

Seat No.	
-------------	--

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017
Environmental Science
FUNDAMENTALS OF ENVIRONMENT

Day & Date: Thursday, 16-11-2017
 Time: 10.30 AM to 01.00 PM

Max Marks: 70

- Instructions:** 1) Attempt any five questions.
 2) All Questions carry equal marks.
 3) Question no.1 is compulsory
 4) Attempt any two questions from Q.NO.2, 3 and 4
 5) Attempt any two questions from Q.No.5, 6 and 7

Q.1 Select the answer among the following.

14

- 1) _____ is the discipline in philosophy that studies the moral relationship of human beings to, and also the value and moral status of, the environment and its non-human contents.
 - a) Environmental Science
 - b) Environmental Ethics
 - c) Interdisciplinary Science
 - d) Applied Science
- 2) _____ proposes that organisms interact with their inorganic surroundings on Earth to maintain and preserve the conditions for life on the planet.
 - a) Darwinian process
 - b) Gaia hypothesis
 - c) Leopold matrix
 - d) Gaussian Hypothesis
- 3) The process in which the developmental paths were evaluated, studied and selected to reduce down the adverse impacts on the natural environment is called _____.
 - a) Environmental Pollution
 - b) Environmental monitoring
 - c) Sustainable Environment
 - d) Environmental decision making
- 4) Stratospheric ozone filters _____ allowing only a small amount to reach the Earth's surface.
 - a) Air pollutants coming from the mesosphere
 - b) Acid rain
 - c) Harmful UV radiation
 - d) Particulate matter in the upper atmosphere
- 5) The uppermost part of the lithosphere that chemically reacts to the atmosphere, hydrosphere and biosphere through the soil forming process is called the _____.
 - a) Mesosphere
 - b) Pedosphere
 - c) Asthenosphere
 - d) Atmosphere
- 6) Biodiversity Hotspot are characterized on the basis of:
 - a) Endemic flowering plant and threat perception
 - b) Endemic flowering plant
 - c) Species of flowering plants
 - d) None of above
- 7) Which gas exists in the highest concentration in the Earth's atmosphere?
 - a) CO₂
 - b) O₂
 - c) N₂
 - d) O₃

- 8) Which of following statement is incorrect about the Biosphere?
 - a) Biosphere is combination of lithosphere, hydrosphere and atmosphere
 - b) Biosphere is missing at extreme of north and south pole
 - c) Organisms are uniformly present in Biosphere
 - d) All of the above
- 9) What is the meaning of the core bleaching?
 - a) Paling of coral color or decline in zooxanthellae (microscopic algae) due to climate change
 - b) Impacts of excessive sea trade on fishing industry
 - c) Both a and b
 - d) None of the above
- 10) In a population, unrestricted reproductive capacity is called as
 - a) Carrying capacity
 - b) Biotic potential
 - c) Birth rate
 - d) Fertility rate
- 11) The pyramid of energy in terrestrial ecosystem is
 - a) Upright
 - b) Inverted
 - c) Spindle shaped
 - d) Irregular
- 12) The process of successful establishment of the species in a new area is called _____.
 - a) Sere
 - b) Climax
 - c) Invasion
 - d) Ecesis
- 13) Which one is true?
 - a) Symbiosis is when neither population affects each other
 - b) Symbiosis is when the interaction is useful for both the populations
 - c) Commensalism is when none of the interaction population affect each other
 - d) Commensalism is when the interactions is useful to both populations
- 14) The effect of inters specific completion on niches is to make them
 - a) Larger
 - b) Smaller
 - c) More triangular
 - d) Change location

- Q.2** Discuss why environmental science is called multidisciplinary science? Explain the need of natural resource conservation with suitable example? **14**
- Q.3** What is Soil Erosion? Discuss the environmental factors affecting soil erosion? Explain its causes and adverse effects on environment? **14**
- Q.4** What is atmosphere? Explain its composition in detail? How CO₂ is responsible for the increase in troposphere temperature near the earth? **14**
- Q.5** **Write a short note on the following:** **14**
A) Nitrogen Cycle
B) Population Ecology
- Q.6** **Write a brief with suitable illustration on the following:** **14**
A) Bioaccumulation and Bio magnification
B) Food Chain and Food Web
- Q.7** **Write an account on the following:** **14**
A) Structure and composition of Lithosphere
B) Gaia Hypothesis

Seat No.	
----------	--

Set **P**

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017
Environmental Science
ENVIRONMENTAL CHEMISTRY

Day & Date: Saturday, 18-11-2017
 Time: 10.30 AM to 01.00 PM

Max Marks: 70

- Instructions:** 1) Attempt any five questions.
 2) All Questions carry equal marks.
 3) Question no.1 is compulsory
 4) Attempt any two questions from Q.No.2, 3 and 4
 5) Attempt any two short note questions from Q.No.5, 6 and 7

Q.1 Select the answer among the following**14**

- 1) Which of the following process Contributes to CO₂ into the atmosphere
 - a) Combustion
 - b) Fermentation
 - c) Putrefaction
 - d) Fog
 - e) All
- 2) Which of the following species result from photo insertion
 - a) O₂⁺
 - b) b⁺
 - c) NO⁺
 - d) All
- 3) Which of the following pollutants could be transported over long distances
 - a) PAHs
 - b) PCBs
 - c) DDT
 - d) All
- 4) Pesticides have been found to affect
 - a) Central nervous system
 - b) Respiratory system
 - c) Digestive System
 - d) All
- 5) Nitric oxide is generated into the atmosphere by
 - a) Forest fires
 - b) Industrial heating
 - c) Domestic heating
 - d) Internal combustion engines
 - e) All
- 6) Liquids in gas aerosol are
 - a) Clouds
 - b) Fog
 - c) Mist
 - d) Smog
 - e) All
- 7) Aerosols may be in the form of
 - a) Smoke
 - b) Dust
 - c) Mist
 - d) All
- 8) The diesel vehicles pollute the environment largely thought
 - a) NO_x
 - b) Particulates
 - c) CO
 - d) Un burnt Hydrocarbons
 - e) All

