Total No. of Questions : 7]

SEAT No. : ____

PA-3345

[Total No. of Pages : 2

[5916]-11

M.Sc.-I (Environmental Science)
EVSUT-111 : ENVIRONMENTAL BIOLOGY & BIODIVERSITY
(2019 Pattern) (Semester-I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

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

Q1) Solve any 5 of the following: **[10]**

a) Why are nutrient cycle also referred to as biogeochemical cycles? Explain.

b) Describe the incomplete ecosystem with an example.

c) Explain why ecological pyramid is usually upright with suitable example.

d) Why is the productivity of coral reefs usually maximum. Explain

e) Explain with suitable example of ectoparasite & endoparasite.

f) Define migration with any 4 factors responsible for it.

Q2) a) Earth itself is called as biosphere. Explain why. **[7]**

b) State how the constant internal environment is beneficial to organism.**[5]**

Q3) a) Ecotone sites are seen to be more diverse in nature explain with suitable example. **[7]**

b) Justify how energy flow supports the second law of thermodynamics in an ecosystem. **[5]**

Q4) a) Discuss various attributes of k-selected & r- selected species. **[7]**

b) Discuss animal behaviour in terms of deterrance, defence & reward.**[5]**

P.T.O.

Q5) a) Discuss the challanges & adaptation of life in aquatic biome with suitable example. **[7]**

b) List the different ways by which organism cope or manage with biotic stress in nature. **[5]**

Q6) a) Wetlands have special importance in ecosystem define& Explain its importance in detail. **[7]**

b) Explain food chain with its different types. **[5]**

Q7) Write short notes on any 2 of the following: **[12]**

a) Keystone species & its significance.

b) Write a short note on positive interactions between species.

c) Tragedy of Common with its impact on environment.

Total No. of Questions : 7]

SEAT No. : ____

PA-3346

[Total No. of Pages : 2

[5916]-12

M.Sc.-I (Environmental Science)

EVSUT-112 : ENVIRONMENTAL PHYSICS AND CHEMISTRY

(2019 Pattern) (Semester-I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

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

Q1) Solve any 5 of the following: **[10]**

a) What is mole ratio?

b) Why Gibbs energy is called free energy.

c) How does solubility of gas in water change with temperature.

d) Give difference between Nuclear Fission & nuclear fusion.

e) What are units of radiation exposure.

f) Define Adiabatic lapse rate.

Q2) a) Explain in detail with neat labelled diagram of AAS. **[7]**

b) Differentiate between unsaturated and saturated hydrocarbon. **[5]**

Q3) a) Explain in detail with neat labelled diagram ICPAES. **[7]**

b) Explain in detail with example of Mass Balancing. **[5]**

Q4) a) Explain theory of heat & kinetic energy. **[7]**

b) What are application of Nuclear energy. **[5]**

P.T.O.

Q5) a) Write a note on geometrical optics. **[7]**

b) What are application of quantam physics. **[5]**

Q6) a) Describe the theory of Doppler Effect. **[7]**

b) Explain the kinetic theory for interpretation of pressure and temperature. **[5]**

Q7) Write short note on any 2 of the following: **[12]**

a) Biological oxygen demand.

b) X-Ray Fluorescence

c) Elemental cycles of Nitrogen & Sulphur.

Total No. of Questions : 7]

SEAT No. :

PA-3347

[Total No. of Pages : 2

[5916]-13

M.Sc.-I

ENVIRONMENTAL SCIENCE

EVSUT 113 : Earth, Ocean and Atmospheric Sciences

(2019 Pattern) (Semester-I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any five questions from Q.2 to Q.7.***

Q1) Attempt Any five of the following

a) What are different types of Volcanoes.

b) Why are surface waves considered as more destructive

c) Explain how relative humidity effects transpiration rate.

d) What are continental margins.

e) Why is horizon E in soil profile called eluviation.

f) What are fronts?

