

Total No. of Questions : 8]

SEAT No. :

P3067

[4733] - 1001

[Total No. of Pages :2

M.Sc. (Environmental Science)
EVSC-101: Environmental Biology
(2013 Pattern) (Semester - I) (Credit System)

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions carry equal marks.*
- 2) Figures to the right indicate full marks.*
- 3) You are advised to attempt not more than 5 questions.*
- 4) Your answers will be valued as a whole.*

- Q1)** a) Explain structure and functions of Ecosystem in detail. **[4]**
- b) Write brief note on scope and developement of ecology. **[4]**
- c) Define synecology. **[2]**
- Q2)** a) What is a population? Give concise account of various characteristics of population. **[4]**
- b) Differentiate between 'r' selected and 'k' selected species with suitable examples. **[4]**
- c) Define ecads and ecotypes. **[2]**
- Q3)** a) What are ecological pyramids? Explain pyramid of energy in detail. **[4]**
- b) Write a brief note on influence of climatic factor on organisms. **[4]**
- c) Write short note Ecological niche. **[2]**

P.T.O.

- Q4)** a) What are biomes? Explain terrestrial biomes in detail. [5]
b) Discuss feeding behaviour of plants and animals giving suitable examples. [5]
- Q5)** a) Explain various factor's that affect growth of micro-organisms. [4]
b) Explain in brief, role of microbes in bio-remedial process. [4]
c) Write short note on micro-organisms and their association with plants. [2]
- Q6)** a) Write an essay on population growth and growth curves. [4]
b) Explain single channel energy flow model in detail. [4]
c) Define Vulnerable and extinct species. [2]
- Q7)** a) What is succession? Explain the process of succession in detail. [4]
b) Write short note on 'Energy fixation in ecosystem'. [4]
c) Define phytoplankton and zooplankton. [2]
- Q8)** a) What are biogeo-chemical cycles? Discuss phosphorus cycle in detail. [5]
b) Explain Heinrich walter's Biome climate diagram in detail. [5]



Total No. of Questions : 8]

SEAT No. :

P3068

[4733] - 1002

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 102 : Environmental Chemistry

(Credit System) (Semester - I) (2013 Pattern)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *All questions carry equal marks.*
- 4) *You are advised to attempt not more than 5 questions.*

- Q1)** a) Explain the biological function of RNA. [4]
b) Write the Principle and working of HPLC with suitable diagram. [4]
c) Structure DDT. [2]
- Q2)** a) What are the merit and demerits of NAA. [4]
b) Explain the sample preparation methods for gas chromatography. [4]
c) Lambert Beer's Law. Define. [2]
- Q3)** a) Explain the polarographic techniques in detail. [4]
b) What are the effects of lead in environment in brief. [4]
c) Define cationic surfactants. [2]
- Q4)** a) Explain the properties of modified detergents. [5]
b) Sketch a labelled diagram of colorimeter. [5]
- Q5)** a) Write a note on polymer decay. [4]
b) What are different biological function of enzyme in biodegradation. [4]
c) Define- mRNA. [2]

P.T.O.

- Q6)** a) Explain the role of tracer in isotope dilution methods. [4]
b) Sketch a neat labelled diagram of XRF. [4]
c) Define cationic surfactants. [2]
- Q7)** a) Explain the process of decomposition of synthetic polymer. [4]
b) Explain the methods for distribution of aflatoxins. [4]
c) Define mutation. [2]
- Q8)** a) Explain the biological impact of DDT in ecosystem. [5]
b) Write a note on UN guidelines for classification of waste. [5]



Total No. of Questions : 8]

SEAT No. :

P3069

[4733] - 1003

[Total No. of Pages :2

M.Sc. (Environmental Science)
EVSC-103: ENVIRONMENTAL GEOSCIENCES
(2013 Pattern Credit System) (Semester - I)

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagram must be drawn wherever necessary.*
- 2) Figures to the right indicate full marks.*
- 3) You are advised to attempt not more than 5 questions.*

Q1) a) Describe the internal structure of the earth. **[4]**

b) Give the characteristics of Metamorphic rocks. **[4]**

c) What is meant by “Rock cycle”. **[2]**

Q2) a) Explain the theory of continental drift. **[4]**

b) What are plates? Name the major tectonic plates. **[4]**

c) What is geological time scale? **[2]**

Q3) a) Explain the cycle of erosion. **[4]**

b) Describe any two depositional features with neat diagrams of glaciated region. **[4]**

c) Explain the term “Weathering” **[2]**

Q4) a) Draw a neat, labelled diagram of soil profile. **[5]**

b) Explain land capability classification. **[5]**

P.T.O.

