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**M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE**

Introduction to Environment and Ecology (2328101)

Day & Date: Friday, 10-05-2024

Max. Marks: 60

Time: 03:00 PM To 05:30 PM

- Instructions:** 1) All questions are compulsory.
2) Figure to the right indicate full marks.

Q.1 A) Choose correct alternative.

08

- 1) National Park associated with rhinoceros is _____.
a) Valley of flowers b) Ranthambore
c) Corbett d) Kaziranga
- 2) Which of following types of forest (same sized) holds the most amount of carbon?
a) Boreal forest b) Mangrove
c) Temperate forest d) Tropical forest
- 3) World wildlife week is observed during
a) First week of October b) Last week of October
c) Third week of October d) First week of September
- 4) What is UNCED?
a) United Nations Conference on Education,
b) United Nations Conference on Environmental Day
c) United Nations Conference on Environment and Development
d) None of these
- 5) Wild Life Institute of India is located in _____.
a) Andaman b) Hyderabad
c) Dehradun d) Bangalore
- 6) E. O. Wilson's book which won the award for 'Best Book on Environmental issues'
a) Biodiversity b) Diversity of Life
c) Nature d) Man and Life
- 7) Indian Prime minister who played significant role in conservation of wild life _____.
a) Rajiv Gandhi b) Indira Gandhi
c) Manmohan Singh d) Vajpayee
- 8) Green revolution is associated with _____.
a) Sericulture b) Silviculture
c) fish culture d) Agriculture

B) Fill in the blanks.

04

- 1) _____ and water in the air react together to form carbonic acid.
- 2) Organisms which feed on secondary consumers are call _____.
- 3) _____ is defined as an ecological state of a species being unique to a specific geographic location.
- 4) UNFCCC stands for _____.

- Q.2 Answer the following questions. (Any Six) 12**
- a) Define Detritivores
 - b) Define Ecology
 - c) Types of Ecological Model
 - d) Define Sustainable Development
 - e) What is Population Ecology?
 - f) What is Ecological Niche?
 - g) What is terrestrial ecosystem?
 - h) Define Secondary consumers
- Q.3 Answer the following questions. (Any Three) 12**
- a) Explain the Objectives of Environmental Science.
 - b) Explain the role of women in Environmental Moments.
 - c) Discuss about the history of Environmental Education.
 - d) Role of Media in Environmental Education.
- Q.4 Answer the following questions. (Any Two) 12**
- a) What is bio-geochemical Cycle? Explain in brief role of sedimentary cycle in sustainable agriculture.
 - b) What is Biomes? Explain in brief the Desert Ecosystem?
 - c) Explain the cake and other ecological model.
- Q.5 Answer the following questions. (Any Two) 12**
- a) Explain in brief scope of Environmental Science.
 - b) Write in brief about human impact on environment and its consequences.
 - c) Explain the concept of RAMSAR convention with suitable example.

Seat No.	
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M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE

Environmental Chemistry & Instrumentation (2328102)

Day & Date: Monday, 13-05-2024

Max. Marks: 60

Time: 03:00 PM To 05:30 PM

- Instructions:** 1) All questions are compulsory.
 2) Figure to right indicate full marks.

Q.1 A) Multiple choice question.

08

- 1) The energy released in the form of nuclear radiations in addition to heat and light during nuclear reactions is known as _____.
 - a) Chemical energy
 - b) Nuclear energy
 - c) Heat energy
 - d) Electrical energy
- 2) The energy obtained from electric cells and batteries as a result of a chemical reaction is called _____.
 - a) Chemical energy
 - b) Nuclear energy
 - c) Heat energy
 - d) Electrical energy
- 3) Which of the following is the cause of soil pollution?
 - a) Ozone
 - b) Aerosol
 - c) Acid rain
 - d) None of the above
- 4) The uses of CFCs are _____.
 - a) Insulators
 - b) Aerosol propellants
 - c) Refrigerants
 - d) All of the above
- 5) The ozone layer is present in _____.
 - a) Mesosphere
 - b) Thermosphere
 - c) Stratosphere
 - d) None of the above
- 6) Which of the following statements is correct?
 - a) Atmosphere is the major reservoir for plants
 - b) Nitrogen is the most abundant nutrient for plants
 - c) Nitrogen cycle is a sedimentary cycle
 - d) All
- 7) Nitrogen is absorbed by the plants in the form of _____.
 - a) Ammonium
 - b) Nitrites
 - c) Nitrates
 - d) All
- 8) Nitrogen fixation is the conversion of _____.
 - a) N_2 to N
 - b) N_2 to NH_3
 - c) N_2 to NO_3^-
 - d) N_2 to urea

- B) Fill in the blanks.** **04**
- 1) Methods by which rusting of iron can be prevented are _____ and _____.
 - 2) The tendency for water molecules to form weak bonds and stick to each other is called _____.
 - 3) Chelatometry is a type of volumetric analysis wherein the _____ is used to determine the endpoint of the titration.
 - 4) Radioactivity is the spontaneous release of _____ from an unstable atom to get to a more stable state.

- Q.2 Answer the following. (Any Six)** **12**
- a) Write in brief on Molar solution. Molarity and normality.
 - b) Discuss the major and micro nutrients of soil.
 - c) Give informative account on pesticides.
 - d) Discuss the effect of modern agro technology on quality of soil.
 - e) Discuss monitoring techniques and methodology for water.
 - f) Discuss Saturated and Unsaturated hydrocarbons.
 - g) Discuss CFC and Ozone Chemistry.
 - h) Briefly discuss on water chemistry.

