

Total No. of Questions : 7]

SEAT No. :

PD-3499

[Total No. of Pages : 2

[6483]-11

M.Sc.

ENVIRONMENTAL SCIENCES

**EVSUT - 111 : Environmental Biology and Biodiversity
(2019 Pattern) (Semester - I)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *Question 1 is compulsory.*
- 2) *Answer any five questions from Q.2 to Q.7.*

Q1) Answer any five of the following :

[5 × 2 = 10]

- a) Explain the term seral communities & climax.
- b) Write any four reasons for population dispersal.
- c) What is ecotone?
- d) Write in brief about -
Decomposers and their role in environment.
- e) Briefly explain types of symbiosis.
- f) Define ecological niche.

Q2) a) Describe the energy fixation processes and explain flow of energy in an ecosystem using 'Y' shaped energy model. **[7]**

b) Which factors are responsible for distribution of species and explain how? **[5]**

Q3) a) Discuss the challenges and adaptations of plants and animals from fresh water biome / ecosystem. **[7]**

b) Write a note on - Types of behaviour observed in animal kingdom. **[5]**

P.T.O.

- Q4)** a) How climatic and adaptic factors influences terristrial ecosystem? [7]
b) Write a note on 'survivorship curve' and 'age distribution'. [5]
- Q5)** a) Which are the major communication medium? Methods observed in plant kingdom. Explain its working. [7]
b) Elaborate on association of micro-organisms with plants and animals. [5]
- Q6)** a) How microbes are useful in bio-remediation and ecological restoration processes? Explain with suitable example. [7]
b) Write in detail about vegetation types observed in India, by mentioning geographical areas of its distribution. [5]
- Q7) Write a short note on any two of the following :** [12]
a) Draw and describe Heinrich Walter's biome climate diagram.
b) What is territoriality? Discuss the reason of aggressive behavior of animals.
c) Note on Indian biodiversity & its comparison with global diversity.



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SEAT No. :

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PD3500

[6483]-12

M.Sc. - I

ENVIRONMENTAL SCIENCE

**EVSUT-112: Environmental Physics & Chemistry
(2019 Pattern) (Semester - I) (4 Credits)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q.1 is compulsory.
- 2) Answer any 5 questions form Q.2 to Q.7.

Q1) Answer any five of the following.

[5×2=10]

- a) Define the term X-ray?
- b) Define the term functional group?
- c) Define the term refraction?
- d) Define the term nuclear fission.
- e) Define the term specific heat?
- f) Define the terms cation & anion?

Q2) a) What are isotopes? Explain in detail isotope dilution analysis.

[7]

b) Explain the principle & working of mass spectrometry.

[5]

Q3) a) What is stoichiometry? Explain the gas stoichiometry in detail.

[7]

b) Comment on reversible and irreversible reactions of water.

[5]

Q4) a) Define the terms unsaturated & saturated hydrocarbons? Explain its importance in Environment.

[7]

b) What is Atomic nuclear? Explain the nuclear fission & fusion reaction.

[5]

Q5) a) What is seismology? Explain it application in Environment.

[7]

b) Explain the polarization by reflection.

[5]

P.T.O.

- Q6)** a) What are free radicals? Explain some reactions of free radicals? [7]
b) Explain the phosphorus cycle & its Environmental significance. [5]

Q7) Solve any two of the following.

- a) Carbon dating [6]
b) Redox potential [6]
c) Gibbs's energy [6]



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SEAT No. :

PD3501

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[6483]-13

First Year M.Sc. (Environmental Science)

**EVSUT-113: EARTH, OCEAN & ATMOSPHERIC SCIENCES
(2019 Pattern) (Semester - I)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any five questions form Q.2 to Q.7.*

Q1) Answer any five of the following.

[5×2=10]

- a) What are confined aquifers.
- b) What is zone of aeration.
- c) Give significance of E horizon of soil.
- d) Role of precipitation in Hydrogen cycle.
- e) What is the difference between weather & climate.
- f) How are oceanic waves formed.

Q2) a) Describe the processes & agents of weathering.

[7]

b) Discuss theory of sea floor spreading.

[5]

Q3) a) Explain the human influence on radiation balance.

[7]

b) Plumes are a function of air vertical stability. Justify.

[5]

Q4) a) Discuss in detail the process of Rock formation.

