[5837]-101

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) Question 1 is compulsory.

2) Solve any five questions from Q2 to Q7.

3) Questions from 2-7 carry equal marks.

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

a) Justify why the climax phase is attended faster in secondary succession in comparison to the primary succession.

b) Explain what makes oceans ecosystem the least productive .

c) What is self sustainability? Explain with suitable example.

d) What are ecosystem? Explain with suitable example.

e) Explain why decomposition occurs at faster rate in trophics.

f) In the context of the transfer of energy in an ecosystem. What does '10 kg of deer's meat is equivalent to 1 kg of lions flesh' means?

Q2) a) Discuss the age pyramid of different population & write about the status of the population.   **[7]**

b) Discuss the tragedy of common with its impact on environment.   **[5]**

Q3) a) Classify the biomes with its climate & vegetation characteristics. **[7]**

b) Esturies are seen to have special importance in marine biome. Explain why? **[5]**

Q4) a) Carbon Cycle in nature is biogeochemical cycle. Explain. **[7]**

b) Discuss various stages in secondary succession. **[5]**

Q5) a) Human's architecture has been deeply inspired by nature. Discuss various animal architectures & its speciality. **[7]**

b) Enlist different ways in which organism cope or manage with abiotic stress in nature. **[5]**

Q6) a) Many birds are seen migrating across seas every year. Discuss the factors like orientation & navigation helping them in returning home. **[7]**

b) Explain the concept of bioindicator with suitable example & its significance. **[5]**

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

a) Discuss the concept of carrying capacity & factors determining the carrying capacity.

b) Genotype & Phenotype behaviour with suitable example.

c) Negative farm of interactions in organisms & its type & impact.

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[5837]-102

F.Y. M.Sc. (Environmental Science)
112: Environmental Physics and Chemistry
(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 Q2 to Q7.*
  3) *Question from 2-7 carry equal marks.*

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

  a) How many particle in mole?

  b) How does pressure affect Gibb's free energy?

  c) Why does increasing temperature increase solubility?

  d) Give any two applications of nuclear energy.

  e) Define Carnot Cycle.

  f) Explain in short Doppler effect.

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

  b) Differentiate between Cations and Anions in water _____.   **[5]**

Q3) a) Explain with neat labelled diagram spectroscopy _____.   **[7]**

  b) Explain in detail with example coagulation _____.   **[5]**

Q4) a) Give a detail account on Fresnel and Fraunhofer diffraction. **[7]**

b) Explain in detail Kinetic & Heat Energy. **[5]**

Q5) a) Write in brief about interaction of light with matter. **[7]**

b) Define lapse rate. Write short note on Adiabatic lapse Rate. **[5]**

Q6) a) Explain in detail Helmholtz and Gibbs free energy. **[7]**

b) Write Short Note on Quantum Physics. **[5]**

Q7) Write Short Notes on any two of the following : **[12]**

a) Chemical Oxygen Demand.

b) Flame Photometer.

c) Elemental cycles of Oxygen & Phosphorous.

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[5837]-103

M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT-113: Earth, Ocean and Atmospheric Science

(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) Question 2-7 carry equal marks.

Q1) Solve any Five of the following : **[5 × 2 = 10]**

a) Which geological features mark boundaries of lithospheric plates?

b) Define Orographic precipitation.

c) What are Mid Oceanic Ridges?

d) What is meant by laterization?

e) Difference between Weather and Climate.

f) What is relative humidity.

Q2) a) Describe the Internal Structure of Earth. **[7]**

b) Elaborate on Irrigation salinity. **[5]**

Q3) a) Explain types of plume with respect to atmospheric stability. **[7]**

b) Atmospheric winds affect Ocean currents. Justify. **[5]**

Q4) a) Discuss atmospheric chemical transport model. **[7]**

b) Give detailed comparison of dry and wet deposition of aerosols and gases. **[5]**

Q5) a) What are different soil types with respect to soil genesis. **[7]**

b) Explain the influence of Hadley cell on global ocean circulation. **[5]**

Q6) a) Discuss in detail process of mountain building. **[7]**

b) Explain the enhanced Green House Effect. **[5]**

Q7) Write Short Notes (any two) : **[12]**

a) Magnetic Field of Earth.

b) Urban Geology.

c) Drainage Basin and its characteristics.