- Q.3 Answer the following.(Any Three)** **12**
- a) Write on unsaturated and saturated hydrocarbon.
 - b) Describe the chemistry of oil and water base paints.
 - c) Discuss polymers and drugs.
 - d) Explain Gibbs Energy.

- Q.4 Answer the following. (Any Two)** **12**
- a) Discuss the chemical properties of soil.
 - b) Briefly discuss the Potentiometry and Colorimetry.
 - c) Discuss the thermodynamics law.

- Q.5 Answer the following. (Any Two)** **12**
- a) Discuss the structure and composition of atmosphere.
 - b) Briefly discuss major water pollutants and their methods of analysis.
 - c) Briefly explain the various techniques of chromatography.

Seat No.	
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**M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE**

Current Environmental Issues and Problems of India (2328107)

Day & Date: Wednesday, 15-05-2024

Max. Marks: 60

Time: 03:00 PM To 05:30 PM

- Instructions:** 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.1 A) Choose correct alternative.

08

- 1) _____ is a waste disposal method where solid organic wastes are converted to the residue and gaseous products through combustion.
 - a) Incarnation
 - b) Incineration
 - c) Incarceration
 - d) Incubation
- 2) Greenhouse gases are those that absorb and emit infrared radiation. Examples include _____.
 - a) Nitrogen
 - b) Ozone
 - c) Argon
 - d) None of the above
- 3) The main cause of acid rain is _____.
 - a) soil pollution
 - b) water pollution
 - c) air pollution
 - d) All of the above
- 4) What does e- waste stand for?
 - a) Environment waste
 - b) Electronic waste
 - c) Equipment waste
 - d) None of the above
- 5) Which of the following particles is called the particulate pollutants?
 - a) Ozone
 - b) Radon
 - c) Fly Ash
 - d) Ethylene
- 6) The people living near the banks of river are 2nd most prone to which of the following disease in the World?
 - a) Cholera
 - b) Typhoid
 - c) Cancer
 - d) Malaria/Dengue
- 7) Following is responsible for pollution in water bodies?
 - a) Throw garbage in water bodies like plastic, chemicals etc.
 - b) Improvisation of Industrial Sewage management system
 - c) Dispose of medical waste properly
 - d) Report water polluters and support environmental charities
- 8) What is not a characteristic of a corporate social responsibility framework?
 - a) Retaining the status quo
 - b) Understanding society
 - c) Harnessing diversity
 - d) Building capacity

- B) Fill in the blanks OR Write True / False. 04**
- 1) Nuclear Power is a ____ energy resource.
 - 2) ____reservoirs contains the most water.
 - 3) Chipko Andolan was associated with the conservation of wild animals such as tigers and lions.
 - a) True
 - b) False
 - 4) The goal of life cycle assessment is to incorporate the environment impact of products or services into product-design or service-design decision-making.
 - a) True
 - b) False

- Q.2 Answer the following. (Any Six) 12**
- a) What are the features of desertification?
 - b) What are the threats of biological warfare?
 - c) What exactly do these 'sustainable development goals' or SDGs mean?
 - d) What are the classification of droughts?
 - e) What are any four laws for protection of environment in India?
 - f) What was the major issue of Silent Valley movement?
 - g) What are the benefits of sustainability?
 - h) What are the aims of global environmental governance?

- Q.3 Answer the following. (Any Three) 12**
- a) Explain causes of global warming.
 - b) Explain main purpose of the IUCN?
 - c) Write note on Rainwater Harvesting.
 - d) Write note on Carbon Footprint Calculations.

- Q.4 Answer the following. (Any Two) 12**
- a) Explain in detail of role of UNEP in environment conservation and protection.
 - b) Write detail note on Silent Valley Movement.
 - c) Ecological and Carbon Footprint. Explain in detail.

- Q.5 Answer the following. (Any Two) 12**
- a) How does food crisis and increasing population consider environmental issues in India? Explain broadly.
 - b) What is rainwater harvesting? Explain various benefits of rainwater harvesting.
 - c) Explain salient features of Narmada Bachao Andolan.

Seat No.	
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M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE
Biodiversity and Conservation (2328108)

Day & Date: Wednesday, 15-05-2024
 Time: 03:00 PM To 05:30 PM

Max. Marks: 60

Instructions: 1) All questions are compulsory.
 2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. (MCQ)

08

- 1) The presence of all of the following tend to increase species diversity except _____.
 a) Moderate disturbances b) Competitive exclusion
 c) Keystone predators d) Patchy environments
- 2) Genetic variation between distinct populations of same species is known as _____.
 a) Species diversity b) Ecosystem diversity
 c) Biodiversity d) Genetic diversity
- 3) Who introduced the concept of biodiversity hotspot?
 a) Christopher Columbus b) Norman Myers
 c) Charles Darwin d) WWF
- 4) 'Red Data Book' is published by _____.
 a) IUCN b) WWF
 c) BNHS d) IUPAC
- 5) The basic strategies of biodiversity conservation is/are _____.
 a) Ex-situ b) In- situ
 c) Both a) and b) d) None of these
- 6) In India, sacred forests are located in _____.
 a) Maharashtra b) Meghalaya
 c) Karnataka d) All of these
- 7) Extinction of species includes _____.
 a) anthropogenic extinction b) mass extinction
 c) natural extinction d) All of these
- 8) _____ forests are known to be a 'Forest that never burns'.
 a) Evergreen Forest b) Tundra forest
 c) Coniferous forest d) Deciduous forest

B) Write True / False.