Q2) a) Discuss in detail the factors influencing air temperature.

b) Summarize how vegetation plays significant role in hydrological cycle.

Q3) a) Explain in detail land capability classification.

b) Over exploitation of Earth Resources has lead to Environmental degradation Justify.

Q4) a) Discuss in detail the Human influence on radiation balance.

b) Clarify the statement " change in climate are interlinked with changes to hydrological cycle.

P.T.O.

Q5) a) Explain the vertical stratification of Oceanic water column.

b) Interpret the short term climatic effects.

Q6) a) What are erosional and depositional land forms.

b) Illustrate that global density gradient drives ocean circulation.

Q7) a) Indian Monsoon.

b) Soil profile.

c) Minerals.

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Total No. of Questions : 7]

SEAT No. :

PA-3348

[Total No. of Pages : 4

[5916]-14
M.Sc. - I
ENVIRONMENTAL SCIENCE
EVSUT - 114 : Environmental Statistics
(2019 Pattern) (Semester - I)

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 Q.2 to Q.7 carry equal marks.***

Q1) Solve any five of the following. **[5×2=10]**

a) Distinguish between primary and secondary data. State methods of collecting primary data.

b) Define statistical table. State various parts of table.

c) Find the mean and median of the following data

10, 12, 16, 10, 9, 5, 13, 10, 17.

If each value is increased by 5, what will be the new mean and median.

d) What is dispersion? State the absolute and relative measures of dispersion.

e) Coefficient of correlation between X and Y is 0.4 and their covariance is 12. The variance of Y is 25. Find the S. D of X.

f) What is time series? State examples of time series.

Q2) a) What is measure of location? State different measures of location and give properties of good measure. **[7]**

b) Define the skewness and kurtusis? How Skewness is measured by using moments? Under what conditions, the distribution become symmetrical? **[5]**

P.T.O.

Q3) a) What is classification? Explain the types of classification? State struges formula for calculation of number of classes. **[7]**

b) If the first quartile is 142 and the semi - inter quartile range is 18. Find the median assuming the distribution is symmetrical? **[5]**

Q4) a) Define standard deviation for frequency distribution? Describe the properties of standard deviation. **[7]**

b) The following information about employees of two factories is given **[5]**

	Factory A	Factory B
No. of employees	50	100
Mean wages in Rs. per employee	120	85
Variance of wages per employee	9	16

i) Which factory A or B has large wage bill?

ii) Which factory shows more variation?

Q5) a) State the equations of two lines of regression. What is regression coefficients? State formula for regression coefficient of y on x. If you are given $\bar{x} = 40,\ \bar{y} = 50,\ \sigma_x = 2.5,\ \sigma_y = 3.5$ and $r = 0.80$ calculate regression coefficient at X on Y? **[7]**

b) The weekly wage of 1,000 workers are normally distributed with mean of Rs. 70 and standard deviation of Rs. 5.

Estimate the number of workers whose weekly wages will be

i) between Rs. 70 and 72

ii) more than Rs. 80. **[5]**

Q6) a) What is correlation? State different types of correlation and explain any one of them with suitable example? Write down two properties of Karl Pearson's coefficient of correlation? **[7]**

b) Draw a size curve and find quartile deviation for the following data **[5]**

Marks less than	10	20	30	40	50
No. of students	20	47	101	145	160

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

a) Normal distribution.

b) Time series

c) Population growth model.

Total No. of Questions : 7]

SEAT No. :

PA-3349

[Total No. of Pages : 2

[5916] - 21

M.Sc. - I (Environmental Science)

EVSUT - 121 : WATER AND SOIL POLLUTION : MANAGEMENT AND MITIGATION

(2019 Pattern)(CBCS) (Semester-II)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

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

Q1) Answer Any five of the following: **[5×2=10]**

a) What are impact of pesticides on water quality.

b) How aquifer yield is predicted?

c) Is ballast water is fresh water?

d) Why are water absorbents used in control of marine pollution?

e) What are the impact of fly ash dumping on soil?

f) What are effects of soil pollution?