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[5837]-104
M.Sc.
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 Q2 to Q7.
  3) Question 2 to 7 carry equal marks.

Q1) Solve any Five of the following :   **[5 × 2 = 10]**

  a) What is Skewness? What is relationship between mean, median & mode for negatively skewed distribution?

  b) What is coefficient of variation? State its importance?

  c) How are the mean and median affected when it is known that for group of 10 students scoring an average of 60 marks, the best paper was wrongly marked 90 instead of 65?

  d) Define r^{th} central and raw moments of X. State the relation between them.

  e) Define quartiles? How these values are calculated for continuous series?

  f) The standard deviation calculated from set of 32 observations is 5. If sum of the observations is 80. What is sum of squares of these observations?

Q2) a) What are the methods of data presentation? Present the following information in tabular form. The total no. of school going children in a village in 1980 was 500 of whom 100 were girls. Next year, the total strength increased by 10% but there was only 5% increase in no. of girls. In 1984 there were 580 school going children, the no. of boys exceeding the no. of girls by 360. **[7]**

b) State empirical relation between mean, median and mode. Find mode of the distribution whose mean is 26.8 and median is 27.6. Show that median lies between mean and mode. **[5]**

Q3) a) What is classification? What are the bases of classification? State the functions of classification. **[7]**

b) Calculate mean S.D and C.V. for the data X : 4, 5, 11, 9, 7, 7, 8, 10, 7, 4 if from each observation 2 is subtracted and then multiplied by 10. **[5]**

Q4) a) What is regression? Why there are two lines of regression? Describe the procedure to find the regression equation of Y on X. **[7]**

b) The local authorities in certain city installed 20,000 Sodium lamps in the main streets of city. The life of lamp is assumed to follow normal distribution with mean life of 1350 burning hours with standard deviation of 300 burning hours.

i) Find the no. of lamps expected to fail in first 900 hours.

ii) Find the period of burning hours before which 10% of lamps would have failed.

[5]

Q5) a) What is correlation? State the properties of Karl Pearson's coefficient of correlation. Define multiple correlation. If Y is dependent variable on two independent variables X_1 and X_2 respectively. Write formula of multiple correlation coefficient. If $r_{12} = 0.6$, $r_{13} = 0.7$ and $r_{23} = 0.65$ Find $R_{1.23}$? **[7]**

b) A sample of daily production rate of fibre body of Sports Car: 17, 21, 18, 27, 17, 21, 20, 22, 18, 23. The company production manager feels that standard deviation of more than three bodies a day indicates unacceptable production rate variations. State whether this is acceptable or not. **[5]**

Q6) a) What are causes of variation in production process? Describe procedure for drawing control charts for mean $(\bar{X})$ and range (R) and how to interpret it. **[7]**

b) Find the number of workers in wage group Rs. 30-40, if median wage is 33 for the following wage distribution.

Wages :	10-20	20-30	30-40	40-50	50-60
No. of workers :	18	23	–	15	14

[5]

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

a) Measures of Dispersion

b) Graphical methods of data presentation.

c) Time Series.

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[5837]-201

M.Sc. (Envioronmental Science)
EVSUT-121: Water and Soil Pollution: Management and Mitigation
(2019 Pattern) (Semester - II)

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

Instructions to the candidates:

   1)   *Question 1 is compulsory.*

   2)   *Answer any five questions from Q2 to Q7.*

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

   a)   What are characteristics of agriculture water?

   b)   What are the causes of groundwater depletion?

   c)   What are the four consequences of Marine pollution?

   d)   What are water skimmers?

   e)   What are the impact of lime sludge on soil?

   f)   How does heavy metals gets into the soil?

Q2) a)   How fresh water get polluted? Describe in detail biological pollutants and their impact on Human Health.   **[7]**

   b)   What is need of water quality standards? Give information of water quality standards.   **[5]**

Q3) a)   What is groundwater restoration? Explain ex-situ techniques used in groundwater remediation.   **[7]**

   b)   What is coastal aquifers? What causes salt water instrusion in to coastal aquifers?   **[5]**

P.T.O.