[7]

b) Elaborate on the role of El Nino & La Nina on Indian Monsoon.

[5]

Q5) a) Discuss in detail the Internal structure of Earth.

[7]

b) Groundwater plays significant role in economy. Explain.

[5]

P.T.O.

Q6) a) What are fronts? Give their classification. **[7]**

b) Give a detail account of Emission Inventory. **[5]**

Q7) Write short notes on any two of the following. [2×6=12]

a) Insolation and heat balance

b) Igneous Rocks

c) Thermohaline water circulation



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SEAT No. :

PD3502

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[6483]-14

First Year M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT 114 : Environmental Statistics

(2019 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question No.1 is compulsory.*
- 2) *Solve any 5 questions from Q.2 to Q.7.*
- 3) *Statistical tables/graph papers will be provided on request.*
- 4) *Use of non-scientific calculator is allowed.*

Q1) Answer any Five of the following.

[5×2=10]

- a) What is Skewness? Write down Bowley's coefficient of Skewness.
- b) What is classification? State various criteria of classification.
- c) What is relation between correlation and regression? Whether both are symmetric?
- d) The equation of normal distribution is given by $-\frac{1}{32}(x^2 - 40x + 400)$
 $f(x) = k$.e Write down the values of k, mean and standard deviation.
- e) State the empirical relation between mean, median and mode. Use it to find median of the distribution whose mean is 26.8 and mode is 30.1.
- f) Write formula for Karl Pearson's β_2 coefficient. State meaning of notation, in the formula.
- g) The mean of 200 items is 48 and their standard deviation is 3. Find the sum and sum of squares of all items.

Q2) a) What is graphical representation? State different types of graphs. What is an ogive? Explain its construction. Which measure is determined from it. **[7]**

- b) The company gave the bonus of Rs. 10, 20, 30 and 40 to the workers in the respective salary groups 200-300, 300-400, 400-500 and 500-600. The monthly salary of 15 workers are given below 550, 560, 210, 320, 460, 480, 510, 530, 316, 254, 258, 320, 322, 240, 580. Calculate the average bonus paid per worker. **[5]**

P.T.O.

- Q3)** a) What is meant by central tendency? Which measures are graphically determined? Describe graphic presentation of any measures of central tendency? [7]
- b) For bivariate data, the mean value of X is 20 and the mean value of Y is 45. The regression coefficient of Y on X is 4 and that of X on Y is $\frac{1}{9}$. [5]
- i) Write down the equation of two regression lines.
- ii) Standard deviation of X, if standard deviation of Y is 12.
- Q4)** a) What is partition value? Write down various partition values. State the formula to calculate 2nd quartile with notation and explain graphic method to determine for the same when grouped frequency distribution is given? [7]
- b) The first and third quartiles of normal distribution are 92 and 128. Find mean and standard deviation? [5]
- Q5)** a) Explain the term Skewness and Kurtosis. State the types of skewness and Kurtosis. Describe the procedure to measure it. [7]
- b) In class of 50 students, 10 have failed and their average marks is 2.5. The total marks secured by the entire class was 281. Find the average marks of students who have passed. [5]
- Q6)** a) What is difference between partial correlation and multiple correlation? If the variables X_1 , X_2 and X_3 are inter related, then write partial correlation between them? How many values of partial correlation coefficient? [7]
- If $r_{12}=0.70$, $r_{13}=0.61$, $r_{23}=0.40$, Find $r_{12.3}$
- b) The mean of two sample of sizes 50 and 100 respectively are 54.1 and 50.3 with their corresponding standard deviations 8 and 7. Obtain the standard deviation of combined sample of size 150? [5]
- Q7)** Write a short notes any two of following. [12]
- a) Time series analysis
- b) Statistical quality control techniques
- c) Normal probability distribution



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PD3503

[6483]-21

M.Sc. - I

ENVIRONMENTAL SCIENCE

**EVSUT-121: Water and Soil Pollution Management & Mitigation
(2019 Pattern) (Semester-II)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Answer any 5 questions from Q.2 to Q.7.*

Q1) Answer any five of the following. [10]

- a) Define Bioventing.
- b) Give any two characteristics of domestic waste water.
- c) Name the instrument used to monitor ground water.
- d) What is Ballast water.
- e) Give two examples of microbial transformation of heavy metals.
- f) Write any 2 impact of hazardous waste dumping on soil.

