



SLR-MF – 371

Seat No.	
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**M.Sc. – I (Semester – II) Examination, 2016  
(New CBCS)  
ENVIRONMENTAL SCIENCE  
Paper – V : Biodiversity and Conservation**

Day and Date : Wednesday, 30-3-2016  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Question No. **1** is **compulsory**.  
4) Answer **any two** questions from **2, 3 and 4**.  
5) Answer **any two** short note questions from **5, 6 and 7**.  
6) Draw **neat** and labelled diagrams **wherever** necessary.

1. Choose a correct alternatives from the given options.
- 1) In situ conservation of biodiversity involves
    - a) Facilitating gene flow
    - b) Introduction of new genetic stock
    - c) Translocation of animals
    - d) All the above
  - 2) The movement of individuals into and out of population is caused by birth, death, immigration and emigration. Such a state denotes.
    - a) Population density
    - b) Population turnover
    - c) Regulation of population
    - d) Basic biotic school
  - 3) The biggest threat to a species is
    - a) Low reproductive rates
    - b) Disease
    - c) Loss of habitats
    - d) Alien, invasive species
  - 4) The major types of flora and fauna found in aquatic ecosystem are determined primarily by
    - a) temperature
    - b) salinity
    - c) pH
    - d) light
  - 5) The Biological Diversity Act came in force in India
    - a) 2002
    - b) 2004
    - c) 2000
    - d) 2006

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- 6) Which type of forest is found at an altitude of 5300 ft. chiefly on mountains of Himalayas and Nilgiri ?
- a) Dry deciduous forest                      b) Temperate forest  
c) Moist tropical forest                      d) Tropical moist deciduous forest
- 7) The allochthonous microorganism of an ecosystem are
- a) indigenous microorganism              b) migrant  
c) parasitic                                      d) pathogenic
- 8) The area where two major communities meet and blend together is termed as
- a) Ecotype                                        b) Biotype  
c) Ecotone                                        d) Meeting place
- 9) Synecology means study of the ecology of
- a) One species                                  b) A community  
c) Pathogenic organism                      d) Symbiotic species
- 10) Salim Ali centre for ornithology and natural history is located at
- a) Bombay                                        b) Thiruvananthapuram  
c) Coimbatore                                  d) Madras
- 11) Alpha diversity represents
- a) Species richness                            b) Species richness and evenness  
c) Species evenness                            d) Species richness and dominance
- 12) Populations of organisms living in aquatic life zones may be limited by
- a) Access to light                              b) Dissolved oxygen  
c) Nutrient availability                        d) All of the above
- 13) The state having the largest forest cover in India is
- a) Andhra Pradesh                              b) Orissa  
c) Maharashtra                                 d) Chattisgarh
- 14) The great Indian Rhino has its natural home in
- a) Kaziranga National Park                  b) Corbett National Park  
c) Sundarbans                                    d) Kanha National Park



2. Give an account of bio-geographic zones of India. **14**
  3. What is Biosphere reserve ? Write a short account of protected areas network of India. **14**
  4. What is unique of Indian biodiversity ? Is it under threat ? What steps are being taken to conserve biodiversity ? **14**
  5. Write a note on : **14**
    - 1) Biodiversity
    - 2) International conventions on biodiversity.
  6. Explain in brief on the following : **14**
    - 1) In-situ and Ex-situ conservation
    - 2) Ecosystem diversity.
  7. Write an account on the following : **14**
    - 1) Red data book
    - 2) Major forest types and distribution in India.
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**M.Sc. – I (Semester – II) (New-CBCS) Examination, 2016**  
**ENVIRONMENTAL SCIENCE**  
**Paper – VI :Analytical Techniques and Instrumentation**

Day and Date : Friday, 1-4-2016  
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions :**
- 1) Answer **any five** questions.
  - 2) **All** questions carry **equal** marks.
  - 3) Question **1** is **compulsory**.
  - 4) Answer **any two** questions from **2, 3, 4**.
  - 5) Answer **any two** questions from **5, 6, 7**.
  - 6) **Draw** neat and labeled diagrams **wherever** necessary.
  - 7) Scientific calculator is **allowed** for calculations.

