

Total No. of Questions : 7]

SEAT No. :

[Total No. of Pages : 2

P2591

[6070]-211

F.Y. M.Sc.

ENVIRONMENTAL SCIENCE

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

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Solve any five questions from Q.2 to Q.7.*
- 3) *Questions 2 to Q.7 carry equal marks.*

Q1) Answer any five of the following.

[10]

- a) Name the pollutant disposed through off shore drilling.
- b) What is sea water intrusion.
- c) What do you mean by Ballast water.
- d) Enlist chemical method to control marine pollution.
- e) What is application of piezometer.
- f) Give drinking water standard for chloride and TDS.

Q2) a) Explain all pollutants responsible for water pollution.

[7]

b) Write a note on Land subsidence.

[5]

Q3) a) Explain the numerical simulation for aquifer yield prediction.

[7]

b) Write the impact of hazardous solid waste on soil.

[5]

Q4) a) How mining activity causes soil deterioration.

[7]

b) Discuss any one case study related to groundwater pollution.

[5]

P.T.O.

- Q5)** a) Explain in detail consequences of marine water pollution. [7]
b) Write a note on effluent standards. [5]
- Q6)** a) How regulatory bodies help to prevent Groundwater Pollution. [7]
b) Describe about permeable reactive barrier. [5]
- Q7)** Write short notes on any two of the following. [12]
a) Method of wastewater disposal on soil.
b) Artificial Recharge
c) Bio-slurpping



Total No. of Questions : 7]

SEAT No. :

P2600

[Total No. of Pages : 2

[6070]-411

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 No. Q.1 is compulsory.*
- 2) *Solve any five questions from Q.2 to Q.7.*
- 3) *Questions 2 to Q.7 carry equal marks.*
- 4) *Figures to the right indicate full marks.*

Q1) Answer any five of the following.

[10]

- a) What are the functional elements of solid waste management system.
- b) Ultimate analysis of solid waste includes which parameters?
- c) What are the Environmental effect of improper waste management.
- d) What is seperation? Enlist any two seperation technique.
- e) Define composting & Pyrolysis
- f) Write down categories of bio-medical waste according to colour code.

Q2) a) Explain in detail chemical characteristics of solid waste.

[7]

- b) What are the different chemical treatment use for hazardous waste disposal?

[5]

Q3) a) Explain in detail solid waste management in textile industry.

[7]

- b) What is the type based classification of solid waste?

[5]

Q4) a) Explain in detail factors affecting solid waste management.

[7]

- b) Explain in detail about "Sanitary Landfilling"

[5]

P.T.O.

Q5) a) What are the different components of collection facility. [7]

b) What is Bio-medical waste? Explain in detail about its classification. [5]

Q6) a) Explain the need of source reduction in waste management. [7]

b) What are the environmental & health impacts of solid waste? [5]

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

a) Drying & Dewatering

b) “3R Principal”

c) Transfer station



Total No. of Questions : 7]

SEAT No. :

P-2587

[Total No. of Pages : 2

[6070]-111

M.Sc. (Part - I)

ENVIRONMENTAL SCIENCES

EVSUT-111 : Environmental Biology & Biodiversity

(2019 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Questions 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 is Biosphere?
- b) What is Ecology?
- c) What is mean by photosynthesis and chemosynthesis?
- d) What is competition? Give suitable example.
- e) What is mutulism? Give suitable example.
- f) What is tragedy of commons?

Q2) a) Explain Biochemical cycles with reference to carbon cycle.

[7]

b) Write a note on food chain and food web.

[5]

Q3) a) Describe in detail of wetlands and its types and functions.

[7]

b) What is ecosystem? Explain it in detail.

[5]

Q4) a) Explain role of ecotone in remedial measures and restoration.

[7]

b) Describe in detail of population Growth.

[5]

P.T.O.

- Q5)** a) What are the values of biodiversity? Write in detail. [7]
b) Write a detail note on niche and keystone species. [5]
- Q6)** a) Describe the role of biosphere in life support systems. [7]
b) Write a note on Mountain Biomes. [5]
- Q7)** Write a short note on any two of the following : [12]
a) Explain ecological succession in detail.
b) How bioindicator play role in pollution control?
c) Describe attributes of k-selected and r-selected species.



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SEAT No. :

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[Total No. of Pages : 2

[6070]-112

F.Y.M.Sc.