Q2) a) What is surface water pollution? Describe in detail radioactive pollution and their impacts on human health? **[7]**

b) Discuss the CPCB standards provided for industrial effluent? **[5]**

Q3) a) What is ground water restoration? Explain the strategies used for ground water bioremediation? **[7]**

b) What is induced infiltration method? What are causes of more infiltration of groundwater? **[5]**

P.T.O.

Q4) a) What is hazardous waste? How organic toxic substences are disposed scientifficall? **[7]**

b) What are remedial measure of freshwater pollution? **[5]**

Q5) a) What are the natural and artificial causes or land subsidences? **[7]**

b) How groundwater is monitored by using piezometer? **[5]**

Q6) a) Define oil spills? Explain the role of surfactant in remediation of oil spill site. **[7]**

b) What are the consequences of marine pollution. **[5]**

Q7) a) What happen when sewage is used for irrigation of soil? Does it made impact on groundwater. **[7]**

b) What is lime sludge of paper mill? How does liming affects the soil? **[5]**

Total No. of Questions : 7]

SEAT No. :

PA-3350

[Total No. of Pages : 2

[5916]-22

M.Sc. - I

ENVIRONMENTAL SCIENCE

EVSUT-122 : 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) ***Attempt any five questions from Q.2 to Q.7.***

Q1) Solve any five of the following. **[10]**

a) Describe Half-life period.

b) What is dB meter?

c) Describe 'A weighted sound level'.

d) Give the source based classification of air pollution.

e) What is radio activity? Which units used to measure it.

f) What is working principle of fabric filters?

Q2) a) How meteorological characters effects on dispersion of air pollutants? **[7]**

b) Enlist the major air pollution episodes & Write in details about any one of them. **[5]**

Q3) a) Define Noise, Write in brief about sources & effects of noise on human health. **[7]**

b) Write a note on G.M. counter. **[5]**

Q4) a) Describe the ambient NOX sampling & estimation method. **[7]**

b) Write about 'National Ambient Air Quality Standards' (NAAQS). **[5]**

P.T.O.

Q5) a) Define air pollution, add note on adverse effects of air pollutants on human health. **[7]**

b) Give the disposal methods of radio active waste. **[5]**

Q6) a) Write working principle, advantages & disadvantages with labeled diagram of wet scrubber. **[7]**

b) What are the mitigation measures of noise pollution? **[5]**

Q7) a) Comment on 'Absorption & vapour incineration' techniques used to control emission of gaseous pollutants. **[7]**

b) Write a short note on health hazards of ionic radiations. **[5]**

Total No. of Questions : 7]

SEAT No. :

PA-3351

[Total No. of Pages : 2

[5916]-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) ***Question 1 is compulsory.***
2) ***Attempt any five questions from Q.2 to Q.7.***
3) ***Figures to the right indicate full marks.***

Q1) Solve any five of the following. **[5×2=10]**

a) What is full form of CITES?

b) What is the most effective way to preserve Biodiversity?

c) In which year India launched its second edition of national forest policy?

d) The national action plant on climate change in India was launched on _____.

e) When did the CPCB established in India?

f) Why CITES formed?

Q2) a) Write in detail Rio +10 Summit held in 2002. **[7]**

b) Discuss the outcome of conference on human environment held at Stockholm. **[5]**

Q3) a) Write an account on role of constitution in environmental protection. **[7]**

b) Which are the fundamental rights conferred by the constitution of India to its citizens? **[5]**

Q4) a) Write in detail about section 21 of air act 1981 along with any other important two sections. **[7]**

b) Which are the provisions under forest act for conservation of forest in India. **[5]**

P.T.O.

