determination of aerial photograph.

c) Differentiate between aerial photograph and satellite image. Write in brief which one is more supportive.

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

a) Discuss the role and importance of GIS in environmental study.

b) Write in brief application of RS in urban planning.

c) What is principle of RS? Write in detail passive RS.

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

a) What are the problems associated with aerial photography.

b) An aerial photograph has taken from aerial camera having focal length (F) 6 inch and having an average height (H) of camera 10,000 feet. Calculate the scale of photograph.

c) How aerial photography help to study urban environment?

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

a) Application of RS in marine study.

b) Types photography.

c) Relief displacement.

P.T.O.

SECTION - II

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

a) "GIS is scientific tool to gattern the information". Comment on the statement.

b) What is GIS? Write in brief requirement of GIS.

c) "GIS is more informative than RS". Justify the statement.

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

a) What is EMR? Write in detail its role in RS.

b) "Satellite is third eye of human to study the earth". Justify.

c) "GIS and RS play important role in environmental study". Comment the statement.

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

a) Write a note on Indian Satellite Program.

b) What step are required for data management in GIS?

c) "GIS, RS and aerial photography are integrated tools". Discuss

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

a) Terminology of GIS.

b) Energy matter interaction.

c) Importance of photographic scale.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P893

[3928] - 304

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 311 : Restoration Ecology

(Optional) (New) (2008 Pattern) (Sem. - 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) Define restoration ecology. Explain the concept of habitat restoration.

b) What are biotic and abiotic factors? Explain the interactions between then.

c) Describe the role of soil microflora in the restoration of degraded ecosystem.

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

a) Explain the concept of phytoremediation. Write a note on phytoremediation of sewage.

b) Describe the role of pioneer species in restoration.

c) What is decontamination of soil? Explain with the suitable example.

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

a) Elaborate on the restoration & management strategies of wetlands.

b) Discuss the methods used for restoration of saline soils.

c) What are the social-approaches for conservation of forest resources?

Q4) Write notes on any 2 of the following: **[10]**

a) Restoration of riverine ecosystem.

b) Bioscrubbers.

c) Constructed wetlands.

P.T.O.

SECTION - II

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

a) Discuss the significant hydrological characters in watershed development.

b) Mention the need for agroforestry.

c) Explain the method of roof water harvesting.

Q6) Justify the following statements (Any 2) **[10]**

a) Watershed development is not possible without planning.

b) Organic farming is a need of hour.

c) Horticulture is a significant economic alternative.

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

a) Land use mapping.

b) Scaling up of watershed.

c) Silviculture.

Q8) Answer any two of the following: **[10]**

a) Discuss the procedure of co-operative lift irrigation.

b) Elaborate on the problems associated with exotics.

c) Mention the need for resource appraisal.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P894

[3928] - 305

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 312 : Biodiversity and Conservation

(Optional) (New) (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) ***All questions are compulsory.***

SECTION - I

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

a) Describe the need for biodiversity assessment.

b) What are various disciplines of biodiversity? Describe them briefly.

c) Describe the process of diversification at species level.

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

a) Explain alpha, beta and gamma diversity.

b) Describe the spacial patterns of species diversity.

c) What are the values of biodiversity?

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

a) What are threatened species? Describe the threatened categories of species as per IUCN.

b) Explain capacity building.

c) Describe the role of WCMC, WWF, & IUCN in biodiversity management.

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

a) Genetic diversity.

b) Functional properties of biodiversity.

c) Demographic bottlenecks.

P.T.O.

SECTION - II

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

a) What are use & non-use values of biodiversity?

b) Mention the tools & techniques of data collection for diversity information.

c) Discuss the organizational.

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

a) Ramsar convention is effective in wetland conservation.

b) Traditional knowledge should have ownership.

c) Media plays significant role in biodiversity management.

Q7) Write notes on (Any two) **[10]**

a) Traditional resource rights.

b) Germplasm collection.

c) Aesthetic values of biodiversity.