1. Select correct answer among the following :

14

- 1) A high-powered microscope that produces image from scattered secondary electrons is
  - A) Fluorescence microscope
  - B) Intense scanning light microscope
  - C) Transmission electron microscope
  - D) Scanning electron microscope
- 2) Chromatography can be used to
  - A) Form mixtures
  - B) Change mixture compositions
  - C) Separate mixtures into pure substances
  - D) Separate elements
- 3) Nuclear magnetic resonances is a physical phenomenon in which nuclei in a magnetic field
  - A) Fully absorb the radiations
  - B) Only reflect electromagnetic radiation
  - C) Carry out changes in re-emitted radiation
  - D) Absorb the re-emit electromagnetic radiation



- 4) In gravimetric analysis \_\_\_\_\_
- A) Mass of a solution is used to calculate quantity of original analyte
  - B) Mass of a product is used to calculate quantity of original analyte
  - C) Mass of a product is used to calculate quantity of impurity
  - D) Mass of a product is used to calculate elemental concentration
- 5) In an electrolytic cell the electrode where electrons enter the solution is called \_\_\_\_\_ and chemical change that occurs at this electrode is called \_\_\_\_\_
- A) Anode, oxidation
  - B) Anode, reduction
  - C) Cathode, reduction
  - D) Cathode, oxidation
- 6) Which among the following produces changes in rotational, vibrational and electronic energy of the molecule ?
- A) IR region
  - B) UV region
  - C) NMR region
  - D) Microwave region
- 7) How should the concentration of a colorless sample be determined ?
- A) Using a UV spectrophotometer
  - B) Using a VIS spectrophotometer
  - C) Either a UV or VIS spectrophotometer
  - D) Using an indicator solution and pH paper
- 8) Re-emission of previously absorbed radiation is phenomenon of
- A) Scattering
  - B) Flame Photometry
  - C) Luminescence
  - D) Absorbance
- 9) Tesla is a unit used to express
- A) Frequency
  - B) Pressure
  - C) Voltage
  - D) Magnetic field strength



- 10) A Geiger-Muller tube is a
  - A) Gas ionization detector
  - B) Cloud chamber
  - C) Fluorescence detector
  - D) Photographic detector
  
- 11) Nuclear magnetic resonance is a physical phenomenon in which nuclei in a magnetic field
  - A) Fully absorb the radiations
  - B) Only reflect electromagnetic radiation
  - C) Carry out changes in re-emitted radiation
  - D) Absorb and re-emit electromagnetic radiation
  
- 12) X-ray diffraction can only be applied to
  - A) Gaseous materials
  - B) Solid, crystalline materials
  - C) Liquids compounds
  - D) Leachates
  
- 13) Inductively Coupled Plasma Mass Spectrometry or ICP-MS is an analytical technique used for
  - A) Elemental determinations
  - B) Isotope determination
  - C) Compound identification
  - D) Functional group identification
  
- 14) Which of the following statements about SDS polyacrylamide gel electrophoresis is correct ?
  - A) Proteins can be tested for their biological activity after separation by gel electrophoresis
  - B) Proteins are solubilized but not denatured when separated
  - C) SDS polyacrylamide gel electrophoresis separates proteins on the basis of nature
  - D) SDS polyacrylamide gel electrophoresis separates proteins on the basis of size



2. What is analytical chemistry ? Discuss in detail any two chromatographic techniques with principle, instrumentation and applications. **14**
  3. Discuss the importance of various advanced analytical instrumental techniques in pollution monitoring with reference to water quality ? **14**
  4. Discuss the principle, important parts, working and applications of X-ray diffraction technique with suitable diagram. **14**
  5. Write short notes on the following : **14**
    - A) Inductively coupled plasma mass spectrometry.
    - B) Micrometry and importance in environmental studies.
  6. Write in brief on the following : **14**
    - A) What is the significance of electrophoresis techniques ? Elaborate on gel electrophoresis technique.
    - B) Explain detail principle, important components and applications of Atomic Absorption Spectrophotometry ?
  7. Write an account on the following : **14**
    - A) What is gravimetric analysis ? How these techniques are useful in water analysis ?
    - B) Discuss the applications of SEM and TEM in the study of surfaces.
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**M.Sc. – I (Semester – II) (New) (CBCS) Examination, 2016  
WATER AND WASTE WATER ENGINEERING (Paper – VII)  
Environmental Science**

Day and Date : Monday, 4-4-2016

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Question **1** is **compulsory**.  
4) Answer **any two** questions from **2, 3, 4**.  
5) Answer **any two** short note questions from **5, 6, 7**.  
6) Draw **neat** and labeled diagrams **wherever** necessary.