Q5) a) How wildlife protection act 1972 helpful for conservation of wildlife & wild habitat? **[7]**

b) What are functions of CPCB & SPCB under air act 1981? **[5]**

Q6) a) Describe the salient features of national forest policy. **[7]**

b) What is E-waste? Explain with suitable examples. **[5]**

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

a) Ramsar convention

b) Cartagena protocol on Bio-safety.

c) Article 48 (A) & 51 A(g) in Indian constitution

Total No. of Questions : 7]

SEAT No. : ____

PA-3352

[Total No. of Pages : 2

[5916]-24

M.Sc. (Environmental Sciences)

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 Q2 to Q7.***

Q1) Answer any five of the following: **[5×2=10]**

a) Define a water treatment.

b) Aeration in water treatment plant.

c) What are the importance of chlorination in waste water treatment plant.

d) Importance of screening in water treatment plant.

e) Why water has odour? Write a note on odour removal system.

f) Give the difference between primary & secondary clarifier.

Q2) a) Explain a chromium and cyanide removal system from waste water. **[7]**

b) What is self-purification of water bodies? Explain with example. **[5]**

Q3) a) What is population forecasting? Explain the Arithmetic and Geometric increase method. **[7]**

b) Explain the steps involved in Anaerobic treatment, write a role of microorganisms. **[5]**

P.T.O.

Q4) a) Describe the clarification with diagram and its benefits. **[7]**

b) What is the basic criteria for designing of water treatment plant. **[5]**

Q5) a) What is the principle of water softening and brief the importance of water softening. **[7]**

b) Write a note on RBC. **[5]**

Q6) a) What are the sources of oil and grease, Total phosphrous, Nitrogen & Pottasium in sewage and explain their impacts on water bodies. **[7]**

b) What are the factors affecting on demand of drinking water. **[5]**

Q7) a) Explain Nitrification and de-nitrification in detail. **[7]**

b) Write down the treatment technology of Galvaizing Industrial effluent treatment plant. **[5]**

Total No. of Questions : 7]

SEAT No. :

PA-3353

[Total No. of Pages : 2

[5916]-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) ***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) Briefly write about scoping stage of EIA process.

b) What is ovelays method? Explain any two features of the same.

c) Explain any two operating principles of EIA.

d) Briefly write about elements of an audit process.

e) Why traffic data is required in the EIA process?

f) As per generic structure of EIA report, chapter 2 is relalted to what? Briefly cover its content.

Q2) a) Assess an impact of iron ore mining on environment including socio-Economic Environment. **[7]**

b) Discuss in detail about core values of EIA process. **[5]**

Q3) a) Identify impact of township projects on air, water & noise environment and suggest appropriate management plan for the same. **[7]**

b) What could be an impact of dam project on land use and soil environment? **[5]**

P.T.O.

Q4) a) Prepare an environment management plan for highway project. **[7]**

b) Elaborate the methodology for data collection on water environment and noise. **[5]**

Q5) a) Discuss ambient air quality monitoring plan for baseline data and post project monitoring - for a thermal power plant - with suitable justicat. **[7]**

b) Describe methodology of social impact assessment. **[5]**

Q6) a) Suggest risk & hazard assessment and management plan for industrial activities considering distillery of sponge iron industry as an example. **[7]**

b) With reference to EIA notification Sep. 2006, elaborate the process of public hearing. **[5]**

Q7) Write a short notes on any two : **[12]**

a) Environmental audit.

b) ISO 14000 system of environment management.

c) History of EIA process in India.

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Total No. of Questions : 7]

SEAT No. : ____

PA-3354

[Total No. of Pages : 2

[5916]-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) ***Question 1 is compulsory.***
2) ***Answer any 5 questions from Q.2 to Q.7.***

Q1) Answer any 5 out of the following : **[5 × 2 = 10]**

a) Give full forms of :

i) GIS and

ii) GPS

b) Define Georeferencing.

c) Give one point difference between Geoid, spheroid and ellipsoid shape of Earth.

d) Give one example of vector data : point, line and Polygon.

e) Define Atmospheric window.

f) Give statement and formula for Steffan and Boltzman Radiation law.