04

- 1) The type of diversity including all the different kinds of living things found in a certain habitat is called as Species Diversity.
- 2) A taxon with restricted geographical distribution is termed as Extinct.
- 3) Biosphere reserve has buffer zone.
- 4) If certain species disappear, there may not be an impact on other species and the ecosystem may not be affected.

- Q.2 Answer the following. (Any Six) 12**
- a) Discuss on Rhino project.
 - b) Explain Microbial diversity.
 - c) What is keystone species? Give its example.
 - d) Discuss the concept of richness and evenness diversity.
 - e) Write the affecting factors of biodiversity.
 - f) Describe Gama diversity.
 - g) Write note on Biodiversity hot-spots.
 - h) What is mean by Bio prospecting?
- Q.3 Answer the following. (Any Three) 12**
- a) Write on Biodiversity Legislation in India.
 - b) Discuss the Gene pools and Germplasm bank.
 - c) Enlist and explain the causes of extinction of biodiversity.
 - d) Describe wildlife habitats and their conservation.
- Q.4 Answer the following. (Any Two) 12**
- a) Give the major types of forest in India.
 - b) Write in brief about International Conventions on biodiversity.
 - c) Write the informative note on diversity trends of different ecosystem.
- Q.5 Answer the following. (Any Two) 12**
- a) Describe the characteristics of Biosphere reserves? Discuss any two Biosphere reserves in India?
 - b) Write about the Role of Forest Department in Conservation.
 - c) Discuss the Species, Genetic and Pattern diversity.

Seat No.	
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M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE
Research Methodology (2328103)

Day & Date: Friday, 17-05-2024
 Time: 03:00 PM To 05:30 PM

Max. Marks: 60

Instructions: 1) All Questions are compulsory.
 2) Figure to right indicate full marks.

Q.1 A) Choose correct alternative.

08

- 1) Generalized conclusion on the basis of a sample is technically known as:
 - a) Data analysis and interpretation
 - b) Limit inference
 - c) Arithmetical inference
 - d) All of the above
- 2) How is random sampling helpful?
 - a) Judiciously accurate
 - b) An reasonable method of data collection
 - c) Free from private biases
 - d) All of the above
- 3) Bibliography given in a research report:
 - a) Displays vast information of the researcher
 - b) Helps those interested in further research
 - c) Has no significance to study
 - d) All the above
- 4) What do you understand by the term "Anusandhan"?
 - a) Goal-oriented
 - b) Following an aim
 - c) Reaching an aim
 - d) Requesting to achieve an aim
- 5) A common test in research demands much priority on

a) Consistency	b) Serviceability
c) Objectivity	d) All of the above
- 6) Which of the following does not correspond to characteristics of research?
 - a) Research is not inert
 - b) Research is methodical
 - c) Study is not a problem-oriented
 - d) Research is not a process
- 7) Which one among the following variables cannot be expressed in quantitative terms?

a) Arithmetical Aptitude	b) Married Status
c) Socio-economic Rank	d) Professional Attitude

- 8) Action-research is:
- Practical research
 - A research carried out to solve immediate problems
 - A longitudinal study
 - All the above

B) Fill in the blanks.**04**

- _____ is the specific procedures or techniques used to identify, select, process, and analyze information about a topic.
- _____ is a type of intellectual property consisting of a recognizable sign, design, or expression that identifies products or services.
- _____ is a formal meeting in which many people gather in order to talk about ideas or problems related to a particular topic usually for several days.
- _____ is a method of gathering information using relevant questions from a sample of people with the aim of understanding populations as a whole.

Q.2 Answer the following. (Any Six)**12**

- What is the research hypothesis?
- Explain the significance of research objectives in innovative research.
- How to identify a research problem?
- What is general format for research proposal?
- Discuss the importance of conference innovative research ways
- What is a copyright?
- What is geographical indicator?
- Why publications of an article is important?

Q.3 Answer the following. (Any Three)**12**

- How to prepare a plagiarism free research paper?
- What are the ways to arrange bibliography for dissertation?
- What is the significance of filing a patent?
- Explain the need for registration of intellectual property rights.

Q.4 Answer the following. (Any Two)**12**

- What are the elements of research methodology?
- Write an account on applications of advanced instrumental techniques in scientific research.
- What are the important conditions while writing a dissertation?

Q.5 Answer the following. (Any Two)**12**

- What are general methods for carrying out scientific research?
- Discuss the requirements and process for filing patent.
- Explain various aspects considered while writing a research article.

Seat No.	
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M.Sc. (Semester - I) (Old) (CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE
Environmental Chemistry & Instrumentation (MSC20102)

Day & Date: Monday, 13-05-2024
 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos.1 and 2 are compulsory.
 2) Attempt any Three questions from Q.No.3 to Q.No.7.
 3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative.

10

- 1) Which of the chemical used for dechlorination _____
 a) Carbon dioxide b) Bleaching Powder
 c) sulphur Oxide d) Chloramines
- 2) Standard BOD measures at _____
 a) 20°C b) 25 °C
 c) 30°C d) 35 °C
- 3) Which of the following process Contributes to CO₂ into the atmosphere
 a) Fog & Combustion b) Fermentation
 c) Putrefaction d) All
- 4) Organic carbon is rich in horizon _____
 a) B Horizon b) C Horizon
 c) A Horizon d) A and A₀ Horizon
- 5) Which fertilizer produce acidity in soil?
 a) Ammonium sulfate
 b) Sodium nitrate
 c) Calcium ammonium nitrate
 d) Calcium nitrate
- 6) Both CO₂ and H₂ gases are _____
 a) heavier than air b) colourless
 c) acidic in nature d) soluble in water
- 7) Gibbs free energy is also known as _____
 a) Free energy b) Free entropy
 c) Free enthalpy d) Free motion