- 9) The boifuel fraction in diesel is
 - a) Biodegradable
 - b) Non-toxi
 - c) Oxygen rich for efficient combustion
 - d) All
- 10) Exposure to mercury can cause
 - a) Neurotoxicity
 - b) Speech and visual impairment
 - c) Kidney failure
 - d) Alzheimer's diseases
 - e) All
- 11) Inorganic tin may undergo alkyltion in aquatic environment to from
 - a) Monomethyl Tin
 - b) Dimethyl tin
 - c) Both
 - d) None
- 12) Humic material in water may be found
 - a) In free form
 - b) Complexes with metal ion
 - c) Complexed wit organic Species
 - d) All
- 13) Odour in water can be eliminated from water by -
 - a) Activated carbon
 - b) Chlorination
 - c) Aeration
 - d) Ozone
- 14) Liquids in gas aerosol are
 - a) Clouds
 - b) Fog
 - c) Mist
 - d) Smog
 - e) All

- Q.2** Explain in brief the principles and importance and types of filtration techniques in water treatments. **14**
- Q.3 Explain the terms- 14**
- 1) Chemical Equilibrium
 - 2) Redox Potential
 - 3) Acid – base reaction
 - 4) Soil air
- Q.4** Explain the importance of DO, BOD and COD in water and waste water treatments. **14**
- Q.5 Write a short note on the following 14**
- a) Sedimentation
 - b) Soil Fertility
- Q.6 Write In Brief: 14**
- a) Gibbs energy
 - b) Pheromones
- Q.7 Write importance and significance of: 14**
- a) Integrated pest management
 - b) Water sampling techniques

Seat No.	
---------------------	--

Set **P**

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017
Environmental Science
COMPUTER APPLICATIONS

Day & Date: Tuesday, 21-11-2017
 Time: 10.30 AM to 01.00 PM

Marks: 70

- Instruction:** 1) Attempt any five questions.
 2) All Questions carry equal marks.
 3) Question no.1 is compulsory
 4) Attempt any two essay questions from Q.NO.2, 3 and 4.
 5) Attempt any two short note questions from Q.No.5, 6 and 7.
 6) Draw neat and labeled diagrams wherever necessary.

Q.1 Choose the correct answer:**14**

- 1) Which of the following is not a form of data?
 - a) Numbers
 - b) Pictures
 - c) Sound
 - d) None of the above
- 2) Among the following is brain of any computer system
 - a) Central Processing Unit
 - b) Memory Processing Unit
 - c) Final Processing Unit
 - d) Control Central Unit
- 3) What is the full form of CRT?
 - a) Current ray tube
 - b) Current ray Technology
 - c) Cathode ray tube
 - d) Cathode ray Technology
- 4) CD – ROM stands for
 - a) Compact Device Read Only Memory
 - b) Compact Data Read Only Memory
 - c) Compactable Disk Read Only Memory
 - d) Compact Disk Read Only Memory
- 5) Which of the items below are considered removable storage media?
 - a) Removable hard disk cartridges
 - b) Magnetic disk
 - c) Flexible disks cartridges
 - d) All of the above
- 6) VIRUS stands for _____
 - a) Virtual Information Resource Under Search
 - b) Virtual Information Resource Under Seize
 - c) Verify Information Result Until Source
 - d) Very Important Record User Searched
- 7) ASCII stands for
 - a) American Standard Code for Information Interchange
 - b) American Standard Code for International Interchange
 - c) American Standard Code for Intelligence Interchange
 - d) American Scientific Code for Information Interchange

- 8) The full form EEPROM is
 - a) Electrically Erasable Programmable Read only Memory
 - b) Easily Erasable Programmable Read only Memory
 - c) Electronic Erasable Programmable Read only Memory
 - d) All of the above
- 9) Which one of the following is important software in GIS
 - a) ARC Sensor
 - b) ARC GIS
 - c) ARC EVS
 - d) ARC Network
- 10) Environmental modeling do not undertake one of the following area
 - a) Parameterisation of 3D geological models
 - b) Development of numerical process techniques for groundwater
 - c) Environmental restoration through pollution control
 - d) Geostatistics and model development and data integration
- 11) Database Management System
 - a) Collection of interrelated data
 - b) Collection of Programs to access data
 - c) Collection of data describing one particular enterprise
 - d) All of the above
- 12) Bioinformatics is an interdisciplinary field that develops
 - a) Methods and software tools for biological data
 - b) Understand software tools for biological data
 - c) Connects software tools for GIS
 - d) Technology tools for organisms
- 13) Among the following is not the area of web design
 - a) Interface Design
 - b) Proprietary Software
 - c) Search Engine Optimization
 - d) ISO Practices and Method
- 14) Which models use an empirical method to convert rainfall volume into runoff volume
 - a) Hydrological Models
 - b) Rainwater Models
 - c) Groundwater Models
 - d) Agronomic Models

- Q.2** Explain the characteristics of computer. Also describe various input and output devices of computer. **14**
- Q.3** What is an operating system? Write an account on various Components of it. **14**
- Q.4** What are various modes of data communication and networks? Also add a note on importance of it in environmental science. **14**
- Q.5** **Write a short note on the following:** **14**
- a) Importance of information Technology.
 - b) Software Used in Environmental Sciences.
- Q.6** **Write in brief on the following:** **14**
- a) What is DBMS and what are components of DBMS?
 - b) Discuss the importance of computer aided programmes in Geoinformatics.
- Q.7** **Write in brief on the following:** **14**
- a) Add a note on history of computer.
 - b) Discuss the importance of computer graphics

Seat No.	
----------	--

Set **P**

M.Sc. (Semester - II) (New) (CBCS) Examination Oct/Nov-2017
Environmental Science
BIODIVERSITY AND CONSERVATION

Day & Date: Friday, 17-11-2017
 Time: 10.30 AM to 01.00 PM

Max. Marks: 70

- Instructions:** 1) Answer any Five Question.
 2) All Questions carry equal marks.
 3) Question No. 1 is Compulsory.
 4) Attempt any two from Q.No.2, 3 and 4.
 5) Attempt any two from Q.No.5, 6 and 7.