Q2) a) Define GIS. Explain component of GIS. **[7]**

b) Explain any 2 different types of datum. **[5]**

Q3) a) Describe in detail Elements of Photo Interpretation. **[7]**

b) Write a note on scattering as Interaction of EMR. **[5]**

P.T.O.

Q4) a) Explain in detail the types of orbit. **[7]**

b) Give Application of Rs. & GIS in wildlife management. **[5]**

Q5) a) Explain in detail Geometric features of Aerial Photograph. **[7]**

b) Explain Multispectral Remote Sensing. **[5]**

Q6) a) Define Map Projection. Explain the types of Projection. **[7]**

b) Write a note on Passive Remote sensing. **[5]**

Q7) Write short note on any two of the following : **[12]**

a) Factors governing Interpretability.

b) GPS

c) Active Remote sensing.

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Total No. of Questions : 7]

SEAT No. :

PA-3355

[Total No. of Pages : 2

[5916]-33

S.Y. M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT-233 : Restoration Ecology and Watershed Management

(2019 Pattern) (Semester - III)

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.***
3) ***Questions 2 to 7 carry equal marks.***

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

a) What are reference sites?

b) What is Assisted Natural Restoration?

c) What are contours?

d) What is a live hedge?

e) What is Integrated watershed management?

f) What are stream orders?

Q2) a) Describe the process of restoration of ecosystem on hills. **[7]**

b) Write a note on Principles of Eco-Restoration. **[5]**

Q3) a) Explain with suitable example monitoring techniques for effective restoration of river. **[7]**

b) Succession and Restaration are intrinsically linked justify. **[5]**

Q4) a) Discuss the methodology of investigation of surface springs. **[7]**

b) Justify modifications in cultivation practices can aid soil and water conservation. **[5]**

P.T.O.

Q5) a) Discuss the parameters for assessment of mining project site for restoration. **[7]**

b) Reference sites play significant role in Eco-Restoration. Justify. **[5]**

Q6) a) Discuss the significance of Eco-Restoration. **[7]**

b) Give a strategy to deal with groundwater depletion. **[5]**

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

a) Form ponds

b) Water balance and Hydrologic equation.

c) Avenue trees

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Total No. of Questions : 5]

SEAT No. :

PA-3356

[Total No. of Pages : 2

[5916]-34

M.Sc.

ENVIRONMENTAL SCIENCE

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

(2019 Pattern) (Semester - III) (2 Credits)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

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

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

a) What is sustainable development?

b) What is ISO 14000?

c) What is EIA?

d) What is linear economy?

e) What is Industrial ecosystem?

f) What is ecolabeling?

Q2) a) Give a brief account of UNDP support to Environment protection in India. **[6]**

b) Explain the term cost benefit analysis. **[4]**

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

b) Comment on life cycle analysis. **[4]**

P.T.O.

Q4) a) Discuss the relationship between energy & environment. **[6]**

b) Role of government in EMS implementation? Explain. **[4]**

Q5) a) What is the procedure for conducting Audit for EMS14001? **[5]**

b) What are the EMS standard? **[5]**

c) Comment on benefits & limitations of conducting LCA. **[5]**

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Total No. of Questions : 5]

SEAT No. :

PA-3357

[Total No. of Pages : 2

[5916]-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) ***Answer any Three questions form Q.2 to Q.5.***
3) ***Questions 2 to 5 carruy equal marks.***

Q1) Solve any five of the following : **[5]**

a) What do you mean by environmental monitoring?

b) Enlist any two weather monitoring parameters.

c) Define Noise and Vibration.

d) What is PM 2.5?

e) Why is environmental monitoring so important?

f) What is the purpose of water monitoring?

Q2) a) Explain the significance of SO_x & NO_x in air quality monitoring. **[6]**

b) Write note on water sampling. **[4]**

Q3) a) Stack monitoring - explain. **[6]**

b) Guidelines for handling and storage of soil samples. **[4]**

P.T.O.