ENVIRONMENTAL SCIENCE

EVUT -112 : Environmental Physics & Chemistry

(2019 Pattern) (Semester - I) (Paper - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Solve any Five questions from Question No.2 to Question No.7.*

Q1) Attempt any five of the following.

[5×2=10]

- a) Define “Surface tension”.
- b) Give environmental significance of Nitrogen cycle.
- c) Define “Solubility product”.
- d) What is the use of chemical equations in chemical reactions.
- e) What is reversible reaction.
- f) Define “Radioactive decay”.

Q2) a) Write principle, Construction. Working & applications of HPLC. **[7]**

b) What is acid base reactions? **[5]**

Q3) a) Explain in detail about solubility of gases in water. **[7]**

b) What is “Aerodynamics” **[5]**

Q4) a) Explain in detail about X-ray fluorescence. **[7]**

b) Differentiate between cations & Anions in water. **[5]**

P.T.O.

Q5) a) Explain in detail technique of colorimetry give its limitations, merits & demerits. [7]

b) Differentiate between Reflection & Refraction. [5]

Q6) a) “Carbon cycle” [7]

b) Differentiate between Reversible & irreversible reactions. [5]

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

a) Sedimentation & Coagulation. [6]

b) Redox Reaction. [6]

c) Bon & CON [6]



Total No. of Questions : 7]

SEAT No. :

P-2589

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[6070]-113

M.Sc.

ENVIRONMENTAL SCIENCE

EVS-113UT : Earth, Ocean & Atmospheric Sciences

(2019 Pattern) (Semester - I)

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:

- a) Define Igneous Rock and give 2 example of extrusive Rock. [2]
- b) Classify chemical weathering with 1 example of each. [2]
- c) Enlist any 4 land capability classification. [2]
- d) What is Ekman spiral? [2]
- e) Give any 2 difference between climate & weather. [2]
- f) What do you mean by Hydraulic conductivity. [2]

Q2) a) Explain in detail the physical structure of ocean floor with neat labelled diagram. [7]

- b) What are wind belts? How pressure is responsible for formation of each belt. [5]

Q3) a) Describe walker circulation. How does temperature affect walker circulation. [7]

- b) Explain in detail Davis model of Erosion. [5]

Q4) a) Explain the incoming & outgoing energy balance. How Human activities influence the energy balance. [7]

- b) Discuss the factors responsible for degradation of soil quality. [5]

P.T.O.

- Q5)** a) What are Hydrological properties of rocks. Explain Darcy's law in detail.[7]
b) Define Precipitation. Write a note on forms of precipitation. [5]
- Q6)** a) Describe different erosional & depositional land forms. [7]
b) Explain watershed & write different characteristics of watershed area.[5]
- Q7)** Write short notes of any two of the following: [12]
a) Earthquake.
b) Exploitation of Earth resources.
c) Weather parameters.



Total No. of Questions : 7]

SEAT No. :

P-2590

[Total No. of Pages : 3

[6070]-114
M.Sc. (Semester - I)
ENVIRONMENTAL SCIENCE
EVSUT-114 : Environmental Statistics
(2019 Pattern)

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 range and what is its relative measure.
- b) The standard deviation calculated from set of 32 observations is 5. If the sum of the observations is 80, what is the sum of the squares of these observations?
- c) Define type I error and type II error in testing of hypothesis.
- d) What is classification? Name the types of classification.
- e) Define probability. In case of throwing of two dices, if number on second die is less than first, how many such cases would be there?
- f) Monthly consumption of electricity in units of certain family in year given as 210, 207, 315, 250, 240, 232, 216, 208, 215, 300, 290. Compute arithmetic mean and coefficient of range?

Q2) a) The mean weight of 150 students is 60 kg. The mean weight of boys is 70 kg with standard deviation of 10 kg. For girls, the mean weight is 55 kg and standard deviation is 15 kg. Find the number of girls and the combined standard deviation. **[7]**

b) What are measures of central tendency? How it is measured? Prove that **[5]**

$$\sum (x_i - \bar{x})^2 < \sum (x_i - A)^2$$

where $A \neq \bar{x}$

P.T.O.