- 8) A substance present in greater than the usual (normal) concentration is known as _____
a) Contaminant b) Receptor
c) Pollutant d) Reservoir
- 9) _____ is a longer-term reservoir in which a substance is essentially immobilized and such a repository may be natural or human-made
a) Absorption b) Adsorption
c) Sink d) Receptor
- 10) A material that has a very porous structure and is an adsorbent for organic matter and certain dissolved gases is called as _____
a) Carbon b) activated carbon
c) charcoal d) coal

B) Fill in the blanks.**06**

- 1) Mesosphere layer of the atmosphere contains the ozone layer (TRUE / FALSE)
- 2) Accumulation of sewage leads to water pollution and spread of various waterborne diseases (TRUE / FALSE)
- 3) Accumulated heavy metals cannot be metabolized by organisms. (TRUE / FALSE)
- 4) Atom is the smallest part of a compound that retains all the properties of the compound. (TRUE / FALSE)
- 5) Sulphur dioxide is a greenhouse gas. (TRUE / FALSE)
- 6) Biomass is the most commonly accessible source of renewable energy. (TRUE / FALSE)

Q.2 Answer the following.**16**

- a) Write brief on soil profile?
- b) Write in soil profile and its soil horizons?
- c) Write in brief on Chemical Oxygen Demand?
- d) Acid -Base reaction?

Q.3 Answer the following.**16**

- a) Explain the importance of DO, BOD and COD parameters in water and waste water treatment?
- b) Explain principle, process and significance of sedimentation.

Q.4 Answer the following.**16**

- a) What is SAR and CEC in soil?
- b) Explain second law of thermodynamics.

- Q.5 Answer the following.** **16**
- a) What is organic matter? Explain humification process in organic matter.
 - b) Explain in detail Gibbs free energy? Give its significance.
- Q.6 Answer the following.** **16**
- a) Explain structure and composition of atmosphere.
 - b) Explain principle and significance of Nernst Distribution Law.
- Q.7 Answer the following.** **16**
- a) Explain in detail greenhouse gases sources and their impacts.
 - b) What is photochemical smog? Give its effects.

Seat No.	
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**M.Sc. (Semester - II) (New) (NEP CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE**

Water and Wastewater Treatment Technology (2328201)

Day & Date: Thursday, 09-05-2024
Time: 11:00 AM To 01:30 PM

Max. Marks: 60

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.1 A) Choose correct alternative.

08

- 1) Aerobic bacterias _____.
 - a) flourish in the presence of free oxygen
 - b) consume organic matter as their food
 - c) oxidise organic matter in sewage
 - d) All the above.
- 2) The rate of accumulation of sludge in septic tanks is recommended as _____.

a) 30 litres/person/year	b) 25 litres/person/year
c) 30 litres/person/month	d) 25 litres/person/month
- 3) How is COD calculated?
 - a) Waste water is oxidized chemically using sodium in acid solutions
 - b) Waste water is oxidized chemically using dichromate in acid solutions
 - c) Waste water is oxidized chemically using bromine in acid solutions
 - d) Waste water is oxidized chemically using strontium in acid solution
- 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 of the above
- 5) No treatment of the sewage is given if dilution factor is _____.

a) Less than 150	b) Between 150 to 200
c) Between 200 to 300	d) More than 500
- 6) The coagulant which is generally not used for treating the sewage, is _____.

a) Alum	b) Ferric chloride
c) Ferric sulphate	d) Chlorinated copperas
- 7) During preliminary treatment of a sewage _____.
 - a) Oil and grease are removed from skimming tanks
 - b) Floating materials are removed by screening
 - c) Grit and sand are removed by grit chambers
 - d) All the above
- 8) Removal of oil and grease from sewage, is known _____.

a) screening	b) skimming
c) filtration	d) None of these

B) Fill in the blanks OR Write true/false. 04

- 1) The quality of the fish habitat begins to increase when the dissolved oxygen concentration drops below 4 or 5 mg L⁻¹.
- 2) In surface filtration, the size of particles retained is higher than the mean pore size of the medium.
- 3) Reverse osmosis helps in mineralizing water.
- 4) Trickling filter can also be called as a biofilter.

Q.2 Answer the following. (Any Six) 12

- a) What are the main objectives of treating water?
- b) What are the various unit operations and unit processes used in the treatment of water?
- c) What are the common coagulants used in water treatment?
- d) What is coagulation?
- e) Define Flocculation.
- f) List out advantages of rapid sand filter?
- g) Differentiate between sterilization and disinfection?
- h) What is break point chlorination?

Q.3 Answer the following. (Any Three) 12

- a) What is screening and types of screening?
- b) Define activated sludge process with their operation including advantages and disadvantages.
- c) Explain, with the help of neat sketch, the construction and working of a conventional trickling filter.
- d) What do you understand by oxidation pond and explain the process of oxidation and stabilization?

Q.4 Answer the following. (Any Two) 12

- a) Explain, with the help of a flow chart, various processes involved in sludge treatment and disposal.
- b) What do you understand by sludge thickening? sketch the gravity-sludge thickener.
- c) Mention the various methods of sludge disposal and explain any two methods of sludge disposal.

Q.5 Answer the following. (Any Two) 12

- a) Lime soda or Zeolite process of water softening.
- b) Methods of coagulant feeding.
- c) Working principle of slow sand filter with the help of neat sketch.