- Q5)** a) Describe the types of aquifers. [4]
b) Discuss the effects of evapotranspiration on groundwater level changes. [4]
c) Enlist the rocks, forming aquifers. [2]
- Q6)** a) Discuss about properties of sea water. [4]
b) Explain how oceanic currents are developed. [4]
c) Enumerate the effects of sea-level changes. [2]
- Q7)** a) Discuss the effects of river erosion. [4]
b) Explain the process of desertification. [4]
c) What are Thunderstorms? [2]
- Q8)** a) Discuss the environmental impacts of river-valley projects. [5]
b) Discuss the causes and effects of slope-failures. [5]



Total No. of Questions : 8]

SEAT No. :

P3070

[4733] -1004

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 104: Environmental Statistics

(2013 Pattern) (Credit System) (Semester - I)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Attempt any FIVE questions.*
- 2) *All questions carry equal marks.*
- 3) *Figures to the right indicate full marks of the respective question.*
- 4) *Use of calculator is allowed.*
- 5) *Statistical tables and graph paper will be provided on request.*

Q1) Define the following terms:

[5 × 2 = 10]

- a) Random variable
- b) Parameter
- c) Bivariate data
- d) Sampling Unit
- e) Population

Q2) a) What are measures of central tendency? Discuss median and mode. **[5]**

b) Draw the less than ogive curve for the following data: **[5]**

Sr. No.	Class	Frequency
1	05-15	5
2	15-25	14
3	25-35	27
4	35-45	36
5	45-55	19
6	55-65	12
7	65-75	8

P.T.O.

- Q3)** a) Discuss the difference between standard deviation and coefficient of variation. [5]
 b) Compute standard deviation for the data given in Q2 b. [5]

- Q4)** a) Define the term correlation coefficient. State the formula and discuss in brief the interpretation from it. [5]
 b) Draw the scatter plot for the data given below and comment on it. [5]

X	15	18	19	45	85	95	105	107	99
Y	23	28	47	65	90	104	102	105	103

- Q5)** a) State the probability distribution of normal distribution. Also discuss its properties. [5]
 b) If $X \sim N(10, 64)$ Compute the probabilities $P[X > 12]$ and $P[-12 < X < 12]$ [5]

- Q6)** a) Discuss the procedure of fitting parabolic curve. [5]
 b) If equation of regression line is $Y = 0.8250 X + 20.2093$ then compute fitted values for data in Q4 b. [5]

- Q7)** a) Discuss Chi square test for goodness of fit. [5]
 b) Test whether attributes A and B are independent in the following contingency table. [5]

	A →	Present	Absent
B			
	Present	45	59
	Absent	75	63

- Q8)** a) Discuss in brief Population growth model. [5]
 b) Discuss in brief Cohort Projection. [5]



Total No. of Questions : 8]

SEAT No. :

P3071

[4733] - 2001

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC-201: Environmental Pollution & Control - I (Water & Soil)
(2013 New Pattern) (Credit System) (Semester - II)**

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.*
- 2) Figures to the right indicate full marks.*
- 3) All questions carry equal marks.*
- 4) You are advised to attempt not more than 5 questions.*

Q1) a) Write an account on importance of pollution control laws in water pollution monitoring . **[4]**

b) Write about the consequences of salt water intrusion on water environment. **[4]**

c) Define Eutrophication. **[2]**

Q2) a) Discuss various inorganic pollutants affecting the water quality. **[4]**

b) Explain various types of samples in water quality monitoring. **[4]**

c) What is artificial recharge. **[2]**

Q3) a) Give a brief account of consequences of water pollution on human health. **[4]**

b) Give an account of water pollution with respect to India as a developing country. **[4]**

c) Define Bioaccumulation. **[2]**

P.T.O.

- Q4)** a) Explain the process of restoring a eutrophic lake. [5]
b) Discuss about various economic effects of water pollution. [5]
- Q5)** a) Explain the difference between eutrophic and oligotrophic lake based on various parameters. [4]
b) Explain the process of restoration of a land degraded due to dumping of over burden. [4]
c) Give the examples of Pathogenic bacteria in water. [2]
- Q6)** a) Write in detail the effect of mining on marine ecosystem. [4]
b) Give a brief account of sanitary land fill. [4]
c) Brief where exactly the Geojutes are used. [2]
- Q7)** a) Why eutrophication is also called as 'Aeging of lakes'. [4]
b) Compare water pollution on with respect to lentic and lotic water ecosystems. [4]
c) Define Active Restoration. [2]
- Q8)** a) Write the types, effects and control measures of soil pollution. [5]
b) Explain the importance of water quality standards. [5]



Total No. of Questions : 8]

SEAT No. :

P3072

[4733] - 2002

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 202 : Biodiversity Forestry & Natural Resources

(Credit System) (2013 Pattern) (Semester - II)

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Figures to the right indicate full marks.*
- 2) All questions carry equal marks.*
- 3) You are advised to attempt not more than 5 questions.*
- 4) Your answers will be valued as a whole.*

- Q1)** a) Discuss the roles of animals in modern society and economy. [4]
b) Give a detail account of magnitude & distribution of Indian Biodiversity. [4]
c) Explain in short about in situ & exsitu conservation methods for plants. [2]
- Q2)** a) Discuss the value of bio-resources. [4]
b) Write a note on role of wild & domesticated gene-pool in human nutrition. [4]
c) Explain in brief traditional cultivars of crop species. [2]
- Q3)** a) Discuss the value of microbes in medicinal & Scientific research. [4]
b) Discuss different measures for conservation of biodiversity and its sustainable utilization. [4]
c) Explain the terms exploitation & sustainability. [2]
- Q4)** a) Discuss the role of plants in natural ecosystem and life support systems. [5]
b) Write a note on assessment of Biodiversity & its valuation. [5]

P.T.O.