Q.1 A) Select the answer among the following:**14**

- 1) Which one is odd for species diversity?
 - a) α diversity
 - b) γ diversity
 - c) β diversity
 - d) λ diversity
- 2) How many biosphere reserves are present in India?
 - a) 41
 - b) 34
 - c) 14
 - d) 43
- 3) Which microorganism is responsible for synthesis of antibiotics?
 - a) Bacteria
 - b) Virus
 - c) Fungus
 - d) Algae
- 4) In which region of South America maximum species of birds can be found?
 - a) Equador
 - b) Brazil
 - c) Colombia
 - d) Peru
- 5) Which scientist has classified species diversity?
 - a) Thoeprustus
 - b) Lineus
 - c) Whittaker
 - d) Treshaw
- 6) Which group is meant for Endemic species of birds?
 - a) Nilgiri pipit, Rofous babbler, Lesser-Florican
 - b) Lesser-Florican, Nilgiri wood pigeon, Malabar parakeet
 - c) Malabar parakeet, Nilgiri pipit, Rofous babbler
 - d) All the above
- 7) Which is the correct option.
 - a) There is chance in Natural selection in evolution process due to alpha biodiversity
 - b) There is chance in Natural selection in process of evolution due to genetic diversity
 - c) There is chance in Natural selection in process of evolution due to Ecosystem biodiversity
 - d) Here is chance in Natural selection in process of due to bio community diversity

- 8) How many protected areas are present in India?
 - a) 89
 - b) 581
 - c) 492
 - d) 34
- 9) What can be done by the number of species in habitat?
 - a) Measurement of species diversity in habitat
 - b) Measurement of gene diversity of species in habitat
 - c) Measurement of interaction of bio-communities
 - d) Measurement of function of Ecosystem
- 10) Which is the right sequence for Ecological diversity?
 - a) Biomes → habitat → Ecosystem → population
 - b) Biomes → Ecosystem → habitat → niches
 - c) Biomes → Ecosystem → population → niches
 - d) Biomes → habitat → niches → Ecosystem
- 11) Where the knowledge of biodiversity is applicable?
 - a) To study, classification of animals and plants.
 - b) To study, Ecosystem
 - c) To study, Bio-geological region
 - d) All the given
- 12) Which statement is correct for buffer zone of biosphere reserve?
 - a) It is legally protected
 - b) Authority takes cooperation with local people.
 - c) Environmental Education is facilitated by the zone
 - d) Hunting and felling of trees occur in this zone
- 13) Biodiversity of which organism is more in Eastern Ghat in comparison to Western Ghat?
 - a) Reptilia
 - b) Amphibian
 - c) Aves
 - d) Mammals
- 14) What is Ecosystem diversity?
 - a) Similarity of Species diversity in Ecosystem
 - b) Variation in Species diversity in Ecosystem
 - c) Mutation in Species diversity in Ecosystem
 - d) Homozygosity in Species diversity in Ecosystem

- | | | |
|------------|---|-----------|
| Q.2 | List the biogeographical regions in India? Explain each region properly with characteristic significance? | 14 |
| Q.3 | Explain the concept of 'Biodiversity Hotspot'? Discuss the importance of Western Ghats with respect to its faunal species characteristics? | 14 |
| Q.4 | Explain the strategies of biodiversity conservation? Discuss <i>In-situ</i> and <i>Ex-situ</i> Conservation methods for the protected area? | 14 |
| Q.5 | Write a short note on the following
a) Chipko Movement
b) Role of IUCN in world biodiversity conservation | 14 |
| Q.6 | Write a brief with suitable illustration on the following
a) Community diversity
b) Biosphere reserves | 14 |
| Q.7 | Write an account on the following.
a) Bio-piracy
b) Ramsar Convention | 14 |

Seat No.	
----------	--

Set **P**

M.Sc. (Semester - II) (New) (CBCS) Examination Oct/Nov-2017
Environmental Science
WATER AND WASTEWATER ENGINEERING

Day & Date: Monday, 20-11-2017
 Time: 10.30 AM to 01.00 PM

Max. Marks: 70

- Instructions:** 1) Answer any Five Question.
 2) All Questions carry equal marks.
 3) Question No. 1 is Compulsory.
 4) Attempt any two from Q.No.2, 3 and 4.
 5) Attempt any two from Q.No.5, 6 and 7.

Q.1 Select the answer among the following**14**

- 1) The pH value of fresh sewage is usually
 - a) Equal to 7
 - b) Less than 7
 - c) More than 7
 - d) Equal to zero
- 2) The maximum depth of sedimentation tanks, is kept
 - a) 3 m
 - b) 4 m
 - c) 3.5 m
 - d) 4.5
- 3) If the depletion of oxygen is found to be 5 ppm after incubating a 2.5% solution of sewage sample for 5 days at 21°C, B.O.D. of the sewage is
 - a) 50 ppm
 - b) 150 ppm
 - c) 100 ppm
 - d) 200 ppm
- 4) For a continuous flow type of sedimentation tanks
 - a) Width of the tank is normally kept about 6 m
 - b) Length of the tank is normally kept 4 to 5 times the width
 - c) Maximum horizontal flow velocity is limited to 0.3 m/minute
 - d) All the above
- 5) No treatment of the sewage is given if dilution factor is
 - a) Less than 150
 - b) Between 200 to 300
 - c) Between 150 to 200
 - d) More than 500
- 6) For the COD test of sewage, organic matter is oxidized by K₂Cr₂O₇ in the presence of
 - a) H₂SO₄
 - b) HCl
 - c) HNO₃
 - d) None of these
- 7) Pick up the correct statement from the following:
 - a) Hydrogen sulphide gas in excess, may cause corrosion of concrete sewers
 - b) 4 ppm of Dissolved Oxygen (D.O.) is ensured before discharging the treated sewage in river
 - c) Solubility of oxygen in sewage is 95% of that of distilled water
 - d) All the above
- 8) Skimming tanks are
 - a) Used to remove the grease and oil
 - b) Those from which sludge is skimmed out
 - c) Tanks provided with self-cleansing screens
 - d) Improved version of grit chambers