Seat No.	
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Set **P**

M.Sc. (Semester - II) (New) (NEP CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE

Remote Sensing, GIS, GPS in Environmental Science (2328202)

Day & Date: Saturday, 11-05-2024
Time: 11:00 AM To 01:30 PM

Max. Marks: 60

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative.**08**

- 1) GIS deals with _____ kind of data.
 - a) Numeric data
 - b) Binary data
 - c) Spatial data
 - d) Complex data
- 2) What is the orbital distance of a geostationary satellite?
 - a) 26,000 km
 - b) 26,000 m
 - c) 36,000 km
 - d) 36,000 m
- 3) A spectral band is _____.
 - a) single wavelength
 - b) frequency of the radiant energy
 - c) a range of wavelengths
 - d) long wavelength
- 4) Which of the following is Indian Remote Sensing Satellite?
 - a) LANDSAT
 - b) Resourcesat
 - c) QUICKBIRD
 - d) EYESAT
- 5) Which region of electromagnetic spectrum is not yet fully used?
 - a) Visible region
 - b) Microwave region
 - c) Infrared region
 - d) Near infrared region
- 6) A sensor is a device that detects _____.
 - a) electromagnetic radiations
 - b) atmospheric energy
 - c) atmospheric temperature
 - d) frequency
- 7) In visible region having wave length is _____.
 - a) 0.4 to 0.7 micrometre
 - b) 0.8 to 1.2 micrometre
 - c) 0.24 to 0.52 micrometre
 - d) 0.22 to 0.32 micrometre
- 8) Remote sensing uses which of the following waves in its procedure?
 - a) Electric field
 - b) Sonar waves
 - c) Gamma-rays
 - d) Electro-magnetic waves

- B) Write True/False. 04**
- 1) Remote sensing is a technique of collection of information about an object, without a physical contact.
 - 2) An aerial photograph, in broad terms, is any photograph taken from the air.
 - 3) Vector and Raster data models used in GIS.
 - 4) Forest fire mapping is an application of GIS
- Q.2 Answer the following. (Any Six) 12**
- a) What is contiguity and containment?
 - b) Concept of Arc, Node.
 - c) Write types of attribute data.
 - d) Define Remote Sensing? Write about spatial resolution.
 - e) Write any two application of GPS.
 - f) Concept of Unmanned Aircraft Systems.
 - g) What is Trigonometry and its two applications?
 - h) Write any two components of GIS.
- Q.3 Answer the following. (Any Three) 12**
- a) Write a note on History of development of remote sensing in India.
 - b) Elaborate the raster data model with giving suitable examples.
 - c) Describe the principles of Remote Sensing.
 - d) Write any four characteristics of Indian Remote Sensing Satellites.
- Q.4 Answer the following. (Any Two) 12**
- a) Write in details about the spectral signatures with giving suitable examples.
 - b) Levels of Measurement
 - c) Advantages of Topology
- Q.5 Answer the following. (Any Two) 12**
- a) Describe the elements of image interpretation.
 - b) Explain the Vector data model in detail.
 - c) Discuss the applications of GIS.

Seat No.	
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M.Sc. (Semester - II) (New) (NEP CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE

Environmental Pollution and Management (2328208)

Day & Date: Tuesday, 14-05-2024

Max. Marks: 60

Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. (MCQ) 08

- 1) BOD is _____ in polluted water and _____ in potable water.
 - a) more, less
 - b) less, medium
 - c) Medium, more
 - d) less, more
- 2) Which pollutant gas dissolved with human blood faster than oxygen?
 - a) SO₂
 - b) CO
 - c) O₃
 - d) N₂O
- 3) The major photochemical oxidant is:
 - a) Ozone
 - b) Hydrogen peroxide
 - c) Nitrogen oxides
 - d) Carbon monoxide
- 4) Which of the following is a likely characteristic of hazardous waste?
 - a) ignitability
 - b) Corrosively
 - c) Reactivity
 - d) Any of the above
- 5) CPCB, a technical agency works under the Ministry of _____.
 - a) Environment, Forest and Climate Change.
 - b) Health.
 - c) Rural Development.
 - d) Urban Development.
- 6) Which two gases are responsible for acid rain?
 - a) So_x & NO_x
 - b) HC & PAN
 - c) CO & CO
 - d) Smog & O₂
- 7) Sound becomes hazardous noise pollution at decibels:
 - a) Above 80
 - b) Above 30
 - c) Above 100
 - d) Above 120
- 8) A river with high BOD value is _____.
 - a) Highly polluted
 - b) Highly clean
 - c) Highly productive
 - d) None of these

B) Fill in the blanks OR Write True or False.**04**

- 1) _____ means smoke + fog.
- 2) _____ indicator is used for Hardness titration.
- 3) Most Probable Number test indicates presence of _____ bacteria in water.
- 4) _____ is the coolant major gas responsible for ozone depletion.

Q.2 Answer the following. (Any Six)**12**

- a) What is photochemical smog?
- b) What are the sources of oil pollution in water?
- c) What is Bioremediation?
- d) What is Soil Salinity?
- e) Explain the Sources of E-waste.
- f) Explain the sources of Radiation Pollution.
- g) What is Carbon Sequestration?
- h) Write about clean coal technology.

Q.3 Answer the following. (Any Three)**12**

- a) Write effects of noise pollution on human health.
- b) What are the Sources and effects of Thermal pollution?
- c) Explain the role of Organic soil pollutants.
- d) Explain physical parameters of water.

Q.4 Answer the following. (Any Two)**12**

- a) Write in detail with suitable diagram about scrubbers and electrostatic Precipitators.
- b) How does Bioremediation, and Bio stimulation can be helpful for water treatment? Explain.
- c) Explain the characteristics of Hazardous waste with its disposal mechanism.