- Q5)** a) Explain the role of eco-tourism. [4]
b) Discuss in detail the environmental cost of human conflict. [4]
c) Short note on WCS. [2]
- Q6)** a) Explain the significance of environment education at academic level. [4]
b) Discuss the value of ecosystems in national economy. [4]
c) Short note on Eco-development. [2]
- Q7)** a) Explain the role of traditional knowledge in forest conservation. [4]
b) Discuss different forest types of India. [4]
c) Write a short note on forest plantation. [2]
- Q8)** a) Discuss the Joint forest Management to explain community participation in forestry. [5]
b) Write a note on strategies for involving communities (urban & rural) in conservation of bio-resources. [5]



Total No. of Questions : 8]

SEAT No. :

P3073

[4733]-2003

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC-203 : Atmospheric Science

(2013 Pattern) (Semester-II) (Credit System)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *Your are advised to attempt not more than 5 questions.*

Q1) a) Describe the chemical characteristics of atmosphere. **[4]**

b) Why there is need to study atmosphere in Environmental Science. **[4]**

c) Define in brief climatology **[2]**

Q2) a) Discuss in detail laws of Radiation. **[4]**

b) Write in detail seasonal radiation distribution on earth. **[4]**

c) Explain heat budget of earth in brief. **[2]**

Q3) a) Why dry and wet temperature is measured? **[4]**

b) Write in brief distribution of temperature in atmosphere. **[4]**

c) What is Inversion? **[2]**

Q4) a) Write in brief distribution of pressure on the earth. **[4]**

b) Discuss in detail factors affecting the wind. **[4]**

c) What is geostrophic wind. **[2]**

P.T.O.

- Q5)** a) Write in detail any one theory of precipitation. [4]
b) What is Hadley cell? Explain. [4]
c) Write a note on El-Nino. [2]
- Q6)** a) What is atmospheric stability? [4]
b) Classify air masses and add a note on front. [4]
c) What is Lapse Rate. [2]
- Q7)** a) How global warming contribute to climate change? Explain. [4]
b) Write a note on ocean current and their effect. [4]
c) Discuss causes and consequence of lightning. [2]
- Q8)** a) Explain the significance of emission inventory. [4]
b) What is plume behavior? [4]
c) Write a note on air quality standards. [2]



Total No. of Questions : 8]

SEAT No. :

P3074

[4733] - 2004

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 204 : Remote Sensing and GIS

(Credit System) (2013 Pattern) (Semester - II)

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.*
- 2) Figures to the right indicate full marks.*
- 3) All questions carry equal marks.*
- 4) You are advised to attempt not more than 5 questions.*

- Q1)** a) Describe the interaction of EMR with the atmosphere. **[4]**
b) Explain the spectral signatures of different earth objects with their specific characteristics. **[4]**
c) Define active remote sensing with suitable example. **[2]**
- Q2)** a) Explain briefly about the satellite orbits. **[4]**
b) What is along the track scanning? Example with suitable example. **[4]**
c) List the steps involved in Remote sensing data acquisition. **[2]**
- Q3)** a) Write briefly on the Landsat series of satellites. **[4]**
b) Explain the wave theory of Electromagnetic energy. **[4]**
c) What is radiometric resolution. **[2]**
- Q4)** a) Explain the factors governing image interpretation. **[5]**
b) How to measure height on an aerial photograph. **[5]**

P.T.O.

- Q5)** a) What are the components of GIS. [4]
b) How map projections are classified. [4]
c) What is scale factor in map projection. [2]
- Q6)** a) Explain briefly about the vector data model. [4]
b) Enumerate the types of errors in GIS database. [4]
c) What is Triangulated Irregular Network (TIN). [2]
- Q7)** a) Explain the various Digital Elevation Models. [4]
b) What are the various types of overlays operations in GIS. [4]
c) Describe line in polygon operation. [2]
- Q8)** a) Explain the use of Remote Sensing and GIS in natural hazards and hazard management. [5]
b) Write a note on Remote sensing & GIS application forest cover mapping. [5]



Total No. of Questions : 8]

SEAT No. :

P3075

[4733] - 3001

[Total No. of Pages :2

M.Sc. (Environmental Science)