Q4) a) What is HVS? Explain its working principles, uses with diagram. **[6]**

b) What are ambient noise standards? **[4]**

Q5) Write short note on any Two of the following: **[10]**

a) What do you mean by weather monitoring? Describe significance of light in weather monitoring.

b) Express your opinion on need of noise mitigation policy in India.

c) Describe measurement of volume of standing trees.

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Total No. of Questions : 7]

SEAT No. : ____

PA-3358

[Total No. of Pages : 2

[5916]-41
M.Sc. (Environmental Science)
SOLID AND HAZARDOUS WASTE MANAGEMENT
(2019 Pattern) (Semester - IV) (EVSUT 241)

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 collection. What are the occupational hazards associated with it?

b) Who is responsible for solid waste management?

c) Enlist the factors that affecting collection of waste.

d) Define composting.

e) Enlist the climate factors that affecting solid waste.

f) How can you contribute towords solid waste management?

Q2) a) Explain the adverse health & environmental impacts due to improper handling of solid waste. **[7]**

b) List out the factors to be considered in selecting solid waste collection equipment. **[5]**

Q3) a) Explain in detail type-base classification of solid waste. **[7]**

b) What is pyrolysis & types of pyrolysis? **[5]**

Q4) a) What is transfer station? What are the different types of transfer station. **[7]**

b) Define Incineration. What are the different types of incineration? **[5]**

P.T.O.

Q5) a) Explain in detail factors affecting the solid waste management system. **[7]**

b) Explain in detail 'plasma gasification'. **[5]**

Q6 a) What are the components of construction and demolition of waste? What are its impact on the environment? **[7]**

b) Explain in detail characteristics of Hazardous waste. **[5]**

Q7) a) Explain in detail different characteristics of waste. **[7]**

b) Write note on 'pyrolysis'. **[5]**

Total No. of Questions : 7]

SEAT No. : ____

PA-3359

[Total No. of Pages : 2

[5916] - 42

M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT 242 : Renewable & 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 Q.2 to Q.7.***

Q1) Attempt **Any Five** of the following : **[5 × 2 = 10]**

a) Define energy. What are the units of energy?

b) What is meant by renewably energy? Give examples.

c) Explain the term biofuel with examples.

d) What is Penstock?

e) What is energy plantation?

f) Explain about wave energy.

Q2) a) What is the impact of energy usage on the environment? How can it be reduced? **[7]**

b) Enlist the different sources of energy. Explain in detail about any one with advantages & limitations. **[5]**

Q3) a) What are fossil fuels? How are they classified? Give examples with characteristics. **[7]**

b) Elaborate on the different types of bio energy. **[5]**

P.T.O.

Q4) a) Write about the different ways in which solar energy can be harnessed. What are the applications? **[7]**

b) Explain the difference between nuclear fusion and fusion with reactions. Elaborate on how nuclear power is generated. **[5]**

Q5) a) Explain the principle of generation of hydroelectricity. Describe the 3 types of hydroelectric plants in brief. **[7]**

b) Explain how wind power is a form of solar energy. What are the advantages & limitations of wind energy? **[5]**

Q6) a) What is geothermal energy? Write in brief about the different designs of geothermal power plants. **[7]**

b) Explain how a tidal barrage works. What are the limitations? **[5]**

Q7) Write short notes on any two : **[12]**

a) Anaerobic digestion.

b) Decentralized energy generation.

c) Ocean thermal energy conversion.

Total No. of Questions : 5]

SEAT No. :

PA-3360

[Total No. of Pages : 2

[5916]-43
M.Sc. (Environmental Science)
EVSUT - 244 : ENVIRONMENTAL TOXICOLOGY, HEALTH AND SAFETY
(2019 Pattern) (Semester - IV)

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 from 2 to 5 carry equal marks.***

Q1) Solve any five of the following : **[5]**

a) What is the purpose of safety.

b) What are the 4 types of safety hazards.

c) What is full form of OSHA.

d) What are the toxicity parameters.

e) Which are the two types of toxicity.

f) Define ergonomics.