Q.5 Answer the following. (Any Two)**12**

- a) Explain the sources of Greenhouse gases emission? Also, explain the effects on environment due to presence of greenhouse gases in atmosphere.
- b) Explain in detail about municipal waste minimization technologies.
- c) Elucidate in detail about classification of air pollutants with example.

Seat No.	
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M.Sc. (Semester - II) (New) (NEP CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE

Environmental Law, Acts, Ethics and Polices (2328209)

Day & Date: Tuesday, 14-05-2024
 Time: 11:00 AM To 01:30 PM

Max. Marks: 60

Instructions: 1) All questions are compulsory.
 2) Figure to right indicate full marks.

Q.1 A) Choose correct alternative. (Any Six) 12

- 1) Which principle holds entities strictly liable for environmental damage regardless of fault or negligence?
 - a) Precautionary principle
 - b) Polluter pays principle
 - c) Absolute liability principle
 - d) Strict liability principle
- 2) Which law in India mandates that industries must take out insurance policies for any damage caused by accidents involving hazardous substances?
 - a) The Water (Prevention and Control of Pollution) Act, 1974.
 - b) The Air (Prevention and Control of Pollution) Act, 1981.
 - c) The Environment (Protection) Act, 1986.
 - d) The Public Liability Insurance Act, 1991.
- 3) What is the primary focus of the Water Cess Form?
 - a) Noise pollution management.
 - b) Solid waste management.
 - c) Biomedical waste management.
 - d) Water pollution control.
- 4) What is one of the ethical dilemmas concerning pollution addressed by Environmental Ethics?
 - a) Whether pollution should be entirely eradicated.
 - b) Balancing economic benefits with environmental harm.
 - c) Prioritizing industrial growth over public health.
 - d) Ignoring pollution as an ethical concern.
- 5) What is the main focus of Environmental Ethics?
 - a) Conservation of cultural heritage.
 - b) Promotion of economic growth.
 - c) Ethical treatment of the environment and its resources.
 - d) Protection of human rights.
- 6) Which application form would a facility handling medical waste typically use?
 - a) MSW application.
 - b) Biomedical waste application.
 - c) Hazardous waste application.
 - d) E-waste application.

- 7) Which act in India protects and improves the environment and prevents hazards to human beings, other living creatures, plants, and property?
 - a) The Water (Prevention and Control of Pollution) Act, 1974
 - b) The Air (Prevention and Control of Pollution) Act, 1981
 - c) The Environment (Protection) Act, 1986
 - d) The Public Liability Insurance Act, 1991
- 8) Which principle advocates that the polluter should bear the expenses of carrying out pollution prevention and control measures?
 - a) Precautionary principle
 - b) Polluter pays principle
 - c) Absolute liability principle
 - d) Strict liability principle

B) Fill in the blanks OR Write true/ false.**04**

- 1) The G20 is a group of 20 developing countries working collaboratively on environmental protection and sustainability initiatives.
- 2) The Biological Diversity Act of 2002 focuses on managing and conserving water resources.
- 3) A water cess form is used to obtain consent for hazardous waste management.
- 4) The National Environmental Policy primarily focuses on the management and conservation of forests.

Q.2 Answer the following.(Any Six)**12**

- a) What is primary goal of the Kyoto protocol.
- b) How can we encourage the sustainable use of resources?
- c) Give Key provisions of Air Act.
- d) What does the term municipal solid waste refer to?
- e) What does the "art of ethics" mean in Human life and its Environment?
- f) What is the purpose of Noise Pollution Rules, and what do they regulate?
- g) Give the significance of PIL.

Q.3 Answer the following. (Any Three)**12**

- a) Describe the significance of the Conference of Parties (CoP) in shaping global environmental governance.
- b) Explain the significance of the National Water Policy in addressing water resource management and conservation. Give examples.
- c) Discuss the key ethical concepts relevant to environmental decision-making and resource management.

Q.4 Answer the following.(Any Two)**12**

- a) Explain the concept of a Net Zero mission and carbon neutrality. How do these initiatives contribute to mitigating climate change?
- b) Assess the role of international conventions, explain anyone in detail.
- c) Discuss the Biological Diversity Act 2002 legislative frameworks aimed at the conservation of natural resources.

Q.5 Answer the following.(Any Two)**12**

- a) Analyze the key provisions and objectives of the Hazardous Waste Management and Handling Rules.
- b) Explain the role of the Plastic Regulation Application in ensuring adherence to environmental regulations and monitoring.
- c) What is the central board for prevention and control of Air pollution?

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Set **P**

**M.Sc. (Semester - II) (Old) (CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE**

Remote sensing, GIS & GPS in Environmental Science (MSC20206)

Day & Date: Tuesday, 14-05-2024

Max. Marks: 80

Time: 11:00 AM To 02:00 PM

- Instructions:** 1) Q. Nos.1 and 2 are compulsory.
2) Attempt any Three questions from Q.No.3 to Q.No.7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative.**10**