**EVSC-301: Environmental Impact Analysis & Environmental Audit
(2013 Pattern) (Semester - III) (Credit System)**

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions carry equal marks.*
- 2) Figures to the right indicate full marks.*
- 3) Your are advised to attempt nor more than 5 questions.*
- 4) Your answers will be valued as a whole.*

- Q1)** a) Discuss the defination & objectives of EIA. **[4]**
- b) With reference to EIA notification 2006, explain the four stages of environmental clearance process. **[4]**
- c) Discuss in brief, the benefits of EIA. **[2]**
- Q2)** a) How meteorological data is significant in EIA. **[4]**
- b) Discuss the advantages & disadvantages of public participation in EIA. **[4]**
- c) Write in brief about accreditation scheme for EIA consultants proposed by Quality council of India. **[2]**
- Q3)** a) What is base line data in case of EIA? Explain methodology for data collection. **[4]**
- b) Discuss the overlay and matrices method of impact assessment. **[4]**
- c) Write a note on secondary data & its sources. **[2]**

P.T.O.

- Q4)** a) Discuss the impact causing factors, in case of distillery project and propose preventive, controls & mitigation measures. [5]
- b) Which are significant factors for dam (river valley development) project? Explain how? [5]
- Q5)** a) Discuss environment management plans for air & noise aspect for highway projects. [4]
- b) Write a note on ecological studies conducted for collecting baseline data. [4]
- c) Write a short note on pollution audit. [2]
- Q6)** a) With reference to EIA notification 2006, discuss the generic structure of EIA report. [4]
- b) Explain pre & post activities of Environment audit. [4]
- c) Write a short note on ISO 14000. [2]
- Q7)** a) Write a note on consumption & solid waste audit. [4]
- b) Why environment audit is important? [4]
- c) Write in brief on audit tools. [2]
- Q8)** a) Prepare environment management plan for a songe iron industry. [5]
- b) Explain a general structure of disaster management plan. [5]



Total No. of Questions : 8]

SEAT No. :

P3076

[4733] - 3002

[Total No. of Pages :2

M.Sc. - II

ENVIRONMENTAL SCIENCE

**(EVSC 302) Environmental Pollution - II: Air, Noise and Radiation
(Credit System) (Semester - III) (2013 Pattern)**

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.*
- 2) Figures to the right indicate full marks.*
- 3) All questions carry equal marks.*
- 4) You are advised to attempt not more than 5 questions.*

- Q1)** a) What are the economic effects of air pollution?
b) What are the consequences of global warming?
c) Write the chemical composition of atmosphere.
- Q2)** a) What is acid rain? Explain its effects on living and non-living things.
b) Write about the noise standards given by CPCB.
c) What is half life period? Write any one example.
- Q3)** a) What is ozone depletion? Explain its effect on living organisms.
b) Explain various way of control of exhaust emissions.
c) Define the dB scale.
- Q4)** a) Write a note on semiconductor detector.
b) Explain working of wet scrubbers with suitable diagram.
- Q5)** a) Explain the health effects of gaseous air pollutants.
b) Explain how nuclear power plants causes air and radiation pollution.
c) Why stratosphere is important?

P.T.O.

- Q6)** a) Explain lead pollution with reference to vehicular exhaust.
- b) Explain preventive measures for industrial air pollution.
- c) What is meant by Acoustic trauma?

- Q7)** a) Explain how air pollution is controlled by Fuel selection.
- b) Explain the three miles disaster.
- c) What is meant by PTS, and TTS.

- Q8)** a) Write a note on 'alternative fuels for Fossil Fuels'.
- b) Write a note on ICRP recommendations.



Total No. of Questions : 8]

SEAT No. :

P3077

[4733] - 3003

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC-303: Water & Wastewater Technology

(2013 Pattern) (Credit system) (Semester - III)

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.*
- 2) Figures to the right indicate full marks.*
- 3) All questions carry equal marks.*
- 4) You are advised to attempt not more than 5 questions.*
- 5) Your answers will be valued as a whole.*

Q1) a) What is water demand and how is it calculated? **[4]**

b) Write about the need for water quality standards for different uses. **[4]**

c) Explain briefly the logistic method of population forecasting. **[2]**

Q2) a) Write about the different sources of water? What are the merits and demerits of using ground water. **[4]**

b) Give the standards for quality of drinking water. Explain the significance of chlorides & fluorides. **[4]**

c) What is the significance of design period? **[2]**

Q3) a) Write a note on the collection and pumping of water. **[4]**

b) Describe the principle of flocculation and its application in water treatment. **[4]**

c) What is the significance of iron removal from drinking water? **[2]**

P.T.O.

