

Total No. of Questions :8]

SEAT No. :

P1347

[5437]-101

[Total No. of Pages : 2

M.Sc

ENVIRONMENTAL SCIENCE

EVSC 101: Environmental Biology

(2013 Pattern) (Semester-I)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any five questions from the following.*
- 2) *Neat and labeled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following: [10]

- a) What is an 'ecosystem'? Explain components of ecosystem considering pond ecosystem as an example.
- b) What is 'Succession'? Discuss this process and explain its types.

Q2) Explain the following with suitable examples. [10]

- a) Impacts of anthropogenic activities on biosphere/ ecosystems.
- b) Ecological pyramids; food chain and food web.

Q3) Write a short note on following: [10]

- a) Mutualism including its subtypes.
- b) K-selected and r-selected species.

Q4) Discuss the following in detail. [10]

- a) Nitrogen cycle.
- b) Ecological niche and Edge effect.

Q5) Describe the following: [10]

- a) Territoriality and altruism.
- b) Parental care observed in animal kingdom

P.T.O.

Q6) Answer the following: **[10]**

- a) Describe the climatic features of grassland biome and comment on the characteristics of animals, observed in it.
- b) Describe in detail, ecological functions of wetlands.

Q7) Comment on following: **[10]**

- a) Intertidal zone of marine eco-system and mangrove forests observed in this region.
- b) Littoral and sub-littoral zone of lakes or ponds.

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

- a) Association of man & microbes
- b) Extremophilic microbes and their role in environment.



Total No. of Questions : 8]

SEAT No. :

P1348

[5437]-102

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 102 : Environmental Chemistry

(2013 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any Five Questions from the following.*
- 2) *Neat and labeled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following: **[10]**

- a) Draw neat labelled diagram of soil profile and add note on soil formation process.
- b) Explain the role of micro and macro nutrients in soil.

Q2) Draw a block diagram and explain its essential components of **[10]**

- a) HPLC
- b) Atomic absorption spectroscopy.

Q3) What are the merits and demerits of **[10]**

- a) Neutro activation analysis.
- b) x-ray diffraction analysis.

Q4) Explain the working principle of **[10]**

- a) Polarography.
- b) Gas chromatography.

Q5) Answer the following: **[10]**

- a) Explain the primary structure of proteins.
- b) What are the limitations of Ion exchange chromatography.

P.T.O.

Q6) Explain in brief: **[10]**

- a) The biomagnification of DDT in environment.
- b) What are the sources of lead in environment.

Q7) Explain in brief: **[10]**

- a) Cationic, anionic and nonionic detergents.
- b) Factors influencing mutation.

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

- a) UN classification of hazardous substances.
- b) Photosensitive additives.



Total No. of Questions : 8]

SEAT No. :

P1349

[Total No. of Pages : 2

[5437]-103

M. Sc.

ENVIRONMENTAL SCIENCE

EVSC - 103 : Essentials of Geosciences

(2013 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Solve any Five questions from the following.*
- 2) Neat and labelled diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*

Q1) Answer the following: **[10]**

- a) Define the terms “Weathering” and “Erosion”. Describe mechanical Weathering of rocks.
- b) Describe atleast two depositional and erosional features of river each.

Q2) Explain the causes and effects of : **[10]**

- a) Earthquakes
- b) Sea - floor Spreading

Q3) Describe the characteristic features of : **[10]**

- a) Sedimentary rocks.
- b) Glaciated regions

Q4) Write notes on : **[10]**

- a) Soil fertility
- b) Genesis of soil

P.T.O.

Q5) Explain the characteristic features of : **[10]**

- a) Drainage basin
- b) Unconfined aquifer

Q6) Describe the following : **[10]**

- a) Properties of sea water.
- b) Oceanic currents.