Q4) a) Explain in detail role of microorganism in heavy metal transformation.**[7]**

b) Discuss the specification of effluents to be disposed on land. **[5]**

Q5) a) Define Marine pollution? Explain in detail impacts of deep mining & oil extraction of Ocean. **[7]**

b) What is yield of aquifer? Add a note on slug and pumping test. **[5]**

Q6) a) What is microcosms in biology? Explain the role of microcosms in remediation of Marine pollution. **[7]**

b) What are chemical dispersant? How are chemical dispersants applied in remediation of Marine pollution? **[5]**

Q7) a) What is Industrial Solid waste? Add a detailed note on different fly ash disposal methods. **[7]**

b) What are the waste generated in paper & pulp industry and how does it causes pollution? **[5]**

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[5837]-202
First Year M.Sc.
ENVIRONMENTAL SCIENCE
EVSUT-122: Environmental Pollution II: Air, Noise and Radiation
(2019 Pattern) (Semester - II)

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

Instructions to the candidates:

1) *Question 1 is compulsory.*
2) *Answer any five questions from Q2 to Q7.*

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

   a) What is radioactive waste?

   b) Define 'Atmospheric stability'.

   c) What is Leq?

   d) What is radioactivity? Which units used to measure it?

   e) Give the composition of earth's atmosphere.

   f) What is working principle of cyclone separator?

Q2) a) Write in brief about formation & destruction of statospheric ozone. **[7]**

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

Q3) a) What is noise pollution? Write in brief about control strategies to reduce noise pollution. **[7]**

   b) What are the national standards of noise for various zones/area? **[5]**

P.T.O.

Q4) a) Write working principle, advantages & disadvantages with labeled diagram of ESP. **[7]**

b) Comment on 'NAAQS'. **[5]**

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

b) Give the classification of radioactive waste with it's description. **[5]**

Q6) a) Describe the ambient SOX sampling & estimation method. **[7]**

b) What are the vehicular pollution control strategies. **[5]**

Q7) a) Write about health hazards of ionic radiations & add note on Chernobyl accident. **[7]**

b) Write note on alternative fuel. **[5]**

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[5837]-203
M.Sc. (Semester - II)
ENVIRONMENTAL SCIENCE
EVSUT-123: Environmental Law, Ethics & Policy
(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) What is the full form of NEPA?

   b) Is an Environmental policy a legal requirement?

   c) Who is responsible for environmental protection?

   d) How many Ramsar sites have been declared so for in India?

   e) Why CITES formed?

   f) The concept of carbon credit discussed in _____ protocol.

Q2) a) Discuss in detail about international summit on human environment held at stockholm in 1972.   **[7]**

   b) Write in detail on Rio +5 conference.   **[5]**

Q3) a) Write in detail importance & difference between law & policy   **[7]**

   b) Write in short role of constitution in environmental protection.   **[5]**

Q4) a) Discuss the need of environmental (protection) Act 1986. **[7]**

b) Highlight the important section of water Act 1974. **[5]**

Q5) a) Discuss the objective of Kyoto protocol also explain its implementation mechanism. **[7]**

b) Define & Discuss the concept of environmental Ethics. **[5]**

Q6) a) Which are the issues/factors important for sustainable development. **[7]**

b) What is eco-sensitive zone. Write in detail. **[5]**

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

a) Convention on biological diversity.

b) MARPOL.

c) Basel Convention.

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[5837]-204

M.Sc. (Environmental Science)
EVSUT-124: Water & Wastewater 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)   What are the difference in UASBR & CSTR digester?

   b)   What is MBBR? Draw a appropriate sketch.

   c)   What are the effect of high organic load containing wastewater on water body.

   d)   Explain the sedimentation.

   e)   Explain the coagulation.

   f)   Write a note on chlorination.

Q2) a)   What are the sources of total Nitrogen, total Phosphorus & Potassium in sewage ? Explain their impacts.   **[7]**

   b)   Write down the importance of chlorination in WTP, give a types of chlorination.   **[5]**

Q3) a) Calculate the probable population by Geometric increases method by using following data. **[7]**

Year	Population
1940	8,000
1950	12,000
1960	17,000
1970	22,500

b) What is RBC? Write a note on its functioning. **[5]**

Q4) a) Draw a flow chart for pulp & paper industrial waste water treatment plant, explain a black liquor. **[7]**

b) Explain the needs of BIS standards. **[5]**

Q5) a) Give the detailed of Nitrification and De-nitrification. **[7]**

b) What are the impacts of Dairy industrial effluent. **[5]**

Q6) a) Explain the trickling filter, draw a sketch. **[7]**

b) What is the principle of water softening? Give its importances. **[5]**

Q7) a) Draw a flow chart of water treatment plant and give a brief description.**[7]**

b) Explain the conservancy system and it's demerits. **[5]**

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[5837]-301

M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT-231: Environmental Impact Assessment and 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 Q2 to Q7.*