Q2) a) Explain the effect of water pollution with the help of case studies. [7]

b) Explain the exsitu techniques of ground water remediation. [5]

Q3) a) What are the roles of different regulatory bodies in prevention of groundwater. [7]

b) How Bioremediation technology can help to remove pollutants from marine water. [5]

Q4) a) Explain the numerical simulation for aquifer yield prediction. [7]

b) Write impact of hazardous solid waste on soil. [5]

Q5) a) How mining activity causes soil deterioration. [7]

b) What are types and sources of fresh water pollution. [5]

P.T.O.

Q6) a) What is Darcy's law for estimation of hydraulic parameter. [7]

b) Describe physical measures to control marine pollution. [5]

Q7) Write short notes on any two of the following. [12]

a) Artificial Recharge.

b) Drinking water standard.

c) Permeable reactive barrier.



Total No. of Questions : 7]

SEAT No. :

PD3504

[Total No. of Pages : 2

[6483]-22

First Year M.Sc.

ENVIRONMENTAL SCIENCE

**EVSUT 122 : Environmental Pollution -II Air Noise and Radiation
Pollution : Management & Mitigation
(2019 Pattern) (Semester -II)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is Compulsory.*
- 2) *Answer any 5 questions from Q2 to Q7.*

Q1) Answer any five of the following.

[5×2=10]

- a) Explain in brief line source and area source with examples
- b) Define atmospheric stability
- c) What is absorbed dose?
- d) Explain Leg
- e) What is temporary threshold shift?
- f) What principle does the electrostatic precipitator work on?

Q2) a) Explain the formation and destruction of stratospheric ozone **[7]**

- b) What are the factors responsible for deterioration of air quality in Delhi NCR in winter? **[5]**

Q3) a) What are the different sources of noise? Explain the strategies used for control of noise. **[7]**

- b) How does exposure to noise affect hearing? Explain in detail. **[5]**

Q4) a) Which air pollution control equipment works on the principle of centrifugal separation? Explain the working with diagram. Give advantages and limitations. **[7]**

- b) How can fuel selection help in air pollution control? Explain with examples. **[5]**

P.T.O.

- Q5)** a) What are the types of radiation? Explain the biological effects and health hazards associated with radiation. [7]
b) What are the methods used for treatments disposal of radioactive waste? [5]
- Q6)** a) Explain the control of gaseous pollutants through different principles. Give examples. [7]
b) Describe the sampling and estimation of ambient SO_x [5]
- Q7)** Write short notes on any two of following. [12]
a) Chernobyl accident and its impacts
b) Noise control by design
c) Methods of cleaning fabric filters



Total No. of Questions : 7]

SEAT No. :

PD3505

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[6483]-23

M.Sc. - I

ENVIRONMENTAL SCIENCE

EVSUT-123: Environmental Law, Ethics & Policy

(2019 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any 5 questions from Q.2 to Q.7.*

Q1) Answer any five of the following.

[10]

- a) Write the statement of Article 48A.
- b) What is the fullform of UNFCCC.
- c) Give any 2 Roles of CPCB under Air Act, 1981.
- d) Define Eco-sensitive zone.
- e) What is main objective of Kyoto Protocol.
- f) Enlist any 4 Hazardous waste classified under Hazardous Waste Rule.

Q2) a) Explain how research work can be carried in Protected area under Biological Diversity Act - 2002. **[7]**

b) Give the classification of solid waste according to solid waste Management Rule. **[5]**

Q3) a) Explain the role of Indian Constitution in protection of Environment. **[7]**

b) Discuss the Cartegena Protocol on Bio-safety. **[5]**

Q4) a) What is the contribution of stockholm conference on Environment 1972, towards protecting the environment. **[7]**

b) Explain silent features of RIO declaration on Environment & Development. **[5]**

Q5) a) Elaborate the provisions relating to Sanctuaries & National Park under the wildlife (Protection) Act, 1972. **[7]**

b) Discuss the Importance & difference of Law & Policy. **[5]**

P.T.O.

Q6) a) Explain Hunting, state the provision relating to Hunting of Wild Animals under wildlife Act, 1972. [7]

b) State & Explain the various kinds of forest under the forest Act. [5]

Q7) Write short notes on any two of the following. [12]

a) Coastal Regulation Zone.

b) CITES.

c) E-waste Rule.