Q3) a) What is correlation? State types of correlation, briefly explain scatter diagram method to measure correlation between two varieties. [7]

b) Using the following information you are required to obtain linear regression of mean defective parts delivered (in hundred units) y on mean expenditure incurred on inspection (in Rs. thousand) x . [5]

$$\Sigma x = 424, \Sigma y = 363, n = 10$$

$$\Sigma xy = 12815, \Sigma x^2 = 21926 \text{ and } \Sigma y^2 = 15123.$$

Q4) a) What is simple and multiple regression? Define partial correlation coefficient and multiple correlation coefficient. If there are three variables $X_1, X_2,$ and X_3 . express the multiple correlation coefficient at one variable with other two. If correlation coefficient between three variables X_1, X_2 and X_3 are $r_{12} = 0.70, r_{13} = 0.61$ and $r_{23} = 0.40$ respectively. What is value of $r_{12.3} = ?$ [7]

b) Following is a cumulative distribution table showing number of packages and number at times it was received by post office in 60 days. [5]

No. of packages (below)	10	20	30	40	50	60
No. of times received	17	22	29	37	50	60

Obtain the frequency table from it. Also prepare more than cumulative frequency table.

Q5) a) Define continuous random variable. Write down normal probability distribution and what is probability distribution when Z is standard normal variate? State any four properties of normal distribution. [7]

b) The correlation coefficient between the variables X & Y is 0.60; If $\sigma_x = 1.5, \sigma_y = 2.00, \bar{x} = 10$ and $\bar{y} = 20$ Find the equation of regression lines. [5]

- i) Y on X
- ii) X on Y

Q6) a) What is dispersion? Explain what you understand by absolute and relative dispersion. Describe some of the measures relative dispersion known to you. [7]

b) A set examination marks is approximately normally distributed with mean of 75 and standard deviation of 5. If top 5% of students get grade A and bottom 25% get grade F, what mark is the lowest A and what mark is the highest F? [5]

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

- a) Time series
- b) Measure of shewness and kurtosis
- c) Regression analysis



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[6070]-211

F.Y. M.Sc.

ENVIRONMENTAL SCIENCE

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

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Solve any five questions from Q.2 to Q.7.*
- 3) *Questions 2 to Q.7 carry equal marks.*

Q1) Answer any five of the following.

[10]

- a) Name the pollutant disposed through off shore drilling.
- b) What is sea water intrusion.
- c) What do you mean by Ballast water.
- d) Enlist chemical method to control marine pollution.
- e) What is application of piezometer.
- f) Give drinking water standard for chloride and TDS.

Q2) a) Explain all pollutants responsible for water pollution.

[7]

b) Write a note on Land subsidence.

[5]

Q3) a) Explain the numerical simulation for aquifer yield prediction.

[7]

b) Write the impact of hazardous solid waste on soil.

[5]

Q4) a) How mining activity causes soil deterioration.

[7]

b) Discuss any one case study related to groundwater pollution.

[5]

P.T.O.

- Q5)** a) Explain in detail consequences of marine water pollution. [7]
b) Write a note on effluent standards. [5]
- Q6)** a) How regulatory bodies help to prevent Groundwater Pollution. [7]
b) Describe about permeable reactive barrier. [5]
- Q7)** Write short notes on any two of the following. [12]
a) Method of wastewater disposal on soil.
b) Artificial Recharge
c) Bio-slurping



Total No. of Questions : 7]

SEAT No. :

P-2592

[Total No. of Pages : 2

[6070]-212

M.Sc. (Semester - II)

ENVIRONMENTAL SCIENCE

**EVSUT - 122 : Environmental Pollution - II : Air, Noise and Radiation
(2019 Pattern)**

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) Explain point source and non point sources with examples.
- b) What is meant by A weighted sound level?
- c) What are polar stratospheric clouds?
- d) What is AERB and what is its mission.
- e) Explain half life. How is it used?
- f) What is tinnitus and how is it caused?

Q2) a) What is the impact of meteorological parameters on dispersion of air pollutants. [7]

b) Name the major air pollution episodes across the world. Write in detail about the London Smog. [5]

Q3) a) Define noise. Enlist the strategies for noise control. Explain in detail about how the receiver can be protected. [7]

b) How does noise affect communication? What are the psychological effects of noise. [5]

P.T.O.

- Q4)** a) Which air pollution control equipment works on the principle of charge separation? Explain its major components, advantages & limitations. [7]
b) Explain how process modification zoning can help in air pollution control. Explain with example. [5]
- Q5)** a) How is radioactive waste classified? Explain with description. [7]
b) Explain the working and significance of personal dosimeters. [5]
- Q6)** a) What is the significance of respirable particulate matter? Add a note on the dust sampler. [7]
b) Write about the methods used for monitoring hydrocarbons. [5]
- Q7)** Write short notes on any two of the following : [12]
a) Noise control in transmission path with example.
b) Fundamental principles of ICRP guidelines for radiological protection.
c) Methods of cleaning fabric filters.