- Q4)** a) Draw a flowsheet for a conventional water treatment plant for a city. Write the functions of each unit. [5]
- b) Why is it necessary to remove hardness from water? What are the different methods used? Explain the sodalime process in detail. [5]
- Q5)** a) How does the quality of life affect the generation of sewage? [4]
- b) What is the objective of primary treatment of sewage? [4]
- c) Why is it essential to remove oil and grease from wastewater before secondary treatment? [2]
- Q6)** a) What are the impacts of disposal of untreated sewage on a water body?[4]
- b) Explain the working of dissolved air flotation unit. [4]
- c) Give the standards of disposal of treated water into inland surface water. [2]
- Q7)** a) What is the principle of biological treatment of wastewater? Write about suspended growth and attached growth processes. [4]
- b) What are the characteristics of dairy waste water? Give the flow chart of dairy ETP. [4]
- c) Write a short note on sludge drying beds. [2]
- Q8)** a) Write about the different models of anaerobic digestion. Explain any one in detail. [5]
- b) Explain the working of trickling filter with diagram. [5]



Total No. of Questions : 8]

SEAT No. :

P3078

[4733] - 3004

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC-304: Environmental Law, Ethics & Policy

(New 2013 Pattern) (Credit System)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *All questions carry equal marks.*
- 4) *You are advised to attempt not more than 5 questions.*

Q1) a) What are the limitations to successful implementation of environmental governance? **[4]**

b) Explain the role of constitution in environmental protection. **[4]**

c) State the articles 48A and 58(A). **[2]**

Q2) a) What are the salient features of Air Act, 1981? **[4]**

b) Discuss Biomedical Waste Management rules. **[4]**

c) Mention any four functions of Central Pollution Control Board. **[2]**

Q3) a) Discuss the important provisions of Wildlife (protection) Act, 1972. **[4]**

b) Explain the purpose and features of National Environmental Tribunal Act, 1995. **[4]**

c) What are the ways to handle municipal solid wastes? **[2]**

Q4) a) What are the important aspects to enhance and protect forests under National Forest Policy? **[5]**

b) Write an account on important provisions of National Water Policy. **[5]**

P.T.O.

- Q5)** a) Discuss the principles adopted under world summit on Sustainable Development. [4]
b) Explain the importance of cultural practices in conservation of environment. [4]
c) What is meant by 'Ecocentric View'? [2]
- Q6)** a) What are the various issues involved in environmental ethics? [4]
b) Write an account on Nairobi declaration. [4]
c) Write any two principles of Rio declaration. [2]
- Q7)** a) Discuss the basic pillars of sustainable development. [4]
b) Write an account on provisions under Biological Diversity Act, 2002. [4]
c) What is the importance of biodiversity in line with economic development? [2]
- Q8)** a) Explain the importance of environment protection in sustainable development. [5]
b) Discuss the legal steps taken by India to improve environmental conservation. [5]



Total No. of Questions : 8]

SEAT No. :

P3079

[4733] - 3005

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC-307: Man & Environmental

(2013 Course) (Semester - III) (Credit System) (Elective)

Time :3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Attempt any five questions.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right side indicate full marks.*

Q1) a) Describe the characters associated with Podobiomes in short. **[4]**

b) Discuss the various characteristic of Fresh Lotic Communities. **[4]**

c) What is an eastuary. **[2]**

Q2) a) Write an account on population density. **[4]**

b) Write in brief about “Primary of cities”. **[4]**

c) Define Mortality. **[2]**

Q3) a) Discuss the food loses effects on soil pollution. **[4]**

b) Distinguish between acute and chronic toxicity of hazardous waste. **[4]**

c) What is meant by Synergism. **[2]**

Q4) a) Justify “Floodplains and Wetland are often mismanaged in environmental protection”. **[5]**

P.T.O.

- b) Justify "It is important to provide recreational space in Urban planning". [5]

Q5) a) Discuss the concepts of limiting factors in Himalayan ecosystem. [4]

b) Describe some of the problems associated with modern landfills. [4]

c) State V.E.Shelford Law of tolerance. [2]

Q6) a) Explain the liabilities of development indices on policy makers. [4]

b) Explain the principles of Non-governmental Organisation in environmental Acts. [4]

c) What is an Eco-labeling. [2]

Q7) a) Give an account on ecological succession. [4]

b) Give the importance of environmental Journalism. [4]

c) Define Kutzner Curves. [2]

Q8) Write notes on the following:

a) Pollution Prevention Hierarchy. [5]

b) Thermal Pollution. [5]



Total No. of Questions : 8]

SEAT No. :

P3080

[4733] - 3006

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC-308: Environmental Education

(2013 Course) (Semester - III) (Elective) (Credit System)

Time :3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions carry equal marks.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right side indicate full marks.*
- 4) You are advised to attempt not more than 5 questions.*

Q1) a) How does ESD plays an important role in achiving sustainable development? **[4]**

b) What is the major difference between traditional and community based approaches of teaching? **[4]**

c) What is current ESD system in Indian schools. **[2]**

Q2) a) What are the objectives of 'Nai Taleem'? **[4]**

b) What are the aim and objectives of EE in India? **[4]**

c) Define CEPA. **[2]**

Q3) a) Discuss the linkage between 'Sarva Shiksha Abhiyan' and extra curricular activities at school level. **[4]**

b) Discuss the frame work of National curriculum of EE. **[4]**

c) How an school infrastructure and Habitat is benifited by linkage with sarva shiksha Abhiyan? **[2]**

P.T.O.