Q2) a) What are the salient features of the employees state insurance act? **[6]**

b) Explain impact of Biological Warfare. **[4]**

Q3) a) What is the importance of safeguards measures of ambient air quality. **[6]**

b) What is risk identification and assessment. **[4]**

Q4) a) What are the physical, chemical and biological hazards at work place. **[6]**

b) Briefly explain the OECD guidelines for toxicity. **[4]**

P.T.O.

Q5) Write any four short notes : **[10]**

a) Noise abatement

b) Methods of epidiomological studies

c) Physical hazards at work place

d) Types of mutagenesis

e) Indoor air pollution

□□□

Total No. of Questions : 5]

SEAT No. : [ ]

PA-3361

[Total No. of Pages : 2

[5916]-44

M.Sc. (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]**

a) Define environmental economics.

b) What is full form of GDP?

c) What is command?

d) Define economic growth.

e) What is FDI?

f) Define quality.

Q2) a) What are the reasons for market failure? Explain detail. **[6]**

b) Write scope and importance of environmental economics. **[4]**

Q3) a) Explain in brief problems related to design social cost. **[6]**

b) Write short note on Green GDP. **[4]**

P.T.O.

Q4) a) Write in detail economic growth and environment. **[6]**

b) How environment and economy linked together? Explain in brief. **[4]**

Q5) a) Write in brief global perspective of environmental economics. **[6]**

b) Differentiate between insentives and subsidies. **[4]**

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Total No. of Questions : 5]

SEAT No. : ____

PA-3362

[Total No. of Pages : 2

[5916]-45

M.Sc. (Part - II)

ENVIRONMENTAL SCIENCE

EVSUT - 247 : Environmental Biotechnology and Nanotechnology

(2019 Pattern) (CBCS) (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 the importance of biosafety.

b) What are 3 uses of recombinant DNA.

c) What is the purpose of mutagenomics?

d) What is PCR?

e) What is phytoremediation.

f) What are the types of biofuels.

Q2) a) What are the 7 steps in recombinant technology. Explain its advantage. **[6]**

b) What are the advantages of nano technology in agriculture and health. **[4]**

Q3) a) What is the process of phytoremediation Add a note on its type and examples. **[6]**

b) What is important in Xenobiotic degradation. **[4]**

P.T.O.

Q4) a) Briefly explain the mechanism of biofuel production. **[6]**

b) What are the steps in DNA sequencing. **[4]**

Q5) Write a short notes on : **[10]**

a) Bio leaching

b) Maxam - Gilbert method

c) Bio-monitors

d) Rhizofiltration

e) In-situ methods of bioremediation

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Total No. of Questions : 5]

SEAT No. : ____

PA-3363

[Total No. of Pages : 2

[5916]-46

M.Sc. (Semester - IV)

ENVIRONMENTAL SCIENCE

EVSUT - 248 : Environmental Policy, Climate Change & Sustainability

(2019 Pattern)

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) Write in brief about types of water foot prints.

b) Which are the major sinks of Carbondioxide?

c) What are geo-chemical proxies?

d) Which two sectors considered major contributor for carbon emissions?

e) What is global warming potential?

f) What was the CO_2 level in pre-industrial era & in 1990?

Q2) a) Discuss in detail the concept of carbon foot prints and write about carbon sequestration. **[6]**

b) What is UNFCCC? Explain its role in climate change mitigation. **[4]**

Q3) a) What are probable impact of climate change on coastal areas? **[6]**

b) Discuss the impact anticipated due to climate change on Indian Sub-continent. **[4]**

P.T.O.

Q4) a) Discuss existing & near feature key mitigation measures for transportation sector which is one of the major contributor of climate change. **[6]**

b) Write in detail about impact of climate change on water resources. **[4]**

Q5) Write a short note on any two : **[10]**

a) Paris agreement 2015

b) Global warming

c) Changing atmosphere and climate through geological time scale.

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