Total No. of Questions : 7]

SEAT No. :

P2593

[Total No. of Pages : 2

[6070]-213

M.Sc. - I

ENVIRONMENTAL SCIENCES

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 :

[5 × 2 = 10]

- a) Write the statement of Article 51A(g).
- b) What is the full form of CITES?
- c) Give any 2 Roles of CPCB under Water Act, 1974.
- d) Define sustainable development.
- e) What is main objective of CBD?
- f) Enlist any 4 principles of stockholm conference.

Q2) a) Explain the penalties for a company & the Government working against Air Act, 1981. **[7]**

b) Discuss the rules explained under Wildlife Act, 1972 for Hunting & Poaching of Animals. **[5]**

Q3) a) What are the fundamental Rights & duties for environment Protection? **[7]**

b) Discuss International Solar Alliance. **[5]**

Q4) a) Define the term Pollution. Discuss the provision relating to Prevention of water pollution under Water Act, 1974. **[7]**

b) Elaborate nature & scope of Environmental Law. **[5]**

P.T.O.

- Q5)** a) Explain silent principles of sustainable development. [7]
b) Discuss the duties of Central Government to take measures to protect & improve environment. [5]

- Q6)** a) Discuss the composition & duties of state board under Environment Protection Act, 1986. [7]
b) What are the causes of Environment Pollution? How does Environmental Law control the environmental pollution. [5]

- Q7)** Write short notes on any two of the following : [12]
a) Agenda 21.
b) MARPOL.
c) Batteries Act.



Total No. of Questions : 7]

SEAT No. :

P2594

[Total No. of Pages : 2

[6070]-214

M.Sc. - I

ENVIRONMENTAL SCIENCE

EVSUT - 124 : Water and 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) Attempt any five of the following.

[5×2=10]

- a) What are the importance of chlorination is wastewater treatment plant?
- b) Why secondary clarified sludge is recycled in aerobic reactor? What is role of methanogenic bacteria in anaerobic digestion.
- c) Define water treatment.
- d) Gives the factors affecting on sewage characteristics due to urbanization.
- e) Draw a sketch of any two types of aeration mechanism used in WTO with appropriate title.
- f) Gives two impacts of hard water.

Q2) a) Draw a flow chart of ASP and explain the importances of aeration. **[7]**

b) What is demineralization and explain its mechanism. **[5]**

Q3) a) Write a note on trackling filter and its working process. **[7]**

b) Brief a note on coagulation and sedimentation. **[5]**

Q4) a) Explain the importance of IS standards for drinking water and factors affecting per capita demand. **[7]**

b) Explain the role of microorganisms in anaerobic digestion. **[5]**

P.T.O.

- Q5)** a) What is RBC? Explain its function with sketch. [7]
b) Write a note on water born disease. [5]
- Q6)** a) Explain the incremental increase method in detail with example. [7]
b) Write a impacts of eletroplating industrial effluents and explain the cyanide removal mechanism. [5]
- Q7)** Write short notes on any two of the following. [12]
a) Chromium removal.
b) Recovery of chemical from black liquor.
c) Filtration in water treatment.



Total No. of Questions : 7]

SEAT No. :

P-2595

[Total No. of Pages : 2

[6070]-311

S.Y. M.Sc.

ENVIRONMENTAL SCIENCES

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

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Questions 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) Write about any two objectives of EIA.
- b) What is environmental audit?
- c) Why rule 14 of environment protection act 1986 is important?
- d) Write any two flaws of EIA process.
- e) Summarize the features of overlay method.
- f) As per generic structure of EIA report, chapter 3 describes what? Highlight its content.

Q2) a) Discuss the baseline data collection plan/method for ambient air and noise environment. **[7]**

b) Write about EIA legislation in India. **[5]**

Q3) a) Discuss the impact of coal based thermal power plants and suggest appropriate mitigation measures for the same. **[7]**

b) How EIA process fits into the frame work of sustainable development? **[5]**

P.T.O.