1. Fill in the blanks :

14

- 1) Per capita demand of water of city having population between 100,000 – 300,000 is \_\_\_\_\_  
a) 150 – 180 lit./day/capita                      b) 180 – 210 lit./day/capita  
c) 210 – 240 lit./day/capita                      d) 240 – 270 lit./day/capita
- 2) The most common cause of acidity in water is \_\_\_\_\_  
a) carbon dioxide      b) oxygen      c) hydrogen      d) nitrogen
- 3) Chlorine is used in the treatment of sewage to \_\_\_\_\_  
a) help grease separation  
b) aid flocculation  
c) increase the biochemical oxygen demand  
d) cause bulking of activated sludge
- 4) Composting and lagooning are the methods of \_\_\_\_\_  
a) sludge digestion                      b) sludge disposal  
c) sedimentation                      d) filtration
- 5) Rapid gravity filter used for \_\_\_\_\_  
a) Dissolve organic matter                      b) Dissolved solids  
c) Dissolve gases                      d) Bacteria and colloid solids

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- 6) 'Chlorine' demand of water is equal to \_\_\_\_\_
- a) applied chlorine
  - b) residual chlorine
  - c) sum of residual chlorine
  - d) difference of applied and residual chlorine
- 7) Which of the chemical used for dechlorination \_\_\_\_\_
- a) Carbon dioxide
  - b) Bleaching Powder
  - c) Sulphur Oxide
  - d) Chloramines
- 8) Standard BOD measures at \_\_\_\_\_
- a) 20 C
  - b) 25 C
  - c) 30 C
  - d) 35 C
- 9) The ratio of 5 day BOD to ultimate BOD is \_\_\_\_\_
- a) 1/3
  - b) 2/3
  - c) 3/4
  - d) 1.0
- 10) The per capita consumption of a locality is affected by \_\_\_\_\_
- I. Climatic Condition
  - II. Quality of Water
  - III. Distribution Pressure
- a) Only I
  - b) Only I and II
  - c) Both I and III
  - d) All I, II and III
- 11) Which of the following causes a decrease in per capita consumption \_\_\_\_\_
- a) user of metering system
  - b) good quality of water
  - c) better living standards
  - d) hotter climate
- 12) As compare to geometric increase methods of forecasting population, arithmetic increase methods gives \_\_\_\_\_
- a) lesser values
  - b) higher values
  - c) same values
  - d) accurate values
- 13) Which is not waterborne disease \_\_\_\_\_
- a) dysentery
  - b) cholera
  - c) typhoid
  - d) malaria
- 14) The overflow rate of plain sedimentation tank is about \_\_\_\_\_
- a) 500 – 700 L/H/M<sup>2</sup>
  - b) 1000 – 1250 L/H/M<sup>2</sup>
  - c) 1250 – 1500 lit./hr/m<sup>2</sup>
  - d) 1500



2. Explain in brief the designing aspects of RBC. **14**
  
  3. What are the demerits of open land filling process of industrial solid waste management practices ? **14**
  
  4. What are the types of bioremediation ? Add a note on bioleaching of heavy metals. **14**
  
  5. Sketch a neat labeled diagram of : **14**
    - A) Grit Chamber
    - B) Oxidation pond.
  
  6. Write principle and application of : **14**
    - A) PACT
    - B) Open Hearth Incinerators.
  
  7. Write the significance and methods of : **14**
    - A) Dewatering of sludge.
    - B) Conditioning of sludge.
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**M.Sc. I (Semester – II) (New-CBCS) Examination, 2016  
ENVIRONMENTAL SCIENCE (Paper – VIII)  
Remote Sensing and GIS in Environmental Science**

Day and Date : Wednesday, 6-4-2016  
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions :** 1) Answer **any five** questions  
2) **All** questions carry **equal** marks.  
3) Question **1** is **compulsory**.  
4) Answer **any two** questions from **2, 3, 4**.  
5) Answer **any two** questions from **5, 6, 7**.  
6) Draw **neat** and labelled diagrams **wherever** necessary.  
7) Calculator is **allowed** for calculations.