Total No. of Questions : 7]

SEAT No. :

PD3506

[Total No. of Pages : 2

[6483]-24

First Year M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT - 124 : Water & Waste Water Technology

(2019 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Answer any 5 questions from Q.2 to Q.7.*

Q1) Answer any five of the following.

[5×2=10]

- a) Which IS standards are follow for the drinking water? What are the acceptable limits for hardness & chlorides?
- b) What is population forecasting? Write names of two methods used.
- c) What are the domestic and Industrial water requirement standards in India.
- d) Give the factors affecting the sewage characteristics due to urbanization.
- e) Draw a sketch of stabilization pond with title.
- f) Give the two impact of oil & grease containing effluent on water body.

Q2) a) Draw a flow chart of water treatment plant & explain the importance of deration in water treatment plant. **[7]**

b) Write a note on anaerobic digestion & brief the hybrid digester. **[5]**

Q3) a) Explain activated sludge process (ASP). **[7]**

b) Give the details on coagulation and chlorination. **[5]**

Q4) a) Explain importance of IS standards for the drinking water, Give the quantity of water required for school & hostel. **[7]**

b) Explain the role of microorganism in trickling filter. **[5]**

P.T.O.

Q5) a) What are the importance of Preliminary & Primary treatment in waste water treatment plant? Give the function of oil & grease skimmer. [7]

b) Explain the Arithmetic increase forecasting methods with example. [5]

Q6) a) Give the details of water softening & Reverse Osmosis. [7]

b) Explain the impact of dairy effluent & draw a flow diagram of ETP. [5]

Q7) Write short notes on any two of the following. [12]

a) R.B.C.

b) Extended Aeration

c) Screening



Total No. of Questions : 7]

SEAT No. :

PD-3507

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[6483]-31

M.Sc.

ENVIRONMENTAL SCIENCES

**EVSUT-231 : Environmental Impact Assessment &
Environmental Audit**

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *Question1 is compulsory.*
- 2) *Answer any 5 questions from Q.2 to Q7*

Q1) Answer any Five of the following :

[10]

- a) Briefly write about any two advantages of EIA process.
- b) What is screening? What is its significance in the EIA process?
- c) Define EIA and state its objectives (minimum two).
- d) Briefly write about appraisal process of EIA.
- e) Write in brief about comprehensive study a core value of EIA.
- f) Briefly write about basic structure of audit.

Q2) a) Suggest appropriate environmental management plan for highway projects on air environment, noise and ecology, biodiversity aspects. **[7]**

b) Discuss in details, advantages & limitations of public hearing procedure.**[5]**

Q3) a) Give generic structure of EIA report and explain the content of its chapter 1,2,4 and 5. **[7]**

b) Discuss the impact of iron ore mining on soil environment. **[5]**

P.T.O.

- Q4)** a) Discuss in detail, environmental impact of distillery projects and suggest appropriate mitigation plan for the same. [7]
b) Elaborate the methodology for data collection on social impact assessment. [5]
- Q5)** a) Explain the checklist and matrix methods of impact assessment. [7]
b) Which meteorological parameters/data monitored in the baseline data collection? Also explain its significance. [5]
- Q6)** a) Do you agree with an argument that EIA is expensive process, its too complex and doesn't produce results? Justify your answer. [7]
b) Explain operating principles of EIA. [5]
- Q7)** Write a short notes on any two : [12]
a) Consumption and solid waste audit.
b) History of EIA process in India.
c) Risk assessment for sugar industry and its mitigation.



Total No. of Questions : 7]

SEAT No. :

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PD3508

[6483]-32

M.Sc. - II

ENVIRONMENTAL SCIENCE

EVSUT-232: Remote Sensing & GIS

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any 5 questions from Q.2 to Q.7.*

Q1) Answer any 5 out of the following. [10]

- a) Give the wavelength for following EMR.
 - i) Visible rays (Blue, Red, Green)
 - ii) Infrared Radiation
- b) Give any two specific application of GPS.
- c) Enlist any four Geometrical feature of Aerial Photography.
- d) What are the factors governing interpretability.
- e) Give Basic difference between Active and Passive Remote Sensing.
- f) Define Digitization.