Seat No.	
----------	--

Set **P**

M.Sc. (Semester - II) (New) (CBCS) Examination Oct/Nov-2017
Environmental Science
REMOTE SENSING AND GIS IN ENVIRONMENTAL SCIENCE

Day & Date: Wednesday, 22-11-2017
 Time: 10.30 AM to 01.00 PM

Max. Marks: 70

- Instructions:** 1) Answer any Five Question.
 2) All Questions carry equal marks.
 3) Question No. 1 is Compulsory.
 4) Attempt any two from Q.No.2, 3 and 4.
 5) Attempt any two from Q.No.5, 6 and 7.

Q.1 Select the answer among the following**14**

- 1) Which one of the following statement is correct?
 - a) Snow albedo falls at all wave length with increase of grain size
 - b) The effect of grain size on reflection is maximum in the near IR region
 - c) The effect of grain size on reflection is low in the visible region of the spectrum
 - d) All of these
- 2) Electromagnetic radiation
 - a) Produces a time varying magnetic field and vice versa
 - b) Once generated, remains self propagating
 - c) Is capable to travel across space
 - d) All of these
- 3) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface are called.

a) Sensors	b) Passive Sensors
c) Active Sensors	d) None of these
- 4) 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
- 5) The part of radiation due to scattered/diffused entering the field of view of a remote sensor.
 - a) Reduces the contrast of the image and also its sharpness
 - b) Increases the contrast of image but reduces the sharpness
 - c) Increases both the contrast and sharpness
 - d) Reduces the contrast but increases the sharpness
- 6) The arrangement of terrain features which provides attributes: the shape, size and texture of objects is called.

a) Spatial variation	b) Spectral variation
c) None of these	d) Temporal variation

- 7) The reflectance from a surface is called secular reflection if it follows.
 - a) Snell's law
 - b) Plankton's law
 - c) Lambert's cosine law
 - d) All of these
- 8) For interpretation of satellite data used for monitoring dynamic changes that occur on the earth surface the most suitable orbit for the satellite is.
 - a) Near polar orbit
 - b) Sun-synchronous orbit
 - a) Circular orbit
 - b) None of these
- 9) GIS deals with which kind of data
 - a) Numeric data
 - b) Binary data
 - c) Spatial data
 - d) Complex data
- 10) Which of the following is related to GIS
 - a) Euclidean space
 - b) Pythagorean space
 - c) Ramanujan space
 - d) None of these
- 11) Which of the following belong to the eight spatial relationships?
 - a) Disjoint, meets, equals
 - b) Contains, covers, Overlaps
 - c) Inside, covered by
 - d) All of these
- 12) Which of the following relationship is correct
 - a) Point (0-simplex)
 - b) Triangle (2-simplex)
 - c) Line segment (1-simplex)
 - d) All of these
- 13) The 'boundary model' is sometimes also called
 - a) Topological data model
 - b) Topological discrete model
 - c) Temporal data model
 - d) Temporal discrete model
- 14) What is metadata?
 - a) It is 'data about data'
 - b) It is 'Oceanic' data
 - c) It is 'metrological' data
 - d) It is 'Contour' data

- | | | |
|------------|--|-----------|
| Q.2 | Define resolution. What are its types? Throw light on its importance in remote sensing. | 14 |
| Q.3 | Describe various types of Sensors and platforms and discuss their salient features. | 14 |
| Q.4 | Explain the difference between raster and vector data structure. Mention their merits and limitations also. | 14 |
| Q.5 | Write a short notes on the following:
a) Advantages of Topology
b) Concept of Arc, Node and Vertices | 14 |
| Q.6 | Write a brief with suitable illustration on the following:
a) Explain the Historical Development of Remote sensing Technique in India.
b) Elaborate the elements of Image interpretation. | 14 |
| Q.7 | Write an account on the following
a) Spatial data query
b) Interval and Ratio data | 14 |

- 9) Which soil has the highest water holding capacity?
 - a) Sandy Soil
 - b) Clayey Soil
 - c) Loamy Soil
 - d) Mixture of Sands and Loam
- 10) The minimum allowable concentration of TDS in drinking water is _____.
 - a) 600 ppm
 - b) 500 ppm
 - c) 250 ppm
 - d) 1000 ppm
- 11) Partially biodegradable plastic contains _____.
 - a) Polyethylene and rubber
 - b) Corn starch and Plastics
 - c) Cellulose and plastics
 - d) Polystyrene with saw dust
- 12) Which of the following treatments are used in Composting and lagooning?
 - a) Filtration
 - b) Sewage disposal
 - c) Sedimentation
 - d) Sludge digestion
- 13) Find out the group of plants which is most resistant to ionizing radiations.
 - a) Coniferous forest
 - b) Lichens and Mosses
 - c) Grasslands
 - d) Mixed forest
- 14) The sustainable way to the disposal of biomedical waste is _____.
 - a) Incineration
 - b) Land filling
 - c) Autoclaving
 - d) Both (b) and (c)