Q7) Discuss the causes and effects of : **[10]**

- a) Sea-level changes
- b) Land slides

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

- a) El.Nino
- b) Impact of Urbanization



Total No. of Questions : 8]

SEAT No. :

P1350

[5437]-104

[Total No. of Pages : 2

M.Sc. (Environmental Science)
EVSC-104 : ENVIRONMENTAL STATISTICS
(2013 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any Five questions from the following.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of statistical tables / Electronic pocket calculator is allowed.*
- 4) *All questions carry equal marks.*

Q1) Define the following terms with example

[5×2=10]

- a) Statistical unit
- b) Range
- c) Continuous random variable
- d) Quartiles
- e) Open end classes

Q2) a) What is classification? Explain the types of classification? What is usefulness of classification. **[5]**

- b) The Mean salary of 50 workes of a firm was found to be Rs. 2700. It was later discovered that the frequency of the class 1500-1700 was wrongly taken as 12 instead of 21, Find the correct mean salary. **[5]**

Q3) a) How to draw histogram in case of unequal class intervals? Present the following data by means of histogram. **[5]**

No. of Pods	No. of Plants
10-20	16
20-30	24
30-40	39
40-50	25
50-70	20
70-110	20
110-150	12

- b) What is dispersion? Define mean deviation and calculate coefficient of mean deviation about median for the data : 8, 15, 53, 19, 62, 7, 15, 95, 77. **[5]**

P.T.O.

- Q4)** a) What is meant by correlation? Describe the scatter diagram method to measure correlation? How it is used for interpretation of correlation?[5]
 b) Coefficient of variation of two series of 100 and 150 items are 60% and 80% with standard deviation 18 and 16 respectively. What are their means? [5]

- Q5)** a) What is measure of location? State different measure of location and give the requirements of good measures of central tendency. [5]
 b) Following table shows the distribution of 100 families. According to their expenditure. Calculate missing frequencies if Arithmetic mean is Rs.25. [5]

Expenditure(Rs)	0-10	10-20	20-30	30-40	40-50
No. of families	14	-	27	-	15

- Q6)** a) State the density function of Normal distribution, mention its important properties. [5]
 b) By using the following data, compute the Karl Pearson's coefficient of correlation.

$$\begin{array}{lll} \sum x = 250, & \sum y = 300, & \sum xy = 7,900, \\ \sum x^2 = 6,500, & \sum y^2 = 10,000, & N=10 \end{array} \quad [5]$$

- Q7)** a) Describe in detail the chi-square test of independence of the attributes[5]
 b) The weekly wages of 1000 workers are normally distributed with mean of Rs. 70 and with standard deviation of Rs. 5. Estimate the number of workers where weekly wages will be. (i) Between Rs. 70 and 72. (ii) More than Rs. 80. [5]

- Q8)** a) You are given $\bar{x} = 40$, $\bar{y} = 50$, $\sigma_x = 2.5$, $\sigma_y = 3.50$, and $\gamma_{xy} = 0.80$. obtain the equation of the regression lines. Also calculate the best estimate of X when Y=45 and that of Y when X=55. [5]
 b) Write note on - Population growth model. [5]



Total No. of Questions :8]

SEAT No. :

P1351

[5437]-201

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC - 201 : Environmental Pollution and Control-I: Water and Soil
(2013 Pattern) (Semester-II)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any five questions from the following.*
- 2) *Neat and labeled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following: [10]

- a) Explain the point and non point sources of water pollution.
- b) What are the guidelines for disposal of sewage on soil.

Q2) Answer the following: [10]

- a) What are the effect of open cast mining on soil quality.
- b) Explain the concept of integrated pest management in agriculture.

Q3) Answer the following: [10]

- a) What is ballast water? Explain its threat to marine life.
- b) Explain the various methods of water sampling.

Q4) Answer the following: [10]

- a) Explain the standards for drinking water, Agriculture water and domestic water.
- b) Explain in brief the effects of radiation on biological life.

Q5) Answer the following: [10]

- a) Discuss the disposal of solid waste by sanitary landfill techniques.
- b) What are the consequences of MSW site near to human settlement.

P.T.O.

Q6) Answer the following: [10]

- a) What is the impact of flood irrigation practices on soil quality.
- b) What is 3R principle. Explain with suitable example.

Q7) Answer the following: [10]

- a) Briefly explain the salient feature of water pollution act, 1974.
- b) What are the guidelines for disposal of Hazardous water management.

Q8) Write short notes on the following: [10]

- a) Modes of radioactive decay.
- b) Composite sampling.



Total No. of Questions : 8]

SEAT No. :

P1352

[5437]-202

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC - 202 : Biodiversity, Forestry and Natural Resources
(2013 Pattern) (Semester - II)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any five Questions from the following.*
- 2) *Neat and labeled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following : [10]

- a) Write in detail about magnitude and distribution of Indian & global biodiversity.
- b) Explain the usage pattern of marine bio-resources.