- 1) Which of the following field is used by the EM waves?
 - a) Solar field
 - b) Polarized field
 - c) Electric field
 - d) Micro field
- 2) Polar orbiting satellites are generally placed at an altitude range of _____ .
 - a) 7-15 km
 - b) 7000-15000 km
 - c) 700-1500 km
 - d) 70-150 km
- 3) The ratio of the total solar radiant energy returned by a planetary body to the total radiant energy incident on the body, the called _____.
 - a) Reflectance
 - b) Reflectance factor
 - c) Albedo
 - d) Convection
- 4) Which of the following is not a reason why remote sensing is ideal use in physical geography?
 - a) It can be applied at any scale.
 - b) It minimizes the need for fieldwork in dangerous, isolated and sensitive area.
 - c) It can monitor change over time.
 - d) It will always be more reliable than fieldwork studies.
- 5) What is the full form of NRSC?
 - a) National Remote Sensing Centre.
 - b) National River Studies Centre.
 - c) National Rangeland Studies Centre.
 - d) National Reservoir Centre.
- 6) Which of the following acts a benefit of GIS?
 - a) Maintaining geo spatial data.
 - b) Data Sharing
 - c) Accurate data information
 - d) Presence of data retrieval service

SLR-HI-19

- 7) Study of geometric objects will come under the category of _____.
 - a) Surveying
 - b) Cartography
 - c) Surface geometry
 - d) Topology
- 8) Which of the following is used to extract features and their attributes from one layer using a polygon from another as the boundary of the output?
 - a) Join
 - b) Merge
 - c) Union
 - d) Clip
- 9) Which of the following formats can be used for GIS output?
 - a) JPEG
 - b) PDF
 - c) GIF
 - d) All above
- 10) _____ is the full form of GPS?
 - a) Global Positioning System
 - b) Global Point System
 - c) Grid level Positioning System
 - d) None of the above

B) Write true/false

06

- 1) Microwave Remote Sensing is a type of Remote Sensing.
- 2) Photogrammetry is the acquiring information of an object using Topographical maps.
- 3) Vector data model is not related to GIS
- 4) Nominal and ordinal are types of scales.
- 5) Environmental degradation mapping is a type of GIS application.
- 6) Gagan is India's GPS.

Q.2 Answer the following.

16

- a) Concept of topology
- b) Raster data query.
- c) Importance of Topology.
- d) Spatial and Non-spatial data.

Q.3 Answer the following.

- a) Write in detail about Vector data model.
- b) Write in detail about Raster data model.

08

08

Q.4 Answer the following.

- a) Levels of Measurement.
- b) Write about types of geographical data.

08

08

Q.5 Answer the following.

- a) Write in detail about history of GIS.
- b) Write the applications of Remote Sensing.

08

08

Q.6 Answer the following.

- a) Describe the Characteristics of regions of electromagnetic spectrum. **08**
- b) Examine the Utility of Geographic information system. **08**

Q.7 Answer the following.

- a) Explain advantages and disadvantages of air-based platforms. **08**
- b) What is atmospheric windows? Explain the energy interaction with atmosphere and earth surface. **08**

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Set P

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE

Environmental Pollution, Monitoring and Control (MSC020301)

Day & Date: Friday, 10-05-2024
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos 1 and 2 are compulsory.
 2) Attempt any three questions from Q. No. 3 to Q. No. 7.
 3) Figures to the right indicate full marks.

Q.1 A) Choose the correct alternatives from the options. 10

- 1) The groundwater of the largest parts of Eastern India is contaminated by: _____.
 - a) Nickel
 - b) Mercury
 - c) Lead
 - d) Arsenic
- 2) Which pathogenic microbe's presence in water indicates contamination?
 - a) Volvox
 - b) Chlorella
 - c) Spirogyra
 - d) Coliform Bacteria
- 3) Which disease amongst the following is caused by drinking contaminated water?
 - a) Diarrhea
 - b) Typhoid
 - c) Polio
 - d) All of the above
- 4) The layer of atmosphere between 10km to 50km above the sea level is called as _____.
 - a) troposphere
 - b) thermosphere
 - c) stratosphere
 - d) mesosphere
- 5) The concentration of dissolved oxygen in cold water can go up to _____.
 - a) 14 ppm
 - b) 8 ppm
 - c) 10 ppm
 - d) 16 ppm
- 6) Formation of London smog takes place in _____.
 - a) winter during day time
 - b) summer during day time
 - c) summer during morning time
 - d) winter during morning time
- 7) Brewery and sugar factory waste alter the quality of a water body by increasing _____.
 - a) temperature
 - b) turbidity
 - c) pH
 - d) COD and BOD
- 8) In a coal-fired power plant electrostatic precipitators are installed to control the emission of _____.
 - a) SO₂
 - b) NO₂
 - c) SPM
 - d) CO

- 9) DDT is a major contributor to Pollution because of _____.
a) It kills useful microorganisms
b) It destroys valuable species of worms
c) It is nonbiodegradable
d) It interferes with pesticides
- 10) How are PAHs related to Soil Pollution?
a) They are carcinogenic organic compounds
b) They are fertilizer wastes
c) They are inorganic wastes from industries
d) They are harmful metals that pollute the soil

B) Write True or False.**06**

- 1) Ozone layer present in mesosphere.
- 2) Wet scrubbers are classified into three types.
- 3) Four horizons are present in soils profile.
- 4) Phyto-remediation is eco-friendly technology.
- 5) Ballast water is one of the causes of marine pollution.
- 6) National Environmental policy established in 2010.

Q.2 Answer the followings.**16**

- a) Discuss the CPCB standards provided for industrial effluent.
- b) What is working principle of fabric filters/ bag filters?
- c) What is lime sludge? How does liming affects the soil?
- d) Explain the various methods used in phytoremediation.

Q.3 Answer the followings.

- a) What is ground water restoration? Explain the strategies used for groundwater bioremediation.
- b) What is radio activity? Describe Half-life period.

08**08****Q.4 Answer the followings.**

- a) What is hazardous waste? How organic toxic substances are disposed with advanced scientific methods?
- b) Define oil spills? Explain the role of surfactant in remediation of oil spill site.