- | | | |
|------------|---|-----------|
| Q.2 | What is Air pollution? Elaborate the sources and effects in brief. | 14 |
| Q.3 | Define Water pollution; explain the Water pollution monitoring procedures in detail. | 14 |
| Q.4 | Write in detail account on Types of soil pollution and discuss few remedial techniques. | 14 |
| Q.5 | Write a short notes on following: | 14 |
| | a) Noise Exposure. | |
| | b) Drinking water quality standards. | |
| Q.6 | Write in with suitable illustration of the following: | 14 |
| | a) Soil reclamation. | |
| | b) Biomedical waste toxicity. | |
| Q.7 | Write an account on the following: | 14 |
| | a) Radiation exposure and health hazards. | |
| | b) Oil spill: Effects and control measures. | |

Seat No.	
----------	--

M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017
Environmental Science
ENVIRONMENTAL BIOTECHNOLOGY

Day & Date: Saturday, 18-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Answer any Five Question.
 2) All Questions carry equal marks.
 3) Question No. 1 is Compulsory.
 4) Attempt any two questions from Q.No.2,3,and 4.
 5) Attempt any two short note questions from Q.No.5,6 and 7.
 6) Draw neat and labeled diagrams wherever necessary.

Q.1 Fill in the blanks.

14

- 1) Methamoglobinemia is caused by the drinking water contamination with _____.

a) Phosphate	b) Mercury
c) Cadmium	d) Nitrate
- 2) In relation to the bacterium's optimal growth requirements, which group would you expect to be MOST likely involved in decomposition of compost piles?

a) Acidophilic	b) Psychrophilic
c) Halophilic	d) Thermophilic
- 3) The concept of putting microbes to help clean up the environment is called _____.

a) Pasterurisation	b) Bioremediation
c) Fermentation	d) Biolistics
- 4) Which of the following does not employ bacteria?

a) Oxidation pond	b) Trickling filter
c) Contact aerators	d) Rotating Biological Contractors
- 5) Activated Sludge Treatment Process involves microbes in the growth phase of _____.

a) Stationary phase	b) Log phase
c) Lag phase	d) Death phase
- 6) The filtering medium of trickling filters is located with microbial flora, known as _____.

a) Zoological film	b) Geological film
c) Zoological film	d) None of these
- 7) Which of the following is generally not referred to the sewerage system?

a) Sanitary sewers	b) Storm sewers
c) Combined sewers	d) Solid sewers

Seat No.	
----------	--

Set **P**

M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017
Environmental Science
ENVIRONMENTAL STATISTICS

Day & Date: Tuesday, 21-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Answer any Five Question.
 2) All Questions carry equal marks.
 3) Question No. 1 is Compulsory.
 4) Attempt any two questions from Q.No.2, 3 and 4.
 5) Attempt any two questions from Q.No.5, 6 and 7.
 6) Draw neat and labeled diagrams wherever necessary.
 7) Scientific calculator is allowed for calculations.

Q.1 Select the answer among the following**14**

- 1) In a frequency distribution, the mid-value of a class is 60.5 and the width of the class is 10. The lower limit of the class is

a) 55.5	b) 65.5
c) 62.5	d) 56.5
- 2) The median of the data: 19,25,59,48,35,31,30, 32, 51. If 25 is replaced by 52, what will be the new median.

a) 35	b) 53
c) 43	d) 45
- 3) The degree of peakedness is called_____.

a) Kurtosis	b) Skewness
c) Symmetry	d) Dispersion
- 4) By which other name is the chi-square goodness of fit test known?

a) Two sample chi-square	b) Wilcoxon
c) One sample chi-square	d) Directional chi-square
- 5) What is the expected number of heads appearing when a fair coin is tossed three times?

a) 2.1	b) 1.5
c) 3.2	d) 4.1
- 6) Any hypothesis which is tested for the purpose of rejection under the assumption that it is true is called:

a) Null hypothesis	b) Alternative hypothesis
c) Statistical hypothesis	d) Composite hypothesis
- 7) Which method of analysis does not classify variables as dependent or independent?

a) Regression analysis	b) Discriminant analysis
c) Analysis of variance	d) Cluster analysis

- 8) A coefficient of correlation is computed to be -0.95 means that _____.
 - a) The relationship between two variables is weak.
 - b) The relationship between two variables is strong and positive
 - c) The relationship between two variables is strong and but negative
 - d) Correlation coefficient cannot have this value
- 9) In case of open-ended classes, an appropriate measure of dispersion to be used is _____.
 - a) Range
 - b) Quartile Deviation
 - c) Mean Deviation
 - d) Standard Deviation
- 10) The correlation between two variables is called as _____.
 - a) Multiple correlation
 - b) Partial correlation
 - c) Simple correlation
 - d) Total correlation
- 11) Student's t-statistic is applicable in case of :
 - a) Equal number of samples
 - b) Unequal number of samples
 - c) Small samples
 - d) All of the above
- 12) The specific statistical methods that can be used to summarize or to describe a collection of data is called:
 - a) Descriptive statistics
 - b) Inferential statistics
 - c) Analytical statistics
 - d) All of the above
- 13) The correlation between two variables is called as _____.
 - a) Multiple correlation
 - b) Partial correlation
 - c) Simple correlation
 - d) Total correlation
- 14) The most important part of _____ is selecting the variables on which clustering is based.
 - a) Interpreting and profiling clusters
 - b) Selecting a clustering procedure
 - c) Assessing the validity of clustering
 - d) Formulating the clustering problem

Q.2 Answer the following.

- a) Differentiable between median and mode? Discuss their merits and demerits. 14
- b) Calculate the geometric mean of the following data.

Number of Seeds per plant	80-90	90-100	100-110	110-120	120-130	130-140
Number of plants	12	22	37	27	26	10

Q.3 Answer the following

- a) Calculate mean, variance and standard deviation from the following data recorded on the number of Clusters in variety of Black gram.
Number of Clusters: 8, 10, 10, 10, 12, 13, 15, 15, 17, 20. 14
- b) What are characteristics of Chi-Square test?
The ratio of the male and the female births is expected to be 1:1. It was founded in one village that the male children born were 52 and the females were 48. Calculate the χ^2 and interpret your test.