Q2) Answer the following : [10]

- a) Discuss in detail, the role of plants in life support system.
- b) How biodiversity assessment is carried out ?

Q3) Answer the following : [10]

- a) Explain the nature and intensity of different threats to biodiversity.
- b) Elaborate the role of animals in conservation of natural ecosystems .

Q4) Answer the following : [10]

- a) Write a note on traditional livestock.
- b) Write a note on 'In-situ' and Ex-situ conservation of plants.

Q5) Answer the following : [10]

- a) Explain the importance of micro-organisms in medicinal sciences.
- b) How technological & economic development have an impact on environment ?

P.T.O.

Q6) Answer the following. [10]

- a) Describe in detail, the growth of human population and its consequences.
- b) Explain the importance of Ramsar convention.

Q7) Answer the following . [10]

- a) Describe the major forest types of India.
- b) Discuss in details, the role of youth in conservation education and action.

Q8) Write short notes on the following : [10]

- a) Joint forest management.
- b) Working plan in forestry.



Total No. of Questions : 8]

SEAT No. :

P1353

[5437]-203

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE
EVSC-203 : Atmospheric Science
(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any five questions from the following.*
- 2) *Neat and labelled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following : **[10]**

- a) Which are the factors affecting distribution of Isolation?
- b) Briefly explain the flux of solar energy in the biosphere.

Q2) Write the answer of following : **[10]**

- a) Explain the vertical distribution of temperature with suitable diagram.
- b) Briefly explain urban heat island effect.

Q3) Answer the following : **[10]**

- a) Distinguish between geostrophic wind and gradient wind.
- b) Sketch a neat labelled diagram of hydrological cycle. Add a note on form of precipitation.

Q4) Briefly explain the following : **[10]**

- a) La-nina phenomenon and monsoon behavior.
- b) Human influence on radiation balance.

P.T.O.

Q5) Answer the following : **[10]**

- a) Differentiate between dry adiabatic lapse rate and moist adiabatic lapse rate.
- b) Explain characteristics and types of fronts.

Q6) Answer the following : **[10]**

- a) What are the factors responsible for drought condition?
- b) Briefly write the importance of emission inventory and pollutant dispersion.

Q7) Attempt the following : **[10]**

- a) Explain the genesis of hurricane formation and its movement.
- b) Briefly explain national air quality index and standards.

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

- a) Classification of Air masses.
- b) Indian monsoon.



Total No. of Questions : 8]

SEAT No. :

P1354

[5437]-204

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 204 : Remote Sensing and GIS

(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any five questions from the following.*
- 2) *Neat and labeled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following. **[10]**

- a) Explain the Interaction of EMR with Earth Surface.
- b) Explain the Elements of Photo Interpretation.

Q2) Answer the following. **[10]**

- a) Explain the different types of Resolution.
- b) Describe the Radiation laws.

Q3) Answer the following. **[10]**

- a) Explain the basic geometric characteristics of Aerial Photographs.
- b) Explain the Elements of GIS.

Q4) Answer the following. **[10]**

- a) Discuss the Nature and characteristics of vector data with suitable example.
- b) Discuss the Advantages of Raster data models.

Q5) Answer the following. **[10]**

- a) Explain the Hierarchical and Network data structure of Non-Spatial data.
- b) Explain digitizing errors detection.

P.T.O.

Q6) Answer the following. **[10]**

- a) Discuss the characteristics of WiFS sensors.
- b) Discuss the characteristics of polyconic projection.

Q7) Answer the following. **[10]**

- a) Discuss the History of GIS.
- b) Explain the Atmospheric Windows.

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

- a) Active and Passive Remote Sensing.
- b) Application of GIS.



Total No. of Questions :8]

SEAT No. :

P1355

[5437]-301

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any five questions from the following.*
- 2) *Neat and labeled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following: [10]

- a) Define Environmental Impact Assessment. What are the objectives of conducting an EIA.
- b) What are the salient features of EIA notification 2006?

Q2) Answer the following: [10]

- a) Write about the environmental parameters to be studied for establishing environmental baseline.
- b) Enlist the different methods of impact analysis. Discuss the overlays method in detail.

Q3) Answer the following: [10]

- a) Explain the advantages and disadvantages of public consultation in EIA.
- b) Write about the generic structure of an EIA report.

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

- a) Meteorological data and ambient air quality.
- b) Screening
- c) Environmental inventory.