- Q4)** a) Elaborate public hearing process, as per EIA notification 2006. [7]
b) Discuss environmental impacts of township projects and suggest appropriate measures to prevent, control & mitigate negative impact. [5]
- Q5)** a) What is check list method of impact assessment? How it is used in the EIA report? [7]
b) Considering suitable example or activity discuss impact characterisation. [5]
- Q6)** a) Suggest appropriate environmental management plan for highway project. [7]
b) Discuss the concept of ISO 14000 and comment on role of env. audits in implimentation of this system. [5]
- Q7)** Write short notes on any two of the following : [12]
a) Screening and scoping stages of EIA process.
b) Pollution and hazardous waste audit.
c) Guiding principles of EIA.



Total No. of Questions : 7]

SEAT No. :

P-2596

[Total No. of Pages : 2

[6070]-312

S.YM.Sc.

ENVIRONMENTAL SCIENCE

EVSUT 232 : Remote Sensing & GIS

(2019 Pattern) (Semester - III) (Paper - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Solve any Five questions from Question No.2 to Question No.7.*
- 3) *Question No. 2 to Question No.7 carry equal marks.*

Q1) Attempt any FIVE of the following.

- a) What is the resolution of satellite sensors? [2]
- b) What are the 8 elements of aerial photography? [2]
- c) What are the 4 types of remote sensing? [2]
- d) What are the 3 remote sensing platforms? [2]
- e) What are types of aerial camera? [2]
- f) What are the 5 functions of GIS? [2]

Q2) Answer the following.

- a) What is the difference between GPS and IRNSS? [7]
- b) What is DEM and DSM in GIS? [5]

Q3) Answer the following.

- a) What are the applications of remote sensing and GIS in reducing disaster risk? [7]
- b) Which sensor is used for soil moisture sensor? [5]

P.T.O.

Q4) Answer the following.

- a) Explain the spatial analysis and its application? [7]
- b) How many types of Map projection are there? [5]

Q5) Answer the following.

- a) What is the difference between datum and projection and coordinate system. [7]
- b) What are the 3 methods of geo-referencing? [5]

Q6) Describe the following.

- a) GIS Applications. [7]
- b) Image rectification in GIS. [5]

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

- a) Application of RS in Geological application. [6]
- b) Uses of remote sensing and GIS in agriculture. [6]
- c) Factors governing in interpretability of Satellite image. [6]



Total No. of Questions : 7]

SEAT No. :

P-2597

[Total No. of Pages : 2

[6070]-313

S.Y. M.Sc.

ENVIRONMENTAL SCIENCES

**EVSUT-233 : Restoration Ecology & Watershed
Management**

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Questions 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) Enlist any 4 Biological measures of watershed harvesting.
- b) Write any 4 significance of Eco restoration.
- c) Write a example of recycling as a support system in restoration.
- d) Define contour Bunding.
- e) What is Infiltration capacity of soil.
- f) Write example of 4 plants used effectively for live hedging.

Q2) a) Explain design & Layout of watershed structures. **[7]**

b) Explain any one success story of watershed management. **[5]**

Q3) a) Discuss about the steps involved in restoration of a particular site. **[7]**

b) How can a degraded forest patch be restored? **[5]**

Q4) a) Justify the statement “Restoration ecology is need for hour”. **[7]**

b) Define watershed & write objectives of watershed. **[5]**

P.T.O.

- Q5)** a) How can coastal ecosystem be restored. [7]
b) Define Eco restoration & give it's Guiding Principles. [5]
- Q6)** a) What are the problems associated with Mangrooves ecosystem. [7]
b) Write the Methodology for investigation of surface spring. [5]
- Q7)** Write a short note on any two of the following : [12]
a) Insitu watershed conservation.
b) Continuous contour benches.
c) Watershed deterioration.



Total No. of Questions : 5]

SEAT No. :

P-2598

[Total No. of Pages : 2

[6070]-314

S.Y. M.Sc.

ENVIRONMENTAL SCIENCE

**EVSUT-235 : Environmental Management : EMS and LCA
(2019 Pattern) (Semester - III)**

Time : 2 Hours]

[Max. Marks : 70

Instructions to the candidates:

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

Q1) Answer any five of the following :

[5 × 1 = 5]

- a) EMS stands for
- b) Meaning of circular economy is?
- c) What do you mean by standard?
- d) What is Ecomark?
- e) Define environmental audit.
- f) Full form of EMAs is?

Q2) a) Write in detail tools of environment management system.

[6]

b) What is scope, goal and purpose of EMS.

[4]

Q3) a) Describe in detail goal, purpose and scope of LCA.