Q4) a) What are the policies and approaches to public awareness under EE?[5]
b) What is the difference between whole school and whole system approach towards EE? [5]

Q5) a) What is the major difference in pre and in service orientation for ESD?[4]
b) Discuss the Role of Mass Communication in EE and ESD. [4]
c) Define collaborative learning and action learning. [2]

Q6) Justify the statement.

a) “Public awareness plays a major role in environmental conservation”. [4]
b) Explain, how curricular and extra curricular approaches both play a vital role in educating students at school level. [4]
c) Define ESD. [2]

Q7) a) Enlist modern tools of teaching learning process and discuss the importance. [4]
b) How evaluation of EE and ESD programme is done? [4]
c) What is the difference between Experiencing nature and nature camps?[2]

Q8) a) Discuss in brief Role of Educator in EE and ESD. [5]
b) Enlist the policies to public awareness to attain sustainable development. [5]



Total No. of Questions : 8]

SEAT No. :

P3081

[4733] - 3007

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCES

EVSC-309: Environmental Biotechnology

(2013 Course) (Semester - III) (Credit System) (Elective)

Time :3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions carry equal marks.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right side indicate full marks.*
- 4) You are advised to attempt not more than 5 questions.*

Q1) Answer the following.

- a) Explain the role of environmental biotechnology in degradation of hydrocarbons.
- b) What are biopesticides? Explain its role in abatment of different pollution.
- c) Explain the term Bioleaching.

Q2) Answer the following.

- a) Explain the mechanism of biofuel production.
- b) Write a note on physiological & biochemical characteristics of microbial found.
- c) Write a note on root zone technology.

Q3) Answer the following.

- a) Explain the Nutrient medias of microbes with different types.

P.T.O.

- b) Explain the microbial adaptations to environmental conditions.
- c) Explain immobilization of enzyme.

Q4) Answer the following.

- a) Explain role of Environmental biotechnology in conservation of endangered plant species.
- b) Justify genetically modified plants are more resistance to pathogens & pests.

Q5) Answer the following.

- a) Define Bioremediation? Explain role of Bioremediation in abatement of water pollution.
- b) Write a note on Bioindicators in water pollution.
- c) Write a note on heavy metal degradation.

Q6) Answer the following.

- a) What is Biosafety? Write about biosafety regarding GMOS.
- b) Explain the different applications of Biosensors.
- c) Write a note on air pollution indicators.

Q7) Answer the following.

- a) Explain the different techniques used for Bacterial isolations.
- b) Explain the diversity of microorganism with special reference to prokaryotes & Eukaryotes.
- c) Gene pool & Gene Bank.

Q8) Answer the following.

- a) Discuss in detail biocomposting of agricultural waste.
- b) Write an account on water pollution indicator organism.



Total No. of Questions : 8]

SEAT No. :

P3082

[4733] - 3008

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC-310: Environmental Resource Monitoring
(2013 Course) (Semester - III) (Credit System) (Elective)**

Time :3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions carry equal marks.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right side indicate full marks.*
- 4) You are advised to attempt not more than 5 questions.*

Q1) a) What is Air Pollution? Give an account on site selection for air pollution studies. **[4]**

b) Write brief note on Electrostatic Precipitator. **[4]**

c) What are toxic elements? **[2]**

Q2) a) Describe the oxides of nitrogen and their effects with suitable examples. **[4]**

b) Explain the role of micronutrients in soil fertility. **[4]**

c) Write brief note on useful soil microbes. **[2]**

Q3) a) What is significance of Electric conductivity? State its need in analysis. **[4]**

b) What are different methods of determination of forest inventory. **[4]**

c) Write short note on soil carbon & it's significance. **[2]**

Q4) a) Comment on “wetlands are an important water resources”. **[5]**

b) Comment on “forest resources are depleting very rapidly”. **[5]**

P.T.O.

Q5) Write short notes on

- a) Wildlife census. [4]
- b) Extractable potassium & its role. [4]
- c) Soil profile. [2]

Q6) a) Give an account of handling and storage of soil samples. [4]

b) What is Noise? Describe the principle & working of sound level meter. [4]

c) Enlist various safety practices for monitoring of River pollution. [2]

Q7) a) Write an essay on gaseous stack monitoring in detail. [4]

b) What is climate and weather? Explain the various parameters involved in weather monitoring. [4]

c) Unit of measurement of Noise. [2]

Q8) a) Discuss the role of Remote sensing in wildlife monitoring with suitable examples. [5]

b) Elaborate methods of measurement of diameter and girth of trees. [5]



Total No. of Questions : 8]

SEAT No. :

P3083

[4733] - 4001

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC-401: Environmental Toxicology, Health and Safety
(2013 Pattern) (Semester - IV) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.*
- 2) Figures to the right indicate full marks.*
- 3) All questions carry equal marks.*
- 4) You are advised to attempt not more than 5 questions.*

Q1) a) What are various aspects of ISO 18000?

b) Explain EHS aspects involved in developmental projects with suitable example.