Q8) Answer any two of the following: **[10]**

a) Mention the significance of environmental awareness.

b) What is institutional capacity development?

c) Elaborate on International laws on biodiversity.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P895

[3928] - 401

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 401 : Environmental Toxicology, Health & Safety

(2008 Pattern) (New) (Sem. 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 from the following:

a) Explain salient features of factory act, 1948.

b) What are the potential hazards in chemical industries.

c) Explain the importance of training and mock drills in safety programmes.

Q2) Attempt any two from the following:

a) Explain in detail the evaluation methods of toxicity.

b) Explain in detail the role of management in ISO - 18000.

c) What is risk? Explain on-site and off-site risk identification.

Q3) Answer any two from the following:

a) What is anticancer drug? Explain any one in detail.

b) Explain various types of mutagenesis.

c) What are the effect of mercury poisioning.

Q4) Write short note on any two from the following:

a) Safety committee.

b) Ergonomics.

c) Itai-Itai disease.

P.T.O.

SECTION - II

Q5) Answer any two of the following:

a) What are mitigation strategies for onsite risk identification?

b) Explain in brief potential health program in chemical industry.

c) What are regional health and safety policies.

Q6) Answer any two of the following:

a) Discuss psychological disorder of noise pollution.

b) Explain role of WHO in health programs.

c) Discuss preventive and curative measures for air borne diseases.

Q7) Attempt any two of the following:

a) What is the role of environmental education in controlling epidemic diseases?

b) Discuss role of NGO's in public awareness program.

c) Explain salient features of Water (Prevention & control of pollution) Act. 1974.

Q8) Write short notes any two of the following:

a) Disaster management.

b) Role of public health centre.

c) Biological weapons.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P896

[3928] - 402

M.Sc. (Sem. - IV)

ENVIRONMENTAL SCIENCE

ENV - 402 : Watershed Management

(New) (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) ***All questions are compulsory.***

SECTION - I

Q1) Attempt any two from the following:

a) Define watershed. Explain the benefits of Watershed Management.

b) Discuss the importance of geomorphological characteristics in delineation of watershed.

c) What are the objectives of Land Capability classification?

Q2) Answer any two of the following:

a) Explain the format for resource appraisal.

b) Write a note on planning for rural and integrated watershed development.

c) "Watershed Management is a method of improvement of environmental quality". Justify.

Q3) Attempt any two from the following:

a) Discuss the importance of participatory rural appraisal in watershed management.

b) Explain the concepts of precipitation, interception, infiltration as a hydrological process in watershed.

c) Explain the stages of monitoring, evaluation and follow up in watershed planning.

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

a) Aerial aspect and relief aspect.

b) Planning for landuse and soil conservation.

c) Hydrological cycle.

P.T.O.

SECTION - II

Q5) Attempt any two of the following:

a) State watershed development programme executed in the state.

b) Discuss the role of target groups in evalution of watershed projects.

c) Explain the livestock production in a watershed managed area.

Q6) Justify any two of the following:

a) Agro-forestry is a better practice in watershed.

b) Nala band are also used in storage and control of water.

c) Reclamation of ravine land is a conservation measure for non-aerable lands.

Q7) Answer any two of the following:

a) Describe biological measures for aerable land.

b) Explain various methods for estimation of Wind ersion.

c) Improvement of grassland for watershed management.

Q8) Write notes on any two of the following:

a) Types of wind ersion.

b) Vegetative water ways.

c) Contour trenches.

d) Conservation forestry.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P897

[3928] - 403
M.Sc.
ENVIRONMENTAL SCIENCE
ENV - 411 : Forestry & Habitat Management
(Optional) (2008 Pattern) (New) (Sem. - 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: **[10]**

a) Define forestry. Write concept and need of habitat management.

b) What is forest ecology? Explain the role of forests from ecological view point.

c) Describe the forest types of India.

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

a) Explain the general concept of tree improvement.

b) Justify the statement - "In the economy of nature, forests are of utmost importance".

c) What are forest resources? How forest working plans help in management and conservation of forests?