P.T.O.

Q5) Predict the impact **[10]**

- a) Petrochemical industry - on air and water environment.
- b) Dam project - on ecology and socioeconomy.

Q6) Answer the following: **[10]**

- a) What are the criteria for selecting appropriate procedure for EMP? How does environmental budgeting help in EMP?
- b) Explain with case study 'Sugar factory is backbone of rural economy.'

Q7) Answer the following: **[10]**

- a) What are the different types of environmental audit? Explain any one in detail.
- b) Explain the concept of ISO 14,000. Add a note of audits as per ISO 14,000.

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

- a) Solid waste audit.
- b) Importance of planning in EIA
- c) EMP for fertilizer industry.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P1356

[5437]-302

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC - 302 : Environmental Pollution II : Air, Noise & Radiation
(2013 Pattern) (Semeter - III)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Solve any Five questions from the following.*
- 2) Neat and labeled diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*

Q1) Answer the following: [10]

- a) What is the greenhouse effect? How does it impact climate change?
- b) Write a note on the chemical composition of the atmosphere.

Q2) Answer the following: [10]

- a) What is air pollution? Give the sources and impacts on human health.
- b) Explain the strategies for controlling vehicular pollution.

Q3) Answer the following: [10]

- a) Write a note on air pollution from thermal power plants and its control.
- b) Describe the method for monitoring of SO_x.

Q4) Answer the following: [10]

- a) How can fuel selection help to control air pollution?
- b) Explain the structure and working of an air pollution control equipment working on centrifugal separation.

P.T.O.

Q5) Answer the following: **[10]**

- a) Enlist the methods used for controlling gaseous pollutants. Explain any one in detail.
- b) Write about the different types of wet scrubbers.

Q6) Answer the following: **[10]**

- a) Write about the health hazards associated with radiation.
- b) Define half life and enlist the units of radio activity measurement.

Q7) Answer the following: **[10]**

- a) Define noise. What are the health impacts of noise.
- b) How is noise controlled by design? Explain with example.

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

- a) Source Path Reciever concept.
- b) Los Angeles smog.
- c) Components of ESP.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P1357

[5437]-303

M. Sc.

ENVIRONMENTAL SCIENCE

EVSC - 303 : Water and Waste Water Technology

(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any Five questions from the following.*
- 2) *Neat and labelled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following:

[10]

- a) Importance of forecasting population in water treatment plant & explain logistic method and graphical projection method.
- b) Write down specification for drinking water quality by Bureau of Indian standards & World Health Organization.

Q2) Answer the following :

[10]

- a) Explain types of solids in water and their impact on quality.
- b) Explain water quality standards for hospitals & fire fighting.

Q3) Answer the following :

[10]

- a) Write down various sources of water and explain surface water quality.
- b) Explain various unit operation in water treatment plant.

Q4) Write short notes on :

[10]

- a) Reverse Osmosis.
- b) Ultra filtration
- c) Chlorination

P.T.O.

Q5) Answer the following : **[10]**

- a) Define waste water and explain its impact on water environment.
- b) Importance of primary treatment in waste water treatment.

Q6) Answer the following : **[10]**

- a) Explain mechanism of trickling filter with sketch.
- b) Write down note on cyanide & chromium removal in Galvanizing industrial waste water.

Q7) Answer the following : **[10]**

- a) Which are different models of anaerobic digestion? Explain one of them.
- b) Sketch a flow chart of waste water treatment plant for Dairy industry.

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

- a) Phenol removal
- b) Oil & Grease removal
- c) Grit chamber



Total No. of Questions : 8]

SEAT No. :

P1358

[5437]-304

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC-304 : Environmental Law, Ethics and Policy

(2013 Pattern) (Semester-III)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Solve any five Questions from the following.*
- 2) Neat and labeled diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*

Q1) Answer the following. [10]

- a) Discuss the need for environmental governance in India.
- b) Write an account on role of constitution in environmental protection.

Q2) Answer the following. [10]

- a) Discuss the salient features of water act, 1974
- b) What are functions of CPCB and SPCB's under air act, 1981?

Q3) Answer the following. [10]

- a) What are guidelines to manage biomedical wastes under regulations?
- b) What are the important provisions of motor vehicle rules regarding protection of environment?