Q2) a) Explain in detail any two Radiation Laws. [7]

b) Give application of RS & GIS in Natural hazards & disasters. [5]

Q3) a) Define GPS. Explain the concept of GPS & Give it's application. [7]

b) Explain cylindrical and conical type of map projection. [5]

Q4) a) Explain EMR spectrum with neat labelled diagram. [7]

b) Explain in detail the process of Digitization. [5]

Q5) a) Explain the types of orbit and Give the difference between them. [7]

b) Write a note on Active Remote Sensing. [5]

P.T.O.

- Q6)** a) Explain following Atmospheric Interaction of EMR. [7]
i) Reflection
ii) Refraction
iii) Absorption
b) Describe the Image Rectification Technique. [5]
- Q7)** Write short Note on any two of the following. [12]
a) Drone Mapping
b) Whisk Broom scanning
c) Geo - Referencing



Total No. of Questions : 7]

SEAT No. :

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PD3509

[6483]-33

M.Sc. - II

ENVIRONMENTAL SCIENCE

**EVSUT-233: Restoration Ecology and Watershed Management
(2019 Pattern) (Semester - III)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any 5 questions form Q.2 to Q.7.*

Q1) Answer any five of the following. [10]

- a) What are gully plugs?
- b) What are gabion structures.
- c) What are different types of Aquifers.
- d) What are contour bunds.
- e) What are wet lands
- f) Give defination of Ecological Restoration.

Q2) a) Describe the process of restoration of soil in urban areas. [7]

b) Discuss the role of peak attenuation for flood risk management. [5]

Q3) a) Explain in the detail the process of mangrove restoration. [7]

b) What are project manitoring and result indicators for watershed management. [5]

Q4) a) Discuss the process for restoration of grasslands. [7]

b) Explain the reference site attributes to be considered for restoration. [5]

Q5) a) Illustrate with example rapid site assessment for degraded forest. [7]

b) Discuss the water harvesting measures for streams. [5]

P.T.O.

- Q6)** a) Give applications of instruments used for watershed surveys. [7]
b) Design a plan for soil conservation of agriculture dominated watershed.[5]

Q7) Write short notes on any two of the following. [12]

- a) Water table
- b) Significance of Eco Restoration
- c) Water harvesting projects in India



Total No. of Questions : 5]

SEAT No. :

PD3510

[Total No. of Pages : 2

[6483]-34

M.Sc. - II

ENVIRONMENTAL SCIENCE

**EVSUT - 235 : Environmental Management : EMS &
Life Cycle Assessment**

(2019 Pattern) (Semester - III)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Answer any 3 questions from Q2 to Q5.*

Q1) Answer any five of the following.

[5×1=5]

- a) What is environmental management?
- b) What is ED?
- c) What is LCA?
- d) What is green economy?
- e) What is UNDP?
- f) What is EZA?

Q2) a) Describe the importance steps required for achieving sustainable development. **[6]**

b) Comment upon tools of EMS. **[4]**

Q3) a) Explain the environmental benefits of EMS. **[6]**

b) Comment on role of government in EMS implementation. **[4]**

P.T.O.

- Q4)** a) Discuss the international standards in EMS. [6]
b) Comment upon stages of EMS. [4]
- Q5)** a) What are the basic principles of ISO 14000. [5]
b) What is green rating project. [5]
c) What is benefits of ED in EMS. [5]



Total No. of Questions : 5]

SEAT No. :

PD3511

[Total No. of Pages : 2

[6483]-35
M.Sc. - II
ENVIRONMENTAL SCIENCE
EVSUT-236 : Environmental Resource Monitoring
(2019 Pattern) (Semester - III)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) Q.1 is compulsory.
- 2) Solve any three questions from Q.2 to Q.5.
- 3) Questions 2 to 5 carry equal marks.

Q1) Solve any five of the following.

[5×1=5]

- a) Why is it important to monitor the population of the wildlife?
- b) What are the objectives of soil testing?
- c) Why dissolved oxygen is important in water quality?
- d) What factors can affect air quality?
- e) What is HVS?
- f) What do you mean by environmental monitoring?