Q2)a) Explain methods used for risk management.

b) What are the sources of Arsenic and its compounds? Explain its toxicity.

Q3) a) Explain safety and health issues of any one industry.

b) What are the different methods used to assess toxicity.

Q4) a) What is meant by epidemic diseases? Explain any one waterborne epidemic disease.

b) Explain the terms

i) Accute toxicity

P.T.O.

- ii) LD_{50}
- iii) Hazard
- iv) Toxicology
- v) Xenobiotic

Q5) a) Explain any one airborne disease.

b) Explain chemical carcinogenesis with suitable example.

Q6) a) Explain role of WHO in public health and hygiene development.

b) Explain methods used for lethal toxicity studies.

Q7) a) Discuss role of NGO's in environmental sanitation.

b) Explain health effects of volatile organic compounds with suitable examples.

Q8) a) Write a note on safety standards and management systems.

b) Write a note on Hazardous waste management.



Total No. of Questions : 8]

SEAT No. :

P3084

[4733] - 4002

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSc - 402 : Restoration Ecology & Water Shed Management
(Credit System) (2013 Pattern) (Semester - IV)**

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.*
- 2) Figures to the right indicate full marks.*
- 3) All questions carry equal marks.*
- 4) You are advised to attempt not more than 5 questions.*

Q1) Answer the following:

- a) Define ecorestoration and explain why it is required.
- b) Explain methodology of investigation of surface springs.

Q2) Explain with suitable examples.

- a) Major functions/phenomena of ecology are useful in restoration activity.
- b) Watershed characterization.

Q3) Explain the significance of the following:

- a) Succession process in restoration.
- b) Waterbalance and hydrological equations.

Q4) Justify the statements:

- a) Restoration of mangrove habitat offers protection to coastal areas.
- b) Bunding is an important activity in watershed management.

P.T.O.

Q5) Explain in detail with significance:

- a) Check dam and gully plug.
- b) Wetlands and their restoration.

Q6) Answer the following:

- a) Discuss any two major problems associated with watershed management.
- b) Explain role of key stone species in restoration of degraded forest patches.

Q7) Attempt the following:

- a) Describe the restoration process of any open cast mining.
- b) Explain watershed functions in detail.

Q8) Write short notes on:

- a) In situ conservation.
- b) Live hedges.



Total No. of Questions : 8]

SEAT No. :

P3085

[4733]-4003

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC-403 : Waste and Hazardous Waste Management
(2013 Pattern) (Semester-IV) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *All questions carry equal marks.*
- 3) *You are advised to attempt not more than 5 questions.*

Q1) a) What are environmental effects of solid waste?

b) Write in detail characteristics of MSW.

Q2) a) '3R principle in solid waste management is important'. Discuss.

b) Differentiate between hazardous and non-hazardous waste.

Q3) a) What are the criteria in selection of landfill site?

b) Write the problems in handling of bio-medical waste.

Q4) a) Discuss the methods of composting in brief.

b) What are the advantages of SW disposal for environment?

Q5) a) Why medical waste handled differently than other waste?

b) What are the point and non-point sources of SW in textile industry.

Q6) a) Explain the process of pyrolysis in detail.

b) Write a note on government policy for SW management.

P.T.O.

- Q7)** a) What is E-waste? Give their sources in detail.
b) What is risk associated with radioactive waste?

Q8) Write a note on:

- a) Mining and solid waste.
b) Disposal of fly ash.

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Total No. of Questions : 8]

SEAT No. :

P3086

[4733] - 4004

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 404 : Renewable & Non-Renewable Energy

(2013 Pattern) (Credit System) (Semester - IV)

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.*
- 2) Figures to the right indicate full marks.*
- 3) All questions carry equal marks.*
- 4) You are advised to attempt not more than 5 questions.*

- Q1)** a) Explain the problems associated with coal Exploration, processing, Transportation & use.
b) Give an account on Biogas generation system.

- Q2)** a) Write a note on Energy sources & Their classification.
b) Explain briefly solar collector & concentrators.

- Q3)** a) Explain in brief condition required for Thermonuclear Fusion.
b) Enumerate the different main application of Solar Energy. Describe hot water supply system.

- Q4)** a) What are the main component of Flatplate collectors? Explain its working.
b) Explain indetail waste to energy conversion system.

- Q5)** a) Describe the main consideration in selecting site for wind energy generation.
b) What is mean by anaerobic digestion? Explain briefly factors affecting rate of biodegradation.

P.T.O.