Q4) Answer the following. [10]

- a) Explain in detail the outcome of Rio conference.
- b) What is the role of united nations authorities to protect global environment?

Q5) Answer the following. [10]

- a) What are the important features of Nairobi declaration?
- b) Discuss the objectives in relation with important provisions of biological diversity act.

P.T.O.

Q6) Answer the following. **[10]**

- a) How national forest policy is helpful in protection of forests of our country?
- b) What are different ethical theories applied to environment.

Q7) Answer the following. **[10]**

- a) Discuss in detail on important pillars of sustainable development
- b) What are the issues associated with environmental ethics and increasing population?

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

- a) Natural Resources and Sustainable Development.
- b) National Environmental Policy.

✓ ✓ ✓

Total No. of Questions : 8]

SEAT No. :

P1359

[5437]-305

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 307 : Man and Environment

(2013 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Solve any five questions from the following.*
- 2) Neat and labeled diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*

Q1) Answer the following.

[10]

- a) Explain the role of human being in conservation programme.
- b) Explain the role of technology application in resource management practices.

Q2) Answer the following.

[10]

- a) Which environmental factors influences population growth.
- b) Which elements governs the hierarchy in human settlement.

Q3) Answer the following.

[10]

- a) What is biotic potential of population. Add a note on environmental resisting factors.
- b) Briefly explain the evolution theory of human ecology.

Q4) Answer the following.

[10]

- a) What are the limiting factors of environment. Add a note on Laws of minimum tolerance.
- b) Explain the impact of food chain disturbance in ecosystem.

P.T.O.

Q5) Answer the following. **[10]**

- a) Explain the importance of demographic factors in national planning.
- b) What are the factors responsible for industrial growth.

Q6) Answer the following. **[10]**

- a) Enumerate the importance of rehabilitation programme in planning.
- b) Explain the over dosing of pesticides in agrarian ecosystem.

Q7) Answer the following. **[10]**

- a) Write the short note on organization structure in rural ecosystem.
- b) Explain the importance of sacrel grooves in rural ecosystem.

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

- a) What are the essential elements of equitable development planning.
- b) Distinguish between exploitation and conservation programme in resource management.



Total No. of Questions : 8]

SEAT No. :

P1360

[5437]-306

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 308 : Environmental Education

(2013 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Solve any five questions from the following.*
- 2) *Neat and labeled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following. **[10]**

- a) Explain how EE and ESD help in achieving sustainable development.
- b) What is Agenda 21? Enumerate it's contents.

Q2) Answer the following. **[10]**

- a) Discuss about the status of EE in Indian School Systems.
- b) Briefly describe the current policies and status of ESD in Germany.

Q3) Answer the following. **[10]**

- a) Discuss about the text books and Environmental Education.
- b) Write a note on Eco-Clubs.

Q4) Answer the following. **[10]**

- a) Discuss about project based learning environmental education at college and university level.
- b) Express views about civil society efforts in the area of waste reduction and management.

P.T.O.

Q5) Answer the following. **[10]**

- a) Discuss about civil society efforts in the area of health and sanitation.
- b) Explain the role of facilitator in environmental education.

Q6) Answer the following. **[10]**

- a) Describe the development and use of different approaches in the context of ESD.
- b) Explain the role and use of films in education for sustainable development (ESD).

Q7) Answer the following. **[10]**

- a) Discuss the role and use of websites in environmental education.
- b) Explain how nature camps are useful in ESD.

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

- a) Framework of competence for ESD.
- b) Nai Taleem.



Total No. of Questions : 8]

SEAT No. :

P1361

[5437]-307

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 309 : Environmental Biotechnology

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer any five questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *All questions carry equal marks.*

Q1) Answer the following.

- a) Explain the applications of environmental biotechnology in agriculture.
- b) Write about the role of microorganisms in waste treatment.

Q2) Answer the following.

- a) Write a note on airborne microbes & allergic disorders.
- b) Give the mechanism of biofuel production in detail.

Q3) Answer the following.

- a) What are the characteristics of algae? How are they classified?
- b) List the nutritional requirements of microbes & explain.

Q4) Answer the following.

- a) Write about the different types of media used for growing microbes.
- b) Explain the term synchronous growth & its significance.

P.T.O.

Q5) Answer the following.

- a) Explain the use of planktons as water quality indicators.
- b) Write about the application of biosensors in environmental monitoring.

Q6) Answer the following.