Q.4 Answer the following.

- a) What is correlation? Discuss various methods of studying correlation. 14
- b) Discuss the concept of probability with addition and multiplication rule.

- Q.5 Write a short notes on following:** **14**
- a) Methods of Sampling.
 - b) Cumulative Frequency Curve.
- Q.6 Write in brief on the following.** **14**
- a) What is cluster analysis? Add a note on different types of clusters.
 - b) Discuss type I and type II error in testing of hypothesis?
- Q.7 Write an account on the following** **14**
- a) What is principle component analysis? Discuss its importance in environmental studies.
 - b) What are basic principles of experimental design?

Seat No.	
----------	--

Set **P**

M.Sc. (Semester - III) (Old) (CBCS) Examination Oct/Nov-2017
Environmental Science
ENVIRONMENTAL POLLUTION

Day & Date: Thursday, 16-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Answer any Five Question.
 2) All Questions carry equal marks.
 3) Question No. 1 is Compulsory.
 4) Attempt any two from Q.No.2, 3 and 4.
 5) Attempt any two from Q.No.5, 6 and 7.
 6) Draw neat labeled diagrams wherever necessary.

Q.1 Select the answer among the following.**14**

- 1) Decreasing Fish population from water bodies indicates excess of _____
 Pollutant in water.
 - a) Zn
 - b) Hg
 - c) Fluoride
 - d) P
- 2) Most important soil pollutant is:
 - a) Plastic
 - b) Detergents
 - c) Both A & B
 - d) Glass Junk
- 3) Soil are impoverished over extensive cultivated areas mainly because:
 - a) Droughts and floods affect cultivation
 - b) Cultivation has been practiced for more than 4000 years
 - c) Fertilizers are not extensively used
 - d) Soil erosion has removed top soil
- 4) _____ not cause any atmospheric pollution?
 - a) Hydrogen
 - b) Carbon dioxide
 - c) Sulphur dioxide
 - d) Any of these
- 5) _____ is ozone destroying constituent -
 - a) Chlorofluorocarbons
 - b) CH₄
 - c) SO₂
 - d) NO₂
- 6) UV radiation is necessary for
 - a) Promoting the synthesis of vitamin D in human
 - b) Promoting CFC_s production
 - c) Both A and B
 - d) None of the above
- 7) The capacity of the organic and biological matter in a sample of natural water to consume oxygen and this process catalyzed by bacteria is called-
 - a) Chemical oxygen demand (COD)
 - b) Biological oxygen demand (BOD)
 - c) Bivariate oxygen demand (BOD)
 - d) Complete oxygen demand (COD)

- 8) Water cycle is combination of
 a) Ground water atmospheric cycles
 b) Surface water and atmospheric cycles
 c) Global and local cycles
 d) Oceanic and fresh water cycles
- 9) Water cycle involves _____.
 a) Forest trees
 b) Microorganism
 c) Algae
 d) Evaporation of water from water bodies
- 10) Weathering lead to formation of -
 a) Sedimentary soil
 b) Immature soil
 c) Secondary Soil
 d) All of these
- 11) The major organic compound of soil is -
 a) Humus
 b) Sludge
 c) Subsoil
 d) Matrix
- 12) "Earth provides enough to satisfy every man's need, but not every man's greed." was said by
 a) Mahatma Gandhi
 b) E. P. Odum
 c) Rachel Carson
 d) Sundarlal Bahuguna
- 13) SO₂, CO are -
 a) Primary pollutant
 b) Secondary pollutant
 c) Both of these
 d) None of these
- 14) The major source of harmful radiations in the house _____.
 a) Tube light
 b) Colour TV
 c) Oven
 d) Heater

- Q.2** Write brief account of effects of Noise pollution and control of Noise at source? **14**
- Q.3** What is thermal pollution? Explain its effects on Environment? **14**
- Q.4** Discuss mining and soil pollution? **14**
- Q.5** **Discuss in short:** **14**
 a) Natural and manmade pollution of radiation pollution.
 b) Photochemical smog.
- Q.6** **Write short note on:** **14**
 a) Measurement of noise.
 b) Consequences of water pollution.
- Q.7** **Explain in brief:** **14**
 a) Types of radiation pollution.
 b) Sources of solid waste.

Seat No.	
----------	--

M.Sc. (Semester - III) (Old) (CBCS) Examination Oct/Nov-2017
Environmental Science
ENVIRONMENTAL BIOTECHNOLOGY

Day & Date: Saturday, 18-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Answer any Five Question.
 2) All Questions carry equal marks.
 3) Question No. 1 is Compulsory.
 4) Attempt any two from Q.No.2, 3 and 4.
 5) Attempt any two from Q.No.5, 6 and 7.
 6) Draw neat and labeled diagrams wherever necessary.

Q.1 Select the answer among the following

14

- 1) "Biomagnification" is _____.
 a) Increase in the biotic population of an area
 b) Increase in the size of the individuals of a species due to natural evolution
 c) Process where by harmful chemicals enter and get concentrated in a food chain
 d) None of the above
- 2) Lichen is an example of _____.
 a) Amensalism
 b) Commensalism
 c) Symbiosis
 d) Parasitism
- 3) Immobilization technology can be used
 a) Treatment of effluents
 b) Control of pests
 c) Control of bacteria
 d) Control of diseases
- 4) Nif gene is useful in _____.
 a) Photosynthesis
 b) Reproduction
 c) Circulation
 d) Nitrogen fixation
- 5) The viruses which infect bacteria are _____.
 a) Cyanophages
 b) Mycophages
 c) Bacteriophages
 d) None of the above
- 6) The widely used staining schedule for colouring bacterial cells is _____.
 a) Gram staining
 b) Eosin staining
 c) Methylene blue staining
 d) None of the above
- 7) Metal recovery by microbes involves _____.
 a) Bioremediation
 b) Biotransformation
 c) Bioleaching
 d) Fermentation
- 8) A compound that is foreign in nature to biological system is _____.
 a) Halogenated compound
 b) Aromatic compound
 c) Xenobiotic compound
 d) None of the above

9) Biologically catalyzed reduction in the complexity of chemical compound is _____.