1. Solve correct answer among the following : 14
- 1) The basic requirement of any sensor system, is
    - a) radiometric resolution
    - b) spatial resolution
    - c) spectral resolution
    - d) none of the above
  - 2) Which one of the following helps to identify the objects on the earth surface ?
    - a) atmospheric window
    - b) signature
    - c) radiometric error
    - d) none of these
  - 3) Which one of the following statements is correct ?
    - a) During the day, earth reflects solar radiation
    - b) During the day, earth reflects both solar radiation the emission from its surface
    - c) During the night, earth emits radiation from its surface
    - d) All of these
  - 4) Remote sensing techniques makes use of the properties of \_\_\_\_\_ emitted, reflected or diffracted by the sensed objects.
    - a) electric waves
    - b) sound waves
    - c) electromagnetic waves
    - d) wind waves



- 5) Which one of the following statements regarding remote sensing is correct ?
- a) The interaction of the electromagnetic radiation with the target
  - b) The emission of electromagnetic radiation from the target
  - c) Both a) and b)
  - d) Neither a) nor b)
- 6) Which of the following are key application disciplines for GIS ?
- a) Astronomy
  - b) Environmental sciences
  - c) Commerce and business
  - d) Civil Engineering
- 7) Which of the following list is the key area of GIS functionality missed out by the above definition ?
- a) Re-projection
  - b) Analysis
  - c) Collation
  - d) Mapping
- 8) Which of the following are essential components of a GIS ?
- a) Appropriate GIS software
  - b) Data input and output devices such as digitizers/scanners and printer/plotters
  - c) A computer with sufficient memory and processing power to run the software
  - d) A fast internet connection
- 9) The interaction of the electromagnetic radiation produced with a specific wave length to illuminate a target on the terrain for studying its scattered radiance, is called
- a) passive remote sensing
  - b) active remote sensing
  - c) neutral remote sensing
  - d) none of these
- 10) Repetitive observations of the same area at equal interval of time, are useful to monitor the dynamic phenomena
- a) Cloud evolution
  - b) Vegetative cover
  - c) Snow cover
  - d) None of the above
- 11) A passive sensor uses
- a) sun as the source of energy
  - b) flash light as a source of energy
  - c) its own source of energy
  - d) none of these
- 12) The infrared portion of EMR lies between
- a) 0.4 – 0.7  $\mu$  m
  - b) 0.5 mm to 1 m
  - c) 0.7 – 1.3  $\mu$  m
  - d) 0.7 to 14  $\mu$  m



- 13) Who coined the term, 'Remote sensing' ?
    - a) Evelyn L. Pruitt, a geographer
    - b) Gaspard Felix Tournachon, a French scientist
    - c) Wilbur Wright, an Italian scientist
    - d) None of these
  - 14) Electromagnetic spectrum contains
    - a) gamma rays (wavelength  $< 10 - 10$  m)
    - b) ultraviolet rays (wavelength  $< 10 - 6$  m)
    - c) infrared rays (wavelength  $< 10 - 4$  m)
    - d) none of the above
  - 2. Write a brief account on element of image interpretation. **14**
  - 3. Give detail explanation on types of sensor and cameras. **14**
  - 4. What do you mean by topology ? Explain in detail advantages of topology. **14**
  - 5. Write a short note on the following : **14**
    - A) EM spectrum
    - B) Manipulation of data in GIS.
  - 6. Write in brief on the following : **14**
    - A) Raster data model
    - B) Application of GIS.
  - 7. Write an account on the following : **14**
    - A) Node and Vertices
    - B) Processes of sensor and its characteristics.
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**M.Sc. – II (Semester – III) (New) (CGPA) Examination, 2016**  
**ENVIRONMENTAL SCIENCE**  
**Paper – IX : Environmental Pollution**

Day and Date : Tuesday, 29-3-2016

Total Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Question 1 is **compulsory**.  
4) Answer **any two** questions from 2, 3, 4.  
5) Answer **any two** questions from 5, 6, 7.  
6) Draw **neat and labeled** diagrams **wherever** necessary.