- a) What are the environmental factors affecting microbial growth? How to microbes adopt to change in these factors?
- b) Explain the significance of germ plasm conservation.

Q7) Answer the following.

- a) What is biomining? Explain the significance in detail.
- b) Write a note on biodegradation of macro molecules.

Q8) Write short notes on.

- a) Types of biosensors
- b) Biomethanation
- c) Use of Lichens as bioindicators



Total No. of Questions : 8]

SEAT No. :

P1362

[5437]-308

[Total No. of Pages : 2

M.Sc. (Environmental Science)

EVSC - 310 : ENVIRONMENTAL RESOURCE MONITORING

(2013 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any five questions from the following.*
- 2) *Neat and labeled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following. **[10]**

- a) What is ambient air quality? What are the national standards for it?
- b) Explain the principle of ambient air sampler with suitable sketch.

Q2) Answer the following. **[10]**

- a) Differentiate between Noise and Vibration.
- b) Explain the basic noise unit and Lmax.

Q3) Answer the following. **[10]**

- a) Explain the methods to fulfill water monitoring objectives.
- b) What are the guidelines for handling & storage of water sample.

Q4) Answer the following. **[10]**

- a) What are the general standards for effluent.
- b) Explain the drinking water standards.

Q5) Answer the following. **[10]**

- a) Explain the sampling methodology for soil testing.
- b) Explain the important soil quality indicators.

P.T.O.

Q6) Answer the following. **[10]**

- a) What is the importance & scope of forest resource monitoring?
- b) What are the techniques for wild life monitoring?

Q7) Answer the following. **[10]**

- a) How remote sensing and aerial photography is used in environmental Resource Monitoring?
- b) Explain the basics & methodology for Odour Monitoring.

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

- a) Soil profile.
- b) Criteria for sampling port in stack.



Total No. of Questions : 8]

SEAT No. :

P1363

[Total No. of Pages : 2

[5437]-401

M. Sc.

ENVIRONMENTAL SCIENCE

EVSC - 401 : Environmental Toxicology, Health and Safety

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any five questions from the following.*
- 2) *Neat and labelled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) a) Write a short note on accidental potential & mitigation measure (any two).

- i) Construction phase
- ii) Commissioning phase
- iii) Operation phase

b) Write a note on thermal and biological hazards. **[10]**

Q2) a) How noise and vibration are affects on human health.

b) Explain factory act 1986 and its welfare provision. **[10]**

Q3) a) What are the guideines of hazardous waste management.

b) How safety, health and environment aspect are important in industry. **[10]**

Q4) a) Write a short note on following toriccants. (any two) :

- i) Zn
- ii) Cu
- iii) Al

b) Briefly explain the OECD guidelines for acute and chronic toxicity testing. Add note on inhalation toxicity. **[10]**

P.T.O.

- Q5)** a) What is hazardous waste? Classify it and add a note on metabolic disorders caused due to lead in fauna.
b) What is water born disease and explain its impact on economy. [10]
- Q6)** a) Explain effects of industrial development on human health.
b) What is the importance of sanitation program in rural area. [10]
- Q7)** a) Write a short note on (any two)
i) Safeguarding techniques for water resources
ii) WHO.
iii) Biological safety.
b) Explain impact of hazardous waste management on air quality. [10]
- Q8)** a) Explain public participation in offsite safety measurement program.
b) What are the sources of zinc contamination in environment? Explain its effects on environment. [10]



Total No. of Questions : 8]

SEAT No. :

P1364

[5437]-402

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC - 402 : Restoration Ecology and Watershed Management
(2013 Pattern) (Semester - IV)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Solve any five Questions from the following.*
- 2) Neat and labeled diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*

Q1) Answer the following : [10]

- a) Define 'Eco - restoration' and explain the need of it.
- b) What is the need of watershed planning ? Enlist the watershed planning strategies.

Q2) Answer the following : [10]

- a) Explain the role of 'key stone' species in restoration of degraded forest patches.
- b) Explain in detail, the process of restoration of solid waste dumping sites.

Q3) Justify the following statements. [10]

- a) Restoration of mangrove forest is very important in restoration of coastal eco-system.
- b) Bunding activity is very important in watershed projects.

Q4) Write a detailed note on following : [10]

- a) Geomorphological characteristics of watershed
- b) Types of soil erosion.