Q2) a) Describe water sample preservation, handling & storage guidelines. **[6]**

- b) What do you mean by weather monitoring? How to monitor wind direction, wind velocity, temperature. **[4]**

Q3) a) Give explanation on water quality monitoring protocol. **[6]**

- b) Explain monitoring of NO_x in ambient air. **[4]**

P.T.O.

Q4) a) Describe measurement of form of trees & volume of felled trees. **[6]**

b) What are various impacts of noise on human & animals? **[4]**

Q5) Write short notes on any two of the following. [10]

a) Describe significance of extractable phosphorous (p) in soil monitoring.

b) What are the objectives of stack sampling?

c) What are the permissible limits of TDS, Hardness (asCaCO₃), Nitrate, sulphate & chloride as per drinking water IS 10500 : 2012?



Total No. of Questions : 7]

SEAT No. :

[Total No. of Pages : 2

PD3512

[6483]-41

S.Y. M.Sc.

ENVIRONMENTAL SCIENCE

**EVSUT-241: Solid & Hazardous Waste Management
(2019 Pattern) (Semester-IV)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Answer any 5 questions from Q.2 to Q.7.*

Q1) Answer any five of the following.

[5×2=10]

- a) What are the types of solid waste?
- b) Enlist the factors affecting SWM system.
- c) Define “RDF”.
- d) Enlist the any four characteristics of solid waste.
- e) What is construction & demolition waste?
- f) What is the source-based classification of solid waste?

Q2) a) Explain in detail about characteristics of Hazardous waste.

[7]

b) Enlist the factors that influencing waste collection system.

[5]

Q3) a) What are the environmental & health impacts of improper disposal of solid waste?

[7]

b) What are the objectives of using transfer stations?

[5]

Q4) a) Describe various methods of separation of solid waste.

[7]

b) How can incinerator help to reduce pollution?

[5]

Q5) a) Define Biomedical waste, what are the types of Biomedical waste? **[7]**

b) What are the four main ways to treat organic biodegradable waste? **[5]**

P.T.O.

- Q6)** a) What is e-waste, examples of e-waste, why it is a problem? [7]
b) Differentiate between aerobic & anaerobic composting of MSW? [5]

Q7) Write short notes on any two of the following. [12]

- a) Pyrolysis.
- b) Sanitary landfill.
- c) “3R” Principle.



Total No. of Questions : 7]

SEAT No. :

PD3513

[Total No. of Pages : 2

[6483]-42

S.Y. M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT 242 : Renewable and non renewable energy

(2019 Pattern) (Semester -IV)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is Compulsory.*
- 2) *Answer any 5 questions from Q2 to Q7.*

Q1) Answer any five of the following.

[5×2=10]

- a) Define energy. What are the units of energy.
- b) Advantages of generating energy from wastes.
- c) Enlist the types of hydropower projects.
- d) Wind energy is derived from solar energy explain in brief.
- e) How does a tidal barrage work?
- f) Define radioactivity and half life

Q2) a) What is the relationship between energy and development? Explain the Environmental impacts of energy use **[7]**

b) Write about the types of fossil fuels. Explain with examples and environmental impacts. **[5]**

Q3) a) Explain the different processes for conversion of biomass. Add a note of advantages of biomass energy. **[7]**

b) What is meant by decentralized energy generation? Explain the advantages. **[5]**

Q4) a) Write in detail about the environmental impacts of using nuclear energy including mining, processing refining fuel cycle and waste disposal. **[7]**

b) What are photovoltaics ? How are they used? **[5]**

P.T.O.

- Q5)** a) Explain with diagram the generation of hydroelectricity. What are the advantages and disadvantages of hydropower generation. [7]
- b) What is the principle of wind energy generation? Give the guideline for wind farm siting [5]
- Q6)** a) Explain the different technologies used in harnessing geothermals energy [7]
- b) Write about hydrothermal energy generation and its limitations. [5]
- Q7)** Write short notes on any two of following. [12]
- a) Necessity of energy conservation
- b) Nuclear fuel cycle
- c) Solar concentrators



Total No. of Questions : 5]

SEAT No. :

PD3514

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M.Sc. - II

ENVIRONMENTAL SCIENCE

**EVSUT-244: Environmental Toxicology, Health & Safety
(2019 Pattern) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any 3 questions from Q.2 to Q.5.*

Q1) Answer any five of the following.