[6]

b) What are benefits and limitations of LCA?

[4]

Q4) a) Why we need to transform circular economy? How it affect on environment? Explain

[6]

b) What is environmental design? Write its principle and benefits.

[4]

P.T.O.

Q5) Attempt any two :

[10]

- a) Eco Labelling
- b) ISO 14000
- c) Environmental Design



Total No. of Questions : 5]

SEAT No. :

P-2599

[Total No. of Pages : 2

[6070]-315

M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT 236 : Environmental Resource Monitoring
(2019 Pattern) (Semester - III)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

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

Q1) Answer any five of the following :

[5 × 1 = 5]

- a) Enlist any two air monitoring instruments.
- b) What is Forest?
- c) Define water quality monitoring.
- d) Enlist layers of the atmosphere.
- e) Define Sound & Noise.
- f) What is DBH?

Q2) a) What is ambient air quality? Give the standards of air quality.

[6]

b) Define Noise. Explain the national standard for noise.

[4]

Q3) a) Explain the soil quality Indicators.

[6]

b) Explain steps of water quality monitoring.

[4]

Q4) a) How remote sensing and aerial photography is used in environmental resource monitoring?

[6]

b) Enlist the methods for measurement of volume of trees.

[4]

P.T.O.

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

[10]

- a) Soil Profile
- b) NAAQS
- c) General standard for effluent



Total No. of Questions : 7]

SEAT No. :

P2600

[Total No. of Pages : 2

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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 No. Q.1 is compulsory.*
- 2) *Solve any five questions from Q.2 to Q.7.*
- 3) *Questions 2 to Q.7 carry equal marks.*
- 4) *Figures to the right indicate full marks.*

Q1) Answer any five of the following.

[10]

- a) What are the functional elements of solid waste management system.
- b) Ultimate analysis of solid waste includes which parameters?
- c) What are the Environmental effect of improper waste management.
- d) What is separation? Enlist any two separation technique.
- e) Define composting & Pyrolysis
- f) Write down categories of bio-medical waste according to colour code.

Q2) a) Explain in detail chemical characteristics of solid waste.

[7]

- b) What are the different chemical treatment use for hazardous waste disposal? **[5]**

Q3) a) Explain in detail solid waste management in textile industry.

[7]

- b) What is the type based classification of solid waste? **[5]**

Q4) a) Explain in detail factors affecting solid waste management.

[7]

- b) Explain in detail about "Sanitary Landfilling" **[5]**

P.T.O.

Q5) a) What are the different components of collection facility. [7]

b) What is Bio-medical waste? Explain in detail about its classification. [5]

Q6) a) Explain the need of source reduction in waste management. [7]

b) What are the environmental & health impacts of solid waste? [5]

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

a) Drying & Dewatering

b) “3R Principal”

c) Transfer station



Total No. of Questions : 7]

SEAT No. :

P-2601

[Total No. of Pages : 2

[6070]-412

M.Sc. (Semester - IV)

ENVIRONMENTAL SCIENCE

EVSUT242 : Renewable and Non Renewable Energy

(2019 Pattern)

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.

[10]

- a) Define energy. Why is it necessary to conserve energy?
- b) Explain the benefits of generating energy from waste.
- c) Wind energy is generated from solar energy - explain.
- d) What is tidal barrage?
- e) Write about photovoltaics & their applications.
- f) Explain nuclear fission with example.

Q2) a) How is energy an indicator of development? What are the environmental impacts of energy use? **[7]**

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

Q3) a) Explain the difference between fracking and drilling. What are the advantages and negative impacts of fracking. **[7]**

b) Explain thermal conversion and biochemical conversion of biomass with examples. What are the products in each case? **[5]**

P.T.O.

- Q4)** a) What are the different ways of harnessing solar energy? What are the different application? [7]
- b) Write about nuclear fuels-their concentration, refining, fuel fabrication. [5]
- Q5)** a) Explain the principle of hydroelectricity generation. Describe the three types of hydroelectric plants. [7]
- b) Explain the structure of wind turbine. What are the requirements for a wind farm site. [5]
- Q6)** a) What are the problems associated with geothermal energy harnessing? Explain any one type of geothermal power plant. [7]
- b) Explain the different ways of utilizing ocean energy. [5]
- Q7)** Write short notes on any two of the following. [12]
- a) Ocean thermal energy conversion
- b) Impacts of nuclear energy usage
- c) Pyrolysis



Total No. of Questions : 5]

SEAT No. :

P2602

[Total No. of Pages : 1

[6070]-413

S.Y.M.Sc.