1. Choose a correct alternatives from the given options :

14

- 1) Photochemical smog is related to the pollution of  
a) Soil                      b) Water                      c) Noise                      d) Air
- 2) Ozone layer in Stratosphere is affected by  
a) Excess CO<sub>2</sub>                      b) Excess CO  
c) CFC                      d) Low rainfall
- 3) The Noise created at the launching of space rocket measured around is  
a) 120 db                      b) 150 db                      c) 180 db                      d) 240 db
- 4) The major contributor of Carbon Monoxide is  
a) Motor Vehicle                      b) Industrial processes  
c) Stationary fuel combustion                      d) None of the above

P.T.O.



- 5) The Maximum biomagnifications would be in which of the following in case of aquatic ecosystem ?
- a) Fishes
  - b) Birds
  - c) Zooplanktons
  - d) Phytoplanktons
- 6) Water pollution leads to \_\_\_\_\_
- a) Increase oxygenation
  - b) Increases turbidity and deoxygenation
  - c) Increase Photosynthesis
  - d) Decreases turbidity
- 7) Why DDT is banned ?
- a) Long persistence in the Environment
  - b) Highly toxic to human
  - c) Used against mosquito killing
  - d) None of the above
- 8) According to WHO maximum permissible limit of Iron (Fe) in drinking water is
- a) 1 mg/l
  - b) 5 mg/l
  - c) 1.5 mg/l
  - d) 2.5 mg/l
- 9) Water Holding capacity is the highest in
- a) Sandy Soil
  - b) Clayey Soil
  - c) Loamy Soil
  - d) Mixture of Sand and Loam
- 10) For domestic drinking water supply the TDS should not exceed
- a) 250 ppm
  - b) 500 ppm
  - c) 600 ppm
  - d) 1000 ppm
- 11) Partially biodegradable plastics are made from
- a) Polyethylene and rubber
  - b) Corn starch and plastics
  - c) Cellulose and plastics
  - d) Polystyrene with saw dust





- 12) Composting and lagooning are the methods of
- a) Filtration
  - b) Sewage disposal
  - c) Sedimentation
  - d) Sludge digestion
- 13) Which one of the group of plants is most resistant to ionizing radiations
- a) Coniferous forest
  - b) Grasslands
  - c) Lichens and Mosses
  - d) Mixed forest
- 14) Biomedical waste may be disposed of by
- a) Incineration
  - b) Autoclaving
  - c) Land filling
  - d) Both b) and c)

2. What is Air pollution ? Give its sources and effects on Human and Vegetation in brief. **14**
3. Define Water pollution. Explain the Water pollution monitoring methods in detail. **14**
4. Write in detail account on Soil pollution problems and illustrate the remedial measures. **14**
5. Write a note on : **14**
- 1) Noise exposure level and standards.
  - 2) Water quality standards.
6. Explain in brief : **14**
- 1) Conversion of solid waste to energy.
  - 2) Biomedical waste.
7. Write an account on : **14**
- 1) Radiation hazard.
  - 2) Oil pollution control measures.
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**M.Sc. II (Semester – IV)(New CGPA) Examination, 2016  
ENVIRONMENTAL SCIENCE (Paper – XIII)  
Environmental Policy, Acts, Laws and Environmental  
Management System**

Day and Date : Wednesday, 30.3-2016

Total Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions :** A) Answer **any five** questions.  
B) **All** questions carry **equal** marks.  
C) Question No.1 is **compulsory**.  
D) Attempt **any two** from Q. No. 2, 3 and 4.  
E) Attempt **any two** from Q. No. 5, 6 and 7.