Q5) Answer the following : [10]

- a) Explain in detail, methodology of ground and surface water investigation.
- b) Using suitable example, explain role of pioneer and seral communities in restoration process.

P.T.O.

Q6) Answer the following. **[10]**

- a) Discuss in detail, causes of degradation of grassland and explain methodology for its restoration.
- b) How soil micro-flora is helpful in eco-system restoration ?

Q7) Answer the following . **[10]**

- a) Enlist different techniques of water harvesting and storage of harvested water.
- b) What are the objectives of farming system ?

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

- a) Peoples participation in watershed management.
- b) Objectives of land capability classification and its characteristics.



Total No. of Questions : 8]

SEAT No. :

P1365

[5437]-403

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC - 403 : Waste & Hazardous Waste Management
(2013 Pattern) (Semester - IV)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer any five questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *All questions carry equal marks.*

Q1) a) What is solid waste? Give the environmental and health impacts of solid waste. **[5]**

b) What are factors affecting solid waste management? **[5]**

Q2) a) Explain the importance of segregation of wastes in solid waste management. **[5]**

b) Write a note of collection systems for municipal solid waste in India. **[5]**

Q3) a) Write about the solid wastes generated in sugar industry and their management. **[5]**

b) Differentiate between industrial and agricultural solid waste. **[5]**

Q4) a) What is the 3R principle and how does it help in solid waste management? **[5]**

b) What are the different materials that can be recycled? How does recycling help in conservation? **[5]**

P.T.O.

- Q5)** a) Discuss the environmental concerns associated with incineration. [5]
b) What is biogasification? Explain its advantages. [5]
- Q6)** a) Describe the role of local authorities in solid waste management. [5]
b) Write a short note on color coding of biomedical waste. [5]
- Q7)** a) Write a note on transportation and processing of hazardous wastes. [5]
b) Discuss the responsibilities of various authorities in hazardous waste management. [5]
- Q8)** a) What is electronic waste? Explain the significance of electronic waste management. [5]
b) Discuss the importance of radio active waste management. [5]



Total No. of Questions : 8]

SEAT No. :

P1366

[5437]-404

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 404 : Renewable and Non-Renewable Energy

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Solve any five questions from the following.*
- 2) *Neat and labeled diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Answer the following. **[10]**

- a) Explain the sources of energy giving their classification.
- b) Write a note on solar spectrum.

Q2) Answer the following. **[10]**

- a) Write a note on energy content of coal.
- b) Discuss the environment problems associated with petroleum production.

Q3) Answer the following. **[10]**

- a) Discuss the merits and demerits of VASB technique.
- b) Explain the terms pyrolysis, compression, gasification and liquefaction.

Q4) Answer the following. **[10]**

- a) Explain the effects of leaching of uranium in to soil and groundwater.
- b) Write a note on radioactive waste disposal system.

Q5) Answer the following. **[10]**

- a) What is solar thermal energy? Explain how it is generated.
- b) Explain the process of solar electricity generation.

P.T.O.

Q6) Answer the following. **[10]**

- a) Discuss the factors considered for selecting sites of wind mills.
- b) Discuss the wind energy potential in India.

Q7) Answer the following. **[10]**

- a) Explain the principles used in generation of hydroelectric power.
- b) Discuss the hazards of hydroelectric generation.

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

- a) Problems and prospects of Tidal and wave energy in India.
- b) Prospects of Geothermal energy in India.



Total No. of Questions : 8]

SEAT No. :

P1367

[5437]-405

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 407 : Environmental Economics

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions carry equal marks.*
- 2) *Black figures to the right indicate full marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

Q1) a) How sustainable development is linked with environmental economics.

b) What are adaptive options used in facing climate change.

Q2) a) What are the reasons for market failure? Add a note on its impact on environmental aspects.

b) Write different objectives of sustainable development.

Q3) a) Discuss about various preference methods for environmental valuation.

b) What is environmental sustainability index.

Q4) a) Write an account of strategies of Global sustainability.

b) Give in detail the functional role of economic instruments in environmental policies.

Q5) a) Discuss the importance of Biodiversity conservation in sustainable development.

b) Explain the approaches for sustainable development.

P.T.O.

Q6) a) Write the different indicators of sustainable development.

b) What are carbon credits.

Q7) a) What is Cost-Benefit Analysis.

b) Give the difference between short term and long term impacts of climate change.