ENVIRONMENTAL SCIENCES

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 mean by hazard?
- b) What is risk identification?
- c) Define toxicity.
- d) What is mean by OSHAS 18001?
- e) What is Acute effect?
- f) Give two examples of waterborne bacteria.

Q2) a) Write note on importance at safety.

[6]

b) Describe importance of safety policy in industries.

[4]

Q3) a) What are various hazard reduction strategies?

[6]

b) Explain effects of heavy metals on human health?

[4]

Q4) a) Write note on ISO 45001 : 2018.

[6]

b) Explain study as a tool for maximizing production sustainable development.

[4]

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

[10]

- a) Role of WHO in disease prevention.
- b) Impact of Anti-Cancer drug on human health.
- c) Explain various factors influencing toxicity.



Total No. of Questions : 5]

SEAT No. :

P2603

[Total No. of Pages : 1

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S.Y.M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT-245 : Environmental Economics

(2019 Pattern) (Semester - IV) (CBCS)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

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

Q1) Answer any five of the following :

[5 × 1 = 5]

- a) What is Environmental Economics?
- b) What is benefit?
- c) Enlist any two economic instruments.
- d) What is social cost?
- e) Enlist any two renewable resources.
- f) GHI stands for?

Q2) a) Differentiate between renewable and non-renewable resources with examples. **[6]**

b) Write a short note on FDI. **[4]**

Q3) a) Write in brief how economy linked with environment. **[6]**

b) Explain in brief Market failure. **[4]**

Q4) a) “Valuation of natural resources is important while making Environmental Policies” Justify. **[6]**

b) Write in brief Externalities. **[4]**

Q5) Answer any two of the following :

a) “Environment and Economy are two side of single coin” Justify the statement. **[5]**

b) Renewable resources and its importance. **[5]**

c) Carbon credit. **[5]**



Total No. of Questions : 5]

SEAT No. :

P2604

[Total No. of Pages : 2

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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) *Solve any three questions from Question No 2 to Question No 5.*
- 3) *Question No 2 to Question No 5 carry equal marks.*

Q1) Attempt any five of the following.

- a) How does biotechnology relate to the environment? [1]
- b) Which plants are used in bioremediation of water? [1]
- c) What are the two sources of biofuels? [1]
- d) How nanotechnology can sustain a clean environment? [1]
- e) What is the source of Nanomaterial? [1]
- f) Why the angle is 2 theta in XRD? [1]

Q2) Answer the following.

- a) What are the tools required for recombinant DNA technology? [6]
- b) What is the temperature for PCR? [4]

Q3) Answer the following.

- a) Explain in detail next generation sequencing. [6]
- b) Why phytoremediation is useful for enviromnet? [4]

P.T.O.

Q4) Answer the following.

- a) What is the principle, construction, working and application of transmission electron microscope? [6]
- b) What are the major challenges to bioremediation? [4]

Q5) Write a short note on Any TWO of the following. [10]

- a) What are the nanomaterials used for environmental remediation.
- b) How does nanotechnology reduce pollution?
- c) What are the potential risks and benefits of nanotechnology.



Total No. of Questions : 5]

SEAT No. :

P2605

[Total No. of Pages : 1

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S.Y. M.Sc.

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) *Solve any three questions from Q. 2 to Q. 5.*

Q1) Attempt any five of the following.

[5×1=5]

- a) Which are the major sinks of carbon dioxide?
- b) Enlist any four climate change mitigation actions at organizational level.
- c) What are proxies of climate change?
- d) What was the level of CO₂ in pre-industrial era i.e. A.D.1750 and in year 1990?
- e) Enlist impact of climate change on health.
- f) Which are the sources of methane?

Q2) a) Explain the concepts of carbon and water footprint.

[6]

b) What is IPCC? Also write in detail about its role in climate change related conferences.

[4]

Q3) a) What is climate forcing? Discuss any two examples of it, in detail.

[6]

b) How is climate change likely to cause an impact on the agriculture sector?

[4]

Q4) a) Suggest climate change related mitigation measures for industry, agriculture and building sectors.

[6]

b) How is climate change likely to cause impact on marine and coastal areas?

[4]

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

[10]

- a) Global warming vs. global dimming.
- b) Paris agreement 2015.
- c) Evolution and mass extinction.