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

a)   Briefly write about the link of EIA with international convention.

b)   Discuss any two flaws of EIA process.

c)   As per EIA notification Sep. 2006, explain the validity of environmental clearance for different category of projects.

d)   Write in brief about concept of ISO 14000 system.

e)   Briefly explain the requirement of rule 14 under Environment Protection Act 1986.

f)   What is ToR? Briefly explain its significance in the EIA process.

Q2)   a)   Discuss in detail, environmental impact of airport project and suggest appropriate mitigation plan for the same.   **[7]**

b)   Discuss the methodology of data collection for ambient air quality. **[5]**

Q3) a) What is Checklist method? How it is used in the EIA process? **[7]**

b) Explain public hearing procedure given in EIA notification Sep. 2006.**[5]**

Q4) a) Elaborate guiding principles of EIA. **[7]**

b) Discuss the impact characterization considering suitable activity. **[5]**

Q5) a) Suggest appropriate environmental management plan on ecology, biodiversity and socio-economy for a dam (irrigation) project. **[7]**

b) Define EIA concept, explain its objectives and now it supports sustainable development? **[5]**

Q6) a) Express your views on the argument that EIA is expensive process, it delays the project and misused to stop the development. **[7]**

b) What is environment audit? Discuss the basic structure of the audit. **[5]**

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

a) Screening and scoping stages of EIA process.

b) Environmental impacts of housing/township projects.

c) Pollution and hazardous waste audit.

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[5837]-302

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.   **[10]**

   a)   Define Remote Sensing.

   b)   Define spectral signature with one example.

   c)   Give fullforms of :-

       i)   DEM

       ii)   DBMS

   d)   Enlist 4 Photo interpretation element with example.

   e)   What the components of GIS.

   f)   Give two difference in Raster & Vector model.

Q2) a)   Draw neat labelled diagram of EMR spectrum and Explain it.   **[7]**

   b)   Write difference in Geosynchronous and sunsynchronous orbit.   **[5]**

Q3) a)   Define projection. Explain in brief types of Map Projection.   **[7]**

   b)   Explain in detail image Rectification technique.   **[5]**

Q4) a) Describe the application of Remote Sensing & GIS in Land use and Land cover. **[7]**

b) Explain the process of Digitization. **[5]**

Q5) a) Explain any 3 Elements of Photo Interpretation with example. **[7]**

b) Explain concept of GIS. Give details of component of GIS. **[5]**

Q6) a) Describe any 3 Radiation Law in detail. **[7]**

b) Explain in detail Shape of Earth. **[5]**

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

a) History of Remote Sensing.

b) Digital Elevation Model.

c) Image correction.

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[5837]-303

M.Sc. II
ENVIRONMENTAL SCIENCE
EVSUT - 233 : Restoration Ecology & Watershed Management
(2019 Pattern) (Semester - III)

Time : 3 Hours]   *[Max. Marks : 70*
Instructions to the candidates:
    1)   *Question 1 is compulsory.*
    2)   *Answer 3 any questions from Q2 to Q7.*

Q1) Answer any five of the following.

    a)   What is Miyawaki method.

    b)   Why are invasive plant and animals pose a challenge to restoration.

    c)   How does dredging facilitates river restoration.

    d)   What are drainage line surveys.

    e)   What are springs.

    f)   What is run off.

Q2) a)   Describe the process of restoration of Lakes.

    b)   Watershed management efficiency depends on various factors comment.

Q3) a)   Discuss in detail the traditional water Harvesting methods.

    b)   Gardens and Parks can help restore urban biodiversity Justify.

Q4) a)   Discuss in detail engineering survey involved in watershed development.

    b)   Threat assessment is important for successful restoration Justify.

Q5) a) Discuss in detail problems associated with watershed management.

   b) Give significance of waste water recycling in river restoration.

Q6) a) Give biological measures for water harvesting and its role.

   b) Elaborate on Ridge to Valley approach in watershed management.

Q7) a) Ecological Restoration.

   b) Restoration of Dumping grounds.

   c) Vertical distribution of ground water.