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

a) Describe the physiological factors that influences the vegetation.

b) Explain the silvicultural practices in specialized ecosystems like mangroves.

c) What are objectives of Agro forestry? Explain the scope and necessity of Agro forestry.

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

a) Participatory approach in social forestry.

b) Impacts of deforestation.

c) Methods and techniques of tree improvement.

P.T.O.

SECTION - II

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

a) Enlist the objectives of forest management system.

b) What do you mean by indirect utilization of forest resources?

c) Discuss the limitations of National Forest Policy, 1927.

Q6) Justify the statement (Any two): **[10]**

a) Remote sensing plays significant role in forest management.

b) Consumption pattern analysis is must in forest economics.

c) Storage facilities and market availability influences utilization of non timber forest produce.

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

a) What is valuation of forest goods and services?

b) Mention various methods to control forest damages.

c) Discuss the advantages of wildlife protection Act.

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

a) Forest working plan.

b) Shifting cultivation.

c) Joint forest management.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P898

[3928] - 404
M.Sc. (SEM. - IV)
ENVIRONMENTAL SCIENCE
ENV - 412 : Environmental Planning and Management
(New) (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) ***All questions are compulsory.***

SECTION - I

Q1) Answer any two of the following:

a) "Social willingness play important role in development". Justify the statement.

b) What is concept of planning? Discuss in brief parameters of planning.

c) "Without natural resources development is not possible". Comment the statement.

Q2) Attempt any two of the following:

a) What is regional planning? Write in brief parameters in regional planning.

b) Write important issue in brief for environmental planning.

c) What is urban planning? Discuss the parameters required for urban planning.

Q3) Answer any two of the following:

a) Write in brief parameters required for rural planning.

b) "Political willingness play important role in development". Justify the statement.

c) "Industrial development depends on natural resources". Justify.

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

a) Exploitation of natural resources.

b) Advantages of environmental planning.

c) Importance of National law in planning.

P.T.O.

SECTION - II

Q5) Answer any two of the following:

a) "Central pollution control board play important role in protection of environment". Comment the statement.

b) Write in brief socio-economic issues in planning.

c) "Disposal of solid waste doesn't require planning". Comment.

Q6) Attempt any two of the following:

a) "Development and Environment are two sides of same coin". Justify.

b) "EIA is essential before any developmental project". Comment.

c) What is biomedical waste? Write in brief its disposal.

Q7) Answer any two of the following:

a) What is national policy? How policy help to improve the environmental status? Discuss.

b) What is development? Write in brief parameters required for sustainable development.

c) What is conservation? How you can plan for conservation of water resource?

Q8) Write short on (any two) of the following:

a) Solid waste.

b) Natural resource and their rate of regeneration.

c) Public participation.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P899

[3928] - 405

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 413 : Environmental Management Systems

(Theory & Job Licensing) (2008 Pattern) (New)

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 sustainable development? What are the different approaches of environmental management to achieve sustainability?

b) Write about the participants in environmental management.

c) What are the two sub categories of ISO14000 standards? Enlist the various standards under ISO14000.

Q2) Attempt any two of the following:

a) What is Environmental Management System? How does it help in improving quality of environment?

b) What are the benefits and costs associated with EMS?

c) Write about the significance of documentation in EMS.

Q3) Answer any two of the following:

a) What is Life Cycle Assessment? Explain with a case study of LCA of a car.

b) What are the benefits and limitations of conducting LCA?

c) Write about the key principles of Environmental Design.

Q4) Write short notes on any two:

a) Ecolabelling.

b) System boundary.

c) Cradle to gate concept in LCA.

P.T.O.

SECTION - II

Q5) Answer any two of the following:

a) What is solid waste management? What are the functional elements of this system?

b) Write about the different properties of solid waste.

c) Write a note of the collection of solid waste in India.

Q6) Attempt any two of the following:

a) Explain the significance of recyling in solid waste management.

b) What are the various health risks associated with handling municipal solid waste?

c) What are the different techniques used in separating different components of solid waste? Elaborate any one.