- a) Biosynthesis
- b) Bio-degradation
- c) Photosynthesis
- d) Respiration

10) In vermin-composting _____ are used to produce compost

- a) Algae
- b) Fungi
- c) Bacteria
- d) Worms

11) The enzymes that produce internal cuts in DNA molecule are _____.

- a) Lipases
- b) Amylases
- c) Peptidases
- d) Endonucleases

12) DNA copy of an RNA molecule is produced by enzyme _____.

- a) Ligase
- b) Reverse transcriptase
- c) Endonuclease
- d) Lipase

13) Freshly isolated animal cell cultures are _____.

- a) Primary cultures
- b) Secondary cultures
- c) Cell lines
- d) None of the above

14) Most commonly used enzyme for enzymatic disaggregation of cell cultures is _____.

- a) Trypsin
- b) Endonuclease
- c) Ligase
- d) Reverse transcriptase

- Q.2** Give a short account of Genetically modified organisms, highlighting their applications. **14**
- Q.3** Explain the significance of Biopesticides. Also, give an example of microbial biopesticides useful in agricultural field. **14**
- Q.4** Explain in detail about use of phytoremediation technology for soil decontamination. **14**
- Q.5** **Write note on:** **14**
- a) Bioremediation
 - b) Carbon sequestration
- Q.6** **Explain in brief:** **14**
- a) Scope of environmental biotechnology
 - b) Degradation of pesticides
- Q.7** **Write an account on:** **14**
- a) Biological filtration process in air environment.
 - b) Role of microorganisms in wastewater treatment.

- 9) GIS stand for _____.
- General Information Service
 - Geographical information system
 - Geographical intensive system
 - Geographical intensive scheme
- 10) The Wildlife (Protection) Act was enacted in the year:
- 1986
 - 1974
 - 1994
 - 1972
- 11) The functions of Central Board are given under:
- Section 16
 - Section 19
 - Section 25
 - Section 24
- 12) NGOs stands for:
- Non-Governmental Organization
 - Nine-Governmental Organization
 - Non-Gained Organization
 - National-Grade Organization
- 13) Literate women can help in:
- Reducing infant mortality rate
 - Reducing population growth
 - Promoting female children education
 - All of the above
- 14) Ministry of Environment and forest was established in _____.
- 1980
 - 1986
 - 1972
 - 1988

- Q.2** Water (prevention and control of Pollution) Act, 1974. **14**
- Q.3** Name some of the environmental Conferences? Explain the principles of Stockholm conference. **14**
- Q.4** Write in brief the international and national environmental policies of India. **14**
- Q.5** **Write short notes on:** **14**
- Montreal Protocol
 - Define EMS and it's explain its scope
- Q.6** **Give a brief account of:** **14**
- Environmental
 - IUCN
- Q.7** **Write short notes on:** **14**
- The factory act, 1948
 - Biodiversity status and legality in India

- 10) Which pollutant among the following is the most destructive to nervous systems?
- a) SO₂
 - b) Lead
 - c) CO
 - d) None of these
- 11) The branch of toxicology which examines the effect of chemicals on immune system is _____.
- a) Immune toxicology
 - b) Molecular toxicology
 - c) Ecotoxicology
 - d) None of these
- 12) The progressive increase in concentration of xenobiotic compound, when it passes through the food chain is called as:
- a) Bio magnification
 - b) Bioaccumulation
 - c) Hyper accumulation
 - d) None of the above
- 13) The substances which affect foetal development are called as:
- a) Carcinogens
 - b) Teratogens
 - c) Mutagens
 - d) Sarcinogens
- 14) Formation of car boxy hemoglobin is a process involving reaction of:
- a) Lead with hemoglobin
 - b) Arsenic with hemoglobin
 - c) Nitrogen with hemoglobin
 - d) Carbon monoxide with hemoglobin

- Q.2** Define toxicant. Give the list of toxic chemicals in the environment. Indicate their sources and toxic actions? **14**
- Q.3** Discuss the toxic responses of the respiratory system with suitable example? **14**
- Q.4** What are personal protective equipments? Give its types and advantages? **14**
- Q.5** **Write a short note on following:** **14**
- a) Bioassay
 - b) Animal toxins and Phytotoxins
- Q.6** **Write in brief on the following:** **14**
- a) Effects of toxicants on ecosystems.
 - b) Detoxification of toxicant.
- Q.7** **Write an account on the following:** **14**
- a) TLC
 - b) Need of occupational safety

Seat No.	
----------	--

M.Sc. (Semester - IV) (New) (CBCS) Examination Oct/Nov-2017
Environmental Science
RESEARCH METHODOLOGY

Day & Date: Wednesday, 22-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Answer any Five Question.
 2) All Questions carry equal marks.
 3) Question No. 1 is Compulsory.
 4) Attempt any two from Q.No.2, 3 and 4.
 5) Attempt any two from Q.No.5, 6 and 7.
 6) Draw neat and labeled diagrams wherever necessary.