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[5837]-304
M.Sc.
ENVIRONMENTAL SCIENCE
EVSUT 235 : Environmental Management EMS & LCA
(2019 Pattern) (Semester - III)

Time : 3 Hours] *[Max. Marks : 35*
Instructions to the candidates:
    1)   Question 1 is compulsory.
    2)   Answser any 3 questions from Q2 to Q5.

Q1) Answer any five of the following. **[5×1=5]**

    a)   What is green industries?

    b)   What is LCA?

    c)   What is circular economy?

    d)   What is Ecomark?

    e)   What is WHO?

    f)   What is Environmantal Audit?

Q2) a)   Why do the manager need to study Environmental management. **[6]**

    b)   Comment on Environmental benefits of EMS. **[4]**

Q3) a)   Explain the costs associated with EMS. **[6]**

    b)   What is the importance of green economy? **[4]**

Q4) a) What is the role of NGO in environment protection? **[6]**

b) Justify the Environment & economy are the two sides of the same coin?**[4]**

Q5) **[10]**

a) Explain the international standard in EMS.

b) What is the role of ISO 14020? Explain.

c) Write any two case studies based on LCA.

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[5837]-305

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) Question 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]**

   a)   Why is air monitoring so important?

   b)   Enlist sources of noise pollution.

   c)   How does temperature influence water quality parameter?

   d)   What factors influence soil quality?

   e)   Why is forest monitoring important?

   f)   What is PM 10?

Q2) a)   Describe measurement of diameter & girth of trees.   **[6]**

    b)   Write note on scope of wildlife monitoring.   **[4]**

Q3) a)   Describe working principle, uses of HVS with diagram.   **[6]**

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

Q4) a) What is weather monitoring? Describe significance of temperature & pressure in weather monitoring. **[6]**

b) What are water quality parameters? **[4]**

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

a) How is stack monitoring done?

b) Explain need of noise mitigation.

c) Describe significance of pH in soil monitoring.

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[5837]-401

M.Sc. (Environmental Sciences)
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 solid waste. What are its environment at impacts?

    b)   What is separation or segregation? Enlist any two segregation technique.

    c)   Explain the composition of MSW.

    d)   Specify role of 'transfer station'.

    e)   How we can reduce the waste generation at source?

    f)   Differentiate between hazardous and non-hazardous waste.

Q2) a)   Explain in detail different characteristics of waste. **[7]**

    b)   What are the site selection criteria for the disposal of hazardous waste.**[5]**

Q3) a)   Sugar industry generated what type of solid waste? What are the ways of its disposal. **[7]**

    b)   What are the sources of Radioactive waste? How can we manage radioactive waste? **[5]**

Q4) a) What are the common methods of waste disposal. **[7]**

b) Explain in detail about Hauled container use in waste storage & collection.
[5]

Q5) a) Explain in detail different categories of Bio-medical waste. Explain any three disposal methods in detail. **[7]**

b) Which separation technique are suitable far the segregation of waste. Explain in detail with suitable Diagram. **[5]**

Q6) a) Identify the activities responsible for successfull implementation of collection system. **[7]**

b) Explain in detail '3R' principle. **[5]**

Q7) a) Describe the design & operation of a sanitary landfill with a neat sketch.**[7]**

b) Write note on 'RDF' system. **[5]**

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[5837]-402

M.Sc.

ENVIRONMENTAL SCIENCES

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 Q2 to Q7.*

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

   a)   Define Potential & kinetic energy.

   b)   What is the first law of thermodynamics.

   c)   What is the principle of mind energy generation?

   d)   Explain the advantages of energy from waste.

   e)   What is nuclear fusion? Explain with example.

   f)   Explain about tidal energy.

Q2) a)   Explain how energy is an indicator for development. Also describe its impact on environment.   **[7]**

   b)   Write about decentralized energy generation systems. Explain the advantages.   **[5]**

Q3) a)   Write about the environmental impacts of exploration, mining transport and use of fossil fuels.   **[7]**

   b)   Write a note on bio fuels and its types.   **[5]**

Q4) a)   How can solar energy be utilized for domestic use? Explain with examples.   **[7]**

   b)   Write about the different categories of nuclear waste and its disposal. **[5]**

P.T.O.