[5×1=5]

- a) What is acute effect?
- b) Define LC_{50} .
- c) What is Risk?
- d) Give two examples of airborne bacteria.
- e) What are the five major hazard in the work place?
- f) Which is most common target organ in toxicity?

Q2) a) What are the disorder caused in industry by air pollutants.

[6]

b) How the ergonomic will help in reducing risk factor.

[4]

Q3) a) Write note on safety standards and management system.

[6]

b) Explain Biological warfare and its impact.

[4]

Q4) a) Write down role of management as per ISO - 45001.

[6]

b) Explain public participation in prevention policies.

[4]

Q5) Write short notes on any two of the following.

[10]

- a) Indoor air pollution.
- b) Role of WHO in disease prevention.
- c) Environmental & Safety Policy.



Total No. of Questions : 5]

SEAT No. :

PD3515

[Total No. of Pages : 1

[6483]-44

M.Sc. - II

ENVIRONMENTAL SCIENCE

EVSUT-245: Environmental Economics

(2019 Pattern) (Semester - IV)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any 3 questions from Q.2 to Q.5.*

Q1) Answer any five of the following.

[5×1=5]

- a) Enlist the public goods.
- b) Define environmental economics.
- c) What is the full form of GDP?
- d) Give any two examples of positive externalities.
- e) What are incentives?
- f) What is social cost?

Q2) a) Explain how command and control approach used to control environmental pollution. **[6]**

b) Explain the concepts of public goods and externalities. **[4]**

Q3) a) Write in brief Global perspective of environmental economics. **[6]**

b) Discuss the scope of environmental economics. **[4]**

Q4) a) Explain in detail role of incentives and subsidies in environmental economics. **[6]**

b) What is NNP? Explain in detail. **[4]**

Q5) Write short notes on any two of the following.

[10]

- a) Human Development Index
- b) Green economy
- c) Social cost



Total No. of Questions : 5]

SEAT No. :

PD4694

[Total No. of Pages : 2

[6483]-45R

S.Y. M.Sc.

ENVIRONMENTAL SCIENCE

**EVSUT 247 : Environmental Biotechnology & Nanotechnology
(2019 Pattern) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Answer any 3 questions from Q.2 to Q.5.*

Q1) Answer any five of the following. **[5]**

- a) What is PCR?
- b) Define environmental Nanotechnology.
- c) What is nZVI?
- d) What is Biosafety?
- e) What is biostimulation?
- f) What is nanorods?

Q2) a) Explain various recombinant DNA guidelines. **[6]**

b) Write a note on soil remediation. **[4]**

Q3) a) Explain any one physical method for nanoparticle synthesis. **[6]**

b) What is cloning vector? Explain in brief. **[4]**

P.T.O.

Q4) a) How to use biomonitors in detecting environmental pollutants?
Explain it. **[6]**

b) Write applications of biometallic nanoparticles. **[4]**

Q5) Write a short notes on any two of the following. **[10]**

a) Biofuels : An alternative source of fuel.

b) Next generation sequencing.

c) Biomining and bioleaching.



Total No. of Questions : 5]

SEAT No. :

PD3517

[Total No. of Pages : 2

[6483]-46

M.Sc. - II

ENVIRONMENTAL SCIENCE

**EVSUT 248 : Environmental Policy, Climate Change and Sustainability
(2019 Pattern) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Answer any 3 questions from Q.2 to Q.5.*

Q1) Answer any five of the following.

[5×1=5]

- a) Which international panel is responsible for assessing climate change science?
- b) What is the primary cause of Earth post climate changes?
- c) What is the main objective of carbon trading?
- d) Which international declaration was considered the first global environmental action plan.
- e) Which nation is key in advocating for climate justice?
- f) What is global warming potential?

Q2) a) What evidence can oxygen & carbon isotope provide about past climate conditions? **[6]**

b) Evaluate the impact of climate change on water resources. **[4]**

Q3) a) How does the carbon sequestration in forest and wetlands differ from that in Agricultural land? **[6]**

b) What role does the Intergovernmental panel on climate change (1 PCC) play in shaping global climate policies? **[4]**

P.T.O.

Q4) a) Discuss in details about mass extinctions. **[6]**

b) Which are the major threats to coastal areas due to climate change? **[4]**

Q5) Write short notes on any two of the following. [10]

a) Proxies

b) Global warming

c) UNFCCC