Q.1 Select the answer among the following

14

- 1) Research is based upon -
 - a) Scientific method
 - b) Scientist
 - c) Experiments
 - d) General Person
- 2) Research should be -
 - a) Objective
 - b) Reliable
 - c) Valid
 - d) All the above
- 3) A conjectural statement of the relationship between the two more variables is defined as -
 - a) Hypothesis
 - b) Regression
 - c) Correlation
 - d) Research design
- 4) The survey research are classified under the -
 - a) Fundamental researches
 - b) Experimental researches
 - c) Both of the above
 - d) None of the above
- 5) Which of the following is not an essential element of report writing?
 - a) Research Methodology
 - b) Conclusion
 - c) Reference
 - d) None of these
- 6) Testing hypothesis is a _____.
 - a) Inferential statistics
 - b) Data preparation
 - c) Descriptive statistics
 - d) Data analysis
- 7) The quality of a problem is -
 - a) Clarity
 - b) Hypothesis oriented
 - c) Worth for solution
 - d) All the above
- 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) Hypothesis is -
 - a) A thoughtful statement
 - b) A temporary solution
 - c) A forwarding statement
 - d) All the above

- 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) The process of writing a research paper is -
 a) Scientific
 b) Original
 c) Unscientific
 d) Plagiarism
- 12) Before preparing your research report you consult with -
 a) Your Guide
 b) Your Predecessor's work
 c) Your Colleague
 d) All the above
- 13) The method that consists 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

- Q.2** What do you mean by research? Explain its significance in modern times? **14**
- Q.3** What is a hypothesis? What characteristics it must possess in order to be a good hypothesis? **14**
- Q.4** What do you understand by research report? Describe in detail, the layout of a research report, covering all relevant points? **14**
- Q.5 Write a short notes on following:** **14**
 a) Science and Logic
 b) Empirical Research
- Q.6 Write in brief on the following:** **14**
 a) Literature review
 b) Sampling design and fundamentals
- Q.7 Write an account on the following** **14**
 a) Primary data collection methods.
 b) Search engines for research.

Seat No.	
-----------------	--

M.Sc. (Semester - IV) (New) (CBCS) Examination Oct/Nov-2017
Environmental Science
WATERSHED MANAGEMENT

Day & Date: Friday, 24-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Answer any Five Question.
 2) All Questions carry equal marks.
 3) Question No. 1 is Compulsory.
 4) Attempt any two from Q.No.2, 3 and 4.
 5) Attempt any two from Q.No.5, 6 and 7.
 6) Draw Neat Labeled Diagrams wherever necessary.

Q.1 Select the answer among the following

14

- 1) The vulnerability of soils to water erosion depends on _____.
 a) Rainfall Intensity and Nature of Soil
 b) Rainfall Type and Temperature
 c) Water Availability and Nature of Soil
 d) Seasons and Nature of Soil
- 2) Land Capability Classification is a system of grouping soils primarily on the basis of their capability to produce common _____.
 a) Cash Crop and Pasture plants
 b) Cultivated Crop and Pasture plants
 c) Drought Resistant Crop and Pasture plants
 d) High Yielding Crop and Pasture plants
- 3) The Rational Method is used to calculate _____.
 a) Peak Surface Rainfall
 b) Peak Surface Runoff Rate
 c) Peak Surface Seepage Rate
 d) Peak Surface Rainfall Duration
- 4) The standard way of measuring rainfall or snowfall is the _____.
 a) Rain Meter
 b) Rain Geometer
 c) Rain Gauge
 d) Rain Gap
- 5) The area from which rainfall flows into a river, lake, or reservoir is called as _____.
 a) Water shadow region
 b) Water acceptor
 c) Catchment
 d) Catchment of fertility
- 6) Engineering practices followed for soil and water conservation are
 a) Terracing and Mulching
 b) Terracing and Strip Cropping
 c) Terracing and Banding
 d) Terracing and Vetiver Grass Planning

- 7) Which among the following is not the outcome as consequences of a degraded watershed?
- Erosion of soil and washed out of crops
 - Decrease in productivity of agriculture and pollution of streams
 - Siltation of river beds and flash floods
 - Frequent water logging and high evaporation rate by plants
- 8) Stream order is a technique to:
- Stop stream disturbance by scientific techniques
 - Classification of streams based on their location in drainage network
 - Prevent flow from running downhill
 - Allow flow of water on orderly channelization
- 9) _____ is the area of land where of the water that falls in it and drains off it goes to a common outlet.
- Watershed
 - River Mouth
 - Water Channel
 - Aquifer
- 10) Hydrograph means _____.
- Rainfall is plotted over time in minutes or hours
 - Recharge is plotted over time in minutes or hours
 - Discharge (rate of flow) is plotted over time in minutes or hours
 - Quantity of water is plotted over time in minutes or hours
- 11) Cropping methods in watershed areas should be based on _____.
- Land permeability, percentage of cover and vegetation type
 - Soil salinity and type of vegetation
 - Soil fertility, high yielding varieties and demand
 - Land compactness, percentage of moisture and vegetation type
- 12) Hydrological type of burning may be due to _____.
- Burning of dried parts
 - Prescribed burning of forests
 - Lightening, accidental and prescribed burning
 - Accidental burning of trees
- 13) _____ is an underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials from which groundwater can be extracted.
- Aquitard
 - Aquifer
 - Aqua pool
 - Confined pool
- 14) Alluvial Fans means _____.
- Stream flow in to a larger main valley and free to spread out
 - Stream flow and merges with river
 - Stream flow and meets with seawater
 - Fan like structure of watershed area

- Q.2** Which are he factor that affect watershed operations? Also discuss the objectives of watershed management and role of public participation in it. **14**
- Q.3** What are causes of soil erosion? Discuss in detail on medaling of erosion using Universal Soil Loss Equation. **14**
- Q.4** Explain in detail on rainfall pattern in India. Also elaborate on factors affecting runoff. **14**

- Q.5 Write a short notes on following:** **14**
- a) What are agronomic measures of soil and water conservation?
 - b) Which are important considerations under watershed management plan?
- Q.6 Answer the following in brief:** **14**
- a) Discuss general characteristics of watershed?
 - b) What are various engineering measures for soil and water conservation?
- Q.7 Write short notes on the following:** **14**
- a) Gully Plugging
 - b) Rainfall Parameters