Q5) a) What are the environmental impacts of hydroelectricity generation? **[7]**

b) Explain the structure of a wind turbine in brief. What are the requirements for a wind farm site? **[5]**

Q6) a) What are the problems associated with harnessing geothermal energy? Add a note on geothermal energy prospects in India. **[7]**

b) Explain the different ways of utilizing ocean energy. **[5]**

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

a) Nuclear fuel cycle.

b) Renewable energy integration.

c) Run of river system.

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[5837]-403

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)   *Question 1 is compulsory.*

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

    3)   *Questions 2 to 5 carries equal makrs.*

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

    a)   What is importance of safety?

    b)   What are safety bazard examples.

    c)   What legislation covers PPE.

    d)   What are main objectives of OHS related legislation.

    e)   Define LC_{50} and LD_{50}.

    f)   Which is most common target organ in toxicity?

Q2) a)   What are the salient features of workmen compensation act.?   **[6]**

    b)   How the ergonomic will help in reducing risk factor.   **[4]**

Q3) a)   What are the disorder caused in plant by air pollutants.   **[6]**

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

Q4) a)   Discuss the role of WHO in COVID-19 Pondemic.   **[6]**

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

Q5) Write a short notes on any - Four   **[10]**

    a)   EC50

    b)   Mock drill

    c)   Carcinogenic compounds

    d)   Asbestosis

    e)   Mutagenecity

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[5837]-404

M.Sc.

ENVIRONMENTAL SCIENCE

EVSUT : 245 - Environmental Economics

(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 Q2 to Q5.*

Q1) Answer any five of the following.   **[5×1=5]**

   a)   What is scope of Environmental economics.

   b)   What is full form of NNP?

   c)   What is externalities?

   d)   FDI stand for -

   e)   What is inflow?

   f)   What is market?

Q2) a)   Explain in detail how economic instrument protect the environment. **[6]**

     b)   Write a note on theory of public good.   **[4]**

Q3) a)   What is market failure? Write in detail.   **[6]**

     b)   Write short note on Insentives & subsidies.   **[4]**

Q4) a)   What is social cost? Discuss the problems associated with it with suitable examples.   **[6]**

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

Q5) a)   Write in brief Indian prespective of environmental Economics.   **[6]**

     b)   What is public good? Explain with suitable examples.   **[4]**

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[5837]-405

M.Sc. - II

ENVIRONMENTAL SCIENCE

EVSUT : 247 - Environmental Biotechnology and 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.   **[5×1=5]**

   a)   Define Biosensor.

   b)   What is recombinant DNA.

   c)   Define Biomethonation.

   d)   Define PCR.

   e)   What is the purpose of mutagenomics.

   f)   Write the types of Biofuels.

Q2) a)   Briefly write the function of CSTR.   **[6]**

   b)   Briefly explain bioleaching.   **[4]**

Q3) a)   What is Xenobiotic degradation? Add a note on biomining.   **[6]**

   b)   What are the advantages of nanotechnology in health sector.   **[4]**

Q4) a)   What are the steps in DNA sequencing.   **[6]**

   b)   Explain the difference bioaugmentation and biostimulation.   **[4]**

Q5) Write short notes on any four. [10]

    a)   DNA Finger print

    b)   PCR

    c)   Biomonitor

    d)   Molecular cloning.

    e)   Rhizofiltration.

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[5837]-406
M.Sc.
ENVIRONMENTAL SCIENCE
EVSUT : 248 - Environmental Policy, Climate Change & 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 are direct greenhouse gasses?

    b)   What is the target of Paris agreement?

    c)   What is 'common but differentiated responsibility' under Kyoto protocol?

    d)   What is global dinoming?

    e)   Briefly write about carbon footprint concept.

    f)   Write in brief about tree rings as climate proxies.

Q2) a)   Discuss the probable impacts of climate change on human health & biodiversity.   **[6]**

    b)   Elaborate on the concept of water footprint and its importance with reference to the climate change.   **[4]**

Q3) a)   Discuss the role and effect of anthropogenic climate forcing's on climate change.   **[6]**

    b)   Discuss climate change related mitigation measures feasible at individual level.   **[4]**

Q4) a) Discuss significant impact anticipated due to climate change at global level. **[6]**

b) The 6ᵗʰ mass extinction could be human driven-justify. **[4]**

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

a) IPCC

b) Sources & sinks of greenhouse gasses.

c) Carbon sequestration & role of agriculture.

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