1. Fill in the blanks using correct choice.

14

- 1) The world as World Environmental day is celebrated on \_\_\_\_\_  
a) December 1    b) June 5    c) November 14    d) August 15
- 2) The Stockholm Conference was held in \_\_\_\_\_  
a) 1973    b) 1980    c) 1972    d) 1975
- 3) The provisions of environmental protection in the constitution were made under \_\_\_\_\_  
a) Article 5-A    b) Article 21-B  
c) Article 27-B (h)    d) Article 48-A and Article 51-A (g)
- 4) Red data book is published by \_\_\_\_\_  
a) IUCN    b) WWF    c) BNHS    d) WHO
- 5) UNCED stands for \_\_\_\_\_  
a) United Nations Conference on Environment and Development  
b) United Nations Convention on Environment and Development  
c) United Nations Conference on Energy and Development  
d) Union National Conference on Environment and Development

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3. Name some of the Conferences. Explain the principles for stockholm conference. **14**
  4. Discuss the Environmental laws in India. **14**
  5. Write short notes on : **14**
    - a) CPCB
    - b) Environmental Monitoring.
  6. Give a brief account of **14**
    - a) Ethics and Environment
    - b) Montreal Protocol.
  7. Write short notes on : **14**
    - a) Application of Remote Sensing and GIS in Environmental Management.
    - b) Environmental Management system.
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**M.Sc. – II (Semester – IV) Examination, 2016**  
**ENVIRONMENTAL SCIENCE (New – CGPA)**  
**Paper – XIV : Environmental Toxicology and Safety**

Day and Date : Friday, 1-4-2016

Total Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Question **1** is **compulsory**.  
4) Answer **any two** questions from **2, 3, 4**.  
5) Answer **any two** questions from **5, 6, 7**.  
6) Draw **neat** and labeled diagrams **wherever** necessary.

1. Solve correct answer among the following :

14

- 1) Lead particles in the atmosphere mainly come from
  - a) Vehicular pollution
  - b) Water pollution
  - c) Industrial waste
  - d) All of these
- 2) Chlorosis is referred to
  - a) The killing of tissue
  - b) Destruction of leaf tissue
  - c) Severe drying
  - d) The reduction of the chlorophyll from leaf
- 3) Aluminum is more toxic in aquatic environment at pH value
  - a) 5
  - b) 7
  - c) 5.7
  - d) 6
- 4) The metal species causing damage to the blood is
  - a) Ca
  - b) Pb
  - c) Mg
  - d) Ar
- 5) \_\_\_\_\_ is the most fatal pollutant in water.
  - a) Zn
  - b)  $PO_4$
  - c) Ar
  - d)  $CO_2$



- 6) Lead presence of in water can cause \_\_\_\_\_ to the human being.
- a) Kidney damage
  - b) Hair falling
  - c) Eye disease
  - d) Minamata's disease
- 7) Calcium is one of the important constituents in living organisms as it is found in
- a) Brain cells
  - b) Nervous system
  - c) Lungs
  - d) Bone and shells
- 8) Coal mine workers are prone to victims of one of the following disease
- a) Pneumoconiosis
  - b) Byssinosis
  - c) Asbestosis
  - d) Silicosis
- 9) The faecal indicator bacteria is
- a) *S. aureus*
  - b) *S. faecalis*
  - c) *E. coli*
  - d) *S. typhi*
- 10) Tuberculosis is \_\_\_\_\_ diseases.
- a) Air borne
  - b) Water borne
  - c) Soil borne
  - d) Sewage borne
- 11) The causative agent of Mumps disease is \_\_\_\_\_
- a) Bacterium
  - b) Virus
  - c) Protozoa
  - d) Actinomycetes
- 12) Which of the following does not include in ecological monitoring in the assessment of effect of toxicants ?
- a) Bioaccumulation
  - b) Bioassay
  - c) Ecological population dynamics
  - d) Habitat protection
- 13) Which pollutant among the following is the most destructive to the nerves system ?
- a) SO<sub>2</sub>
  - b) CO
  - c) Lead
  - d) All of these
- 14) The disciplines which studies the effect of chemicals on entire ecosystem, is referred as
- a) Ecotoxicology
  - b) Immuno toxicology
  - c) Behavioral ecology
  - d) None of these