Q8) a) Elaborate on the significance of environmental Kuznet's Curve.

b) How adaptive options are significant in combating climate change.



Total No. of Questions : 8]

SEAT No. :

P1368

[5437]-406

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

EVSC - 406 : Forestry and Habitat Management

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Solve any five questions from the following.*
- 2) Neat and labelled diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*

Q1) Answer the following :

[10]

- a) Describe in brief the concept, scope and need of Habitat Management.
- b) Describe the importance and role of Joint Forest Management Programme.

Q2) Discuss the following :

[10]

- a) Discuss about the abiotic components and its stress on forest ecosystem.
- b) Discuss what are the control function of Silviculture.

Q3) Explain the following :

[10]

- a) Explain what are the traditional practices used in Silviculture.
- b) Explain how development activities influences on forest system.

Q4) Write notes on the following :

[10]

- a) Impact of construction and development projects on Forest Conservation.
- b) Method and techniques used in Tree improvement and Seed Technology.

P.T.O.

Q5) Answer the following : **[10]**

- a) Describe economical important species in forest Management.
- b) Describe about seed ripeness and cold stratification in artificial regeneration of forest.

Q6) Discuss the following : **[10]**

- a) Discuss the various causes of forest damage.
- b) Discuss cost benefit ratio analysis of forest product.

Q7) Explain the following : **[10]**

- a) Explain the salient features of Forest Act 1927.
- b) Explain the Salient features of Forest Conservation Act 1980.

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

- a) Methods used for measuring Girth, height and volume of trees.
- b) Susceptibility of forest due to chemical, biological controls.



Total No. of Questions : 8]

SEAT No. :

P1369

[5437]-407

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

**EVSC - 409 : Wildlife Management and Conservation
(2013 Pattern) (Semester - IV) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) Answer the following : [10]

- a) What are the advances involved in conservation of Wildlife?
- b) Which are various studies associated with conservation of Wildlife?

Q2) Answer the following : [10]

- a) Discuss Wildlife diversity in coastal areas of India.
- b) Add a note on Wildlife diversity in Western Ghats.

Q3) Answer the following : [10]

- a) What is mammalogy? Discuss various ways of conservation under these studies.
- b) Add a note on Wildlife diversity in Kanha and Bandipur nation park.

Q4) Answer the following : [10]

- a) What is Herpetology? Discuss importance of these studies in conservation of species.
- b) Which are various legal measures taken by India for protection of Wildlife?

P.T.O.

Q5) Answer the following : **[10]**

- a) Discuss in detail on wildlife of Eastern Himalayan region.
- b) What is role of various government departments in wildlife management?

Q6) Answer the following : **[10]**

- a) Which are major zoogeographical zones of the world?
- b) What is role of various traditional community conservation practices in wildlife management?

Q7) Answer the following : **[10]**

- a) What are wilderness areas? Discuss role of these in maintenance of ecological balance.
- b) What is importance of biodiversity registers in conservation of wildlife?

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

- a) Zoogeography of India.
- b) Captive Breeding.



Total No. of Questions : 8]

SEAT No. :

P1370

[5437]-408

[Total No. of Pages : 2

M.Sc.

ENVIRONMENTAL SCIENCE

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Solve any five questions from the following.*
- 2) Neat and labelled diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*

Q1) Answer the following : [10]

- a) Explain in short the precision farming.
- b) Explain in brief about low input sustainable Agriculture.

Q2) Answer the following : [10]

- a) Discuss the importance of organic agricultural production.
- b) What are the benefits of providing incentives in promotion of Sustainable agriculture?

Q3) Answer the following : [10]

- a) Describe the importance of Weed control.
- b) Discuss in brief the importance of crop rotation.

Q4) Answer the following : [10]

- a) Write in brief about extensive livestock keeping.
- b) Explain in short about demerits of Agropastoralism.

P.T.O.

Q5) Answer the following : **[10]**

- a) Give various factors responsible for soil salinity.
- b) Give the various agricultural issues related with wet lands.

Q6) Answer the following : **[10]**

- a) Write in short about vegetable nursery farms.
- b) Discuss in brief about pest management in organic farming.

Q7) Answer the following : **[10]**

- a) Explain the importance of certification and accreditation process for export of agriculture goods.
- b) Explain the bio control methods for pest management.

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

- a) Bio-fertilizers.
- b) Recycling of organic residues.