- Q6)** a) What are the applications, advantages & disadvantages of Geothermal energy?
b) What is tidal energy? Explain Operational methods of utilization of tidal energy.
- Q7)** a) What is wave energy? Write a note on wave energy conversion by Floats.
b) Give an account on hydroelectricity.
- Q8)** Write short note:
a) Hazards related to hydropower.
b) Solar cooker.



Total No. of Questions : 8]

SEAT No. :

P3087

[4733] - 4005

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC-406: Forestry and Habitat Management
(2013 Pattern) (Semester - IV) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *You are advised to attempt not more than 5 questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

Q1) a) What is 'forest stand'? Explain structure and dynamics of forest stand.

b) Explain forest types in India.

Q2) a) Explain gene conservation by in situ method.

b) What are the objectives of social forestry.

Q3) a) Explain the role of forestry in soil conservation.

b) Explain in brief 'Volume estimation of stand'.

Q4) a) Give details of biotic components of forest ecosystem.

b) Explain silviculture practices in cold desert.

Q5) a) Explain the traditional methods of silviculture.

b) What are impacts of developmental projects on environment.

P.T.O.

Q6) a) Give an account of indirect services of forest.

b) Write a note on 'Forest Working plan'.

Q7) a) What are principles of forest Economics.

b) Enumerate Ecological factors influencing vegetation.

Q8) Write Note on:

a) Shifting cultivation

b) NTFPs.



Total No. of Questions : 8]

SEAT No. :

P3088

[4733] - 4006

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC-407: Environmental Economics

(2013 Pattern) (Semester - IV) (Elective) (Credit System)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Your are advised to attempt not more than 5 questions.*
- 2) All questions carry equal marks.*
- 3) Neat diagrams must be drawn wherever necessary.*

Q1) a) “Environment and Economy linked together”. Explain.

b) Define social-cost and discuss the problems associated with it with examples.

Q2) a) Discuss in detail functional role of economic instrument in protection of environment.

b) How incentives and subsidies decrease the quality of environment?

Q3) a) “Economy is dependant on exploitation of resources”. Justify.

b) Why cost-benefit analysis is important for protection of Environment?

Q4) a) Differentiate between renewable and non-renewable resources.

b) Discuss the need of Environmental policies for protection.

Q5) a) Write in brief note on concept and issue in sustainable development.

b) Enlist the various methods of environmental quality measurement.

P.T.O.

Q6) a) What is IPCC? Write its role in protection of environment.

b) Write a note on Kyoto protocol.

Q7) a) What is demand and supply? How it can be maintained?

b) What is sustainable development? How it is achieved?

Q8) Write Short Notes on:

a) Theory of public good.

b) Component of strategic planning.



Total No. of Questions : 8]

SEAT No. :

P3089

[4733] - 4007

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC-408: Sustainable Agriculture and Organic Farming
(2013 Pattern) (Semester - IV) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Your are advised to attempt not more than 5 questions.*
- 2) All questions carry equal marks.*
- 3) Neat diagrams must be drawn wherever necessary.*

Q1) a) Comment on traditional sustainable agricultural practices.

b) Discuss ‘post Green Revolution’ situation in India.

Q2) a) Discuss role of research and education in sustainable agriculture.

b) Explain biological methods of weed management.

Q3) a) Discuss principles of organic farming.

b) Comment on economics of sustainable agriculture.

Q4) a) Explain types of composting.

b) Explain the role of grazing herbivores in sustainable agriculture system.

Q5) a) What is integrated pest management? Explain it with suitable examples.

b) Discuss factors influencing vermicomposting process.

P.T.O.

- Q6)** a) Discuss concept of Extensive Livestock.
b) Comment on Integrated farming system model for wetlands.

- Q7)** a) What is permaculture?
b) Discuss the need of sustainable agriculture in India.

Q8) Write Short Notes on:

- a) Agroecology
b) Biofertilizers.



Total No. of Questions : 8]

SEAT No. :

P3090

[4733] - 4008

[Total No. of Pages :2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC-409: Wild life Management and Conservation
(2013 Pattern) (New Course) (Semester - IV) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Your are advised to attempt not more than 5 questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

Q1) a) What is the importance of wild flora and fauna in development of human society?

b) What is meant by in-situ conservation? Discuss with suitable examples.

Q2) a) What is ornithology? Why is it important to study?

b) Write an account on zoogeography of India.

Q3) a) What is population ecology? How is it important in wildlife studies?

b) Which are major rivers of India? Discuss biodiversity existing in it.

Q4) a) What are national parks? Discuss the measures taken by government to conserve biodiversity in it.

b) Discuss in detail on wild flora of India.

Q5) a) What are the various legal measures taken by India for management of wildlife?

b) Describe, why should wildlife of India be protected?

P.T.O.

Q6) a) Discuss biodiversity of any two protected areas of our country?

b) Describe coastal biodiversity of India.

Q7) a) Discuss the role of various authorities created under Indian and state forest services.

b) What are biodiversity registers? How are they useful in management of wild life?

Q8) a) Biodiversity of Indian Islands.

b) Mammalogy.