2. Define toxicology. What are the various approaches to this disciplines of environmental science ? Discuss with examples. **14**
  3. What do you understand by bioassay ? Give in detail design protocols to evaluation of toxicants. **14**
  4. Discuss the toxic responses of the respiratory system. **14**
  5. Write a short note on following : **14**
    - A) Spermatogenesis
    - B) Hallucinogens.
  6. Write in brief on the following : **14**
    - A) Ecotoxicology
    - B) Environmental Stress.
  7. Write an account on the following : **14**
    - A) Role of management in industrial safety.
    - B) Industrial hazards.
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**M.Sc. – II (Semester – IV) (New) (CGPA) Examination, 2016**  
**ENVIRONMENTAL SCIENCE**  
**Paper – XV : Watershed Management**

Day and Date : Monday, 4-4-2016

Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- Instructions:** A) Answer **any five** questions.  
B) **All** questions carry **equal** marks.  
C) Question No. **1** is **compulsory**.  
D) Attempt **any two** from Q.No. **2, 3** and **4**.  
E) Attempt **any two** from Q.No. **5, 6** and **7**.

1. Choose correct alternative for the following : **14**
- 1) Which type of water exists as continuous film around the soil particles ?  
a) Gravitational      b) Capillary      c) Pellicular      d) Hygroscopic
  - 2) The sphere of living matter which includes soil on the surface of the earth  
a) Hydrosphere      b) Lithosphere      c) Biosphere      d) Atmosphere
  - 3) Cook's method is most suitable for watersheds up to about \_\_\_\_\_ for soil conservation.  
a) 50 ha      b) 100 ha      c) 200 ha      d) 400 ha
  - 4) Loss of top region of earth surface is referred as  
a) Soil reclamation      b) Soil erosion  
c) Runoff process      d) Precipitation
  - 5) The sustainable distribution of its resources and the process of creating and implementing plans, programmes and projects to sustain and enhance watershed function is termed as  
a) Soil reclamation      b) Watershed management  
c) Cooked method      d) Management



- 6) An \_\_\_\_\_ is a geological unit that can store and transmit water.  
a) Well                      b) River                      c) Sea                      d) Aquifer
- 7) The upper surface of the zone of saturation is the  
a) Water table                      b) Ground water  
c) Surface water                      d) Sub surface water
- 8) Soil erosion controlled by  
a) Rock properties                      b) Topography  
c) Vegetation and climate                      d) All the above
- 9) Land use planning should aim for  
a) An acceptable income                      b) Minimal soil loss  
c) Both a) and b)                      d) None of the above
- 10) \_\_\_\_\_ is an especially important tool for the erosion control.  
a) Vegetation                      b) Microorganisms  
c) Animals                      d) Human settlements
- 11) Watershed is geographical area where in  
a) Water stored  
b) Rainwater falling in, drains into a common point  
c) Natural water resource  
d) None of the above
- 12) The goal of integrated watershed development is  
a) Rural poverty eradication  
b) Improving the quality of rural life  
c) Improving the quality of the environment  
d) All the above
- 13) The watershed development project is operating under  
i) National Development Programme for Rural Areas (NDPRA)  
ii) National Watershed Development Programme (NWDP)  
iii) Integrated Watershed Development Programme (IWDP)  
iv) Drought Prone Area Programme (DPAP)  
v) Employment Assurance Scheme (EAS)  
a) Only i) and ii)                      b) Only ii) and iv)  
c) None of the above                      d) All of the above



- 14) National Water Policy (1987 and 2003) aim for
- a) Waste water treatment
  - b) Supply of water to industries
  - c) On meeting the drinking water needs
  - d) None of the above
2. Explain in details – Rainfall and its measurement. **14**
3. Give brief account of ground water-table with reference to depth, capillary rise, recharge etc. **14**
4. Explain watershed management plan and role of people in the management. **14**
5. Write short note on : **14**
- a) Need of water conservation.
  - b) Soil reclamation.
6. Explain in brief : **14**
- a) Runoff processing.
  - b) Terracing.
7. Discuss in short : **14**
- a) Factors affecting watershed operation.
  - b) Design of peak runoff.
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Seat No.	
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**M.Sc. – II (Semester – IV) (New – CGPA) Examination, 2016**  
**ENVIRONMENTAL SCIENCE**  
**Paper – XVI : Research Methodology**