08**08****Q.5 Answer the followings.**

- a) How meteorological characters effects on dispersion of air pollutants?
- b) Write working principle, advantages & disadvantages with labeled diagram of wet scrubber.

08**08****Q.6 Answer the followings.**

- a) Write working principle, advantages & disadvantages with labeled diagram of clarifier in waste water treatment.
- b) What are the methods used for municipal solid waste? Add note on 3R principle.

08**08**

Q.7 Answer the followings.

- a)** Explain in detail role of microorganism in heavy metal transformation. **08**
- b)** What are chemical dispersant? How are chemical dispersants applied in remediation of Marine pollution? **08**

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No.

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE
Environmental Microbiology, Biotechnology & Nanotechnology
(MSC020302)

Day & Date: Monday, 13-05-2024
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos. 1 and 2 are compulsory.
 2) Attempt any three questions from Q. No. 3 to Q. No. 7
 3) Figure to right indicate full marks.

Q.1 A) Choose correct alternative.**10**

- 1) Which of the following is symbiotic nitrogen fixing bacteria?
 - a) Clostridium sp.
 - b) Rhizobium
 - c) Azotobacter
 - d) All of these
- 2) Phytoremediation means use of _____ for bioremediation.
 - a) plastic
 - b) plants
 - c) photons
 - d) All of these
- 3) In the process of biogas fermentation following which bacteria used?
 - a) Halophiles
 - b) Cyanobacteria
 - c) Methanogens
 - d) Vibrio bacteria
- 4) Mycology is the branch of study which deals with study of _____.
 - a) Algae
 - b) Fungi
 - c) Bryophytes
 - d) Pteridophytes
- 5) Which of them is Gram negative bacterial plant pathogen?
 - a) Corynebacterium
 - b) Fusarium oxysporum
 - c) Xanthomonas
 - d) Plasmodium viticola
- 6) Which of the following bacteria is considered for biological leaching process?
 - a) Ferrobacillus ferrooxidans
 - b) T. thiooxidans
 - c) T. ferrooxidans
 - d) All of these
- 7) The most and common fungal biopesticides is used as?
 - a) E. Coli
 - b) Thuriangiensis
 - c) Trichoderma sp
 - d) None of the above
- 8) The conversion of N₂ to NH₃ is _____.
 - a) Nitrogen fixation
 - b) Nitrification
 - c) Denitrification
 - d) Nitrogen reduction
- 9) A process using microbes to convert toxic waste into non-toxic or less toxic compound is called as _____.
 - a) precipitation
 - b) bioremediation
 - c) complement fixation
 - d) agglutination
- 10) Bioaugmentation involves _____.
 - a) addition of microbes to cleanup site
 - b) removal of microbes to clean site
 - c) plant usage for bioremediation
 - d) none of these

- B) Fill in the blanks OR Write True/False. 06**
- 1) *Escherichia* bacterium is used in the production of insulin by genetic engineering. True / False
 - 2) The first clinical application of gene therapy over a 4-year-old girl was for Adenosine deaminase deficiency. True / False
 - 3) Purple Rice is a genetically modified crop. True / False
 - 4) The DNA fragments have sticky ends due to sharing pair bases. True / False
 - 5) Conjugation is the term used to describe the process by which bacteria transfer genetic material to one another. True / False
 - 6) Natural attenuation is a type of bioremediation that relies on naturally occurring microorganisms to degrade contaminants without human intervention. True / False
- Q.2 Answer the following. 16**
- a) Write a note on fermentation?
 - b) What is geomicrobiology?
 - c) What do you mean by bioleaching?
 - d) What is the concept of green nanotechnology?
- Q.3 Answer the following.**
- a) Explain in detail structure, distinctive characteristics of protozoa, algae, bacteria, fungi and viruses? 08
 - b) Give an account Culture media and its types and applications in the environment. 08
- Q.4 Answer the following.**
- a) Explain in detail biomethylation and how microbes can be useful in treating contaminated soil? 08
 - b) Elaborate phytoremediation technology for domestic as well as industrial wastewater treatment? 08
- Q.5 Answer the following.**
- a) Discuss in detail about scope of environmental biotechnology and nanotechnology in environmental science? 08
 - b) Write a detail note on Prokaryotes and Eukaryotes with neat and labelled diagram? 08
- Q.6 Answer the following.**
- a) Write note on Gram positive and Gram negative? 08
 - b) Discuss in detail fuel cell? Explain applications of Nanomaterial in micro fuel cell. 08
- Q.7 Answer the following.**
- a) Write note on nanoparticles for environmental remediation with case studies? 08
 - b) Explain in detail on Environmental factors affecting microbial growth and microbial adaptations to extreme environments? 08

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**M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE**

Statistical Methods in Earth & Environmental Science (MSC020306)

Day & Date: Wednesday, 15-05-2024
Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.
4) Scientific calculator is allowed for calculations.

Q.1 A) Fill in the blanks by choosing correct alternatives given below. 10

- 1) _____ is the main part of the table.

a) Box head	b) Body
c) Foot Note	d) Stub
- 2) What type of data do you need for a chi-square test?

a) Ordinal	b) Categorical
c) Interval	d) Scales
- 3) A hypothesis may be classified as: _____

a) Simple	b) Null
c) Composite	d) All of the these
- 4) If H_0 is true and we reject it is called _____.

a) Type - I error	b) standard error
c) Type - II error	d) sampling error
- 5) Find the average of 8, 12, 13, 15, 22.

a) 15	b) 12
c) 16	d) 14
- 6) The median of a series of numerical value is: _____

a) Equal to the average	b) A frequency table
c