Q7) Answer any two of the following:

a) Explain in brief the criteria used in identification of hazardous waste disposal site.

b) What are the advantages and limitations of using incineration for solid waste?

c) Which solid wastes are suitable for composting? What are the benefits?

Q8) Write short notes on any two:

a) Sanitary landfill.

b) Characteristics of hazardous waste.

c) Biomedical waste.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P900

[3928] - 41

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 401 : Advances in Pollution Control Technology (Old)

(2005 Pattern) (Sem. - IV)

Time :3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt not more than 5 questions of which at least 2 questions must be from each section.***
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) Explain various methods of aeration with suitable diagramme. Add a note on R.B.C. **[16]**

Q2) Attempt the following:

a) Explain the principle and theory of coagulation. **[8]**

b) Sketch a neat labelled diagramme of clari flocculator. **[8]**

Q3) Solve the following:

a) What is treatability index. Explain the importance in biological treatment. **[8]**

b) Explain various methods of sludge disposal. **[8]**

Q4) Write short notes on any two: **[16]**

a) Ultrafiltration.

b) FBR.

c) PACT.

P.T.O.

SECTION - II

Q5) Draw the flow chart of ETP for sugar industry and add note on principles of unit operations. **[16]**

Q6) a) Write a note on treatment of hazardous solid waste. **[8]**

b) Briefly explain treatment for spent wash with suitable flow sheet. **[8]**

Q7) Write in details waste water generation of canning industry and its treatment. **[16]**

Q8) Short Notes (Attempt any two)

a) UASB **[8]**

b) Chromium recovery from paper mill. **[8]**

c) Sanitory landfill.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P901

[3928] - 42

M.Sc.

ENVIRONMENTAL SCIENCE

ENV - 402 : Environmental Health & Safety

(Old) (2005 Pattern) (Sem. IV)

Time :3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt not more than 5 questions of which at least 2 questions must be from each section.***
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) Explain the legeslative measures for safety and health programme in industries. **[16]**

Q2) Attempt the following:

a) What are duties of safety officer and safety committees. **[8]**

b) Explain in brief the salient features of ISO - 18000. **[8]**

Q3) a) Explain various methods of toxicity evaluation. **[8]**

b) Classify the pesticides. Add a note on biomagnification of DDT. **[8]**

Q4) Write short notes on any two: **[16]**

a) Mutagenesis.

b) Pb-poisioning.

c) Risk analysis.

P.T.O.

SECTION - II

Q5) "Water is universal carrier for different diseases". Comment the statement and add a note on its protective measures. **[16]**

Q6) a) What is globle warming? Discuss the effect of globle warming. **[8]**

b) What is green house effect? Write its impact on biosphere. **[8]**

Q7) a) Enlist the problems associated with urban health due to sanitation. **[8]**

b) "World Health Organisation (WHO) play an important role in Public health". Comment the statement. **[8]**

Q8) Write short note (any two) of the following: **[16]**

a) Role of NGO in Environment Health.

b) Effect of temperature fluctuation on environment.

c) Widespred effect of bacteria and viruses.

Total No. of Questions : 8] **[Total No. of Pages : 2**

P902

[3928] - 43

M.Sc. ENVIRONMENTAL SCIENCE

ENV - 403 : Information Technology & Bioinformatics for Environmental Science (Old) (2005 Pattern) (Sem. - IV)

Time :3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt not more than 5 questions of which at least 2 questions must be from each section.***
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) Describe in brief the various process of data input and editing in GIS.

Q2) Discuss the application of remote sensing in Environmental Science.

Q3) Answer the following:

a) What is EMR? Explain the EMR interaction with earth surface.

b) Give a classification of Aerial photographs based on attitude of camera lens.

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

a) Component of GIS.

b) INSAT.

c) Relief displacement.

P.T.O.

SECTION - II

Q5) How to develope website by using HTML. Discuss with example.

Q6) a) Write various tools of bioinformatics for environmental science.

b) Write application of computer in environmental monitoring.

Q7) Discuss in detail use of internet for environmental awareness.

Q8) Short Notes (Attempt any two)

a) WAN.

b) Application of search engine.

c) Data base.