Day and Date : Wednesday, 6-4-2016  
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Question **1** is **compulsory**.  
4) Answer **any two** questions from **2, 3, 4**.  
5) Answer **any two** questions from **5, 6, 7**.  
6) Draw **neat** and labelled diagrams **wherever** necessary.

1. Solve correct answer among the following : 14
- 1) While defining a problem, the next steps in the process after developing a title are \_\_\_\_\_
- a) Building a conceptual model and defining the study objectives
  - b) Controlling conditions and training investigators
  - c) Recording details and verifying evidence
  - d) Classifying data and analysing variables in the problem
- 2) Mention the two rights of respondents with respect to privacy.
- a) Right to participate in every research study and Right to reject being counted
  - b) Right not to participate in any research study and Right to participate beyond a certain limit
  - c) Right to view the other respondent's answers and Right to be public about it
  - d) Right to intervene with researcher and Right to mislead researcher
- 3) A conjectural statement of the relationship between the two or more variables is defined as
- a) Hypothesis
  - b) Correlation
  - c) Regression
  - d) Research design



- 4) Professor Fisher has enumerated three principles of experimental designs out of which 2 are
  - a) Principle of replication and principle of experimentation
  - b) Principle of replication and principle of randomisation
  - c) Principle of randomness and principle of locality
  - d) Principle of authority and principle of responsibility
- 5) Which of the following is not an essential element of report writing ?
  - a) Research methodology
  - b) Reference
  - c) Conclusion
  - d) None of these
- 6) Testing hypothesis is a \_\_\_\_\_
  - a) Inferential statistics
  - b) Descriptive statistics
  - c) Data preparation
  - d) Data analysis
- 7) What is the purpose of doing research ?
  - a) To identify problem
  - b) To find the solution
  - c) Both a) and b)
  - d) None of these
- 8) Which method can be applicable for collecting qualitative data ?
  - a) Artifacts (Visual)
  - b) People
  - c) Media products (Textual, Visual and sensory)
  - d) All of these
- 9) Which of the following is non-probability sampling ?
  - a) Snowball
  - b) Random
  - c) Cluster
  - d) Stratified
- 10) In group interview there are \_\_\_\_\_
  - a) One interviewer and one interviewee
  - b) More than one interviewer and one interviewee
  - c) One interviewer and more than one interviewee
  - d) More than one interviewer and more than one interviewee
- 11) Which of the following are associated with behavioral observation ?
  - a) Non-verbal analysis
  - b) Linguistic analysis
  - c) Spatial analysis
  - d) All of these



12) Uniting various qualitative methods with quantitative methods can be called as \_\_\_\_\_

- a) Coalesce
- b) Triangulation
- c) Bipartite
- d) Impassive

13) The method that consists of collection of data through observation and experimentation, formulation and testing of hypothesis is called \_\_\_\_\_

- a) Empirical method
- b) Scientific method
- c) Scientific information
- d) Practical knowledge

14) Information acquired by experience or experimentation is called as \_\_\_\_\_

- a) Empirical
- b) Scientific
- c) Facts
- d) Scientific evidences

- 2. What is empirical research ? “Empirical research in India in particular creates so many problems for the researchers.” State the problems that are usually faced by such researchers. **14**
  - 3. What is research design ? Describe some of the important research designs used in experimental hypothesis-testing research study. **14**
  - 4. What do you mean by research report ? Give an outline of a research report. What precautions should one take in drafting research report ? **14**
  - 5. Write a short note on following : **14**
    - A) Qualitative and quantitative research
    - B) Research methods versus methodology.
  - 6. Write in brief on the following : **14**
    - A) Induction and deduction
    - B) Hypothesis testing.
  - 7. Write an account on the following : **14**
    - A) Primary data collection methods
    - B) Search engines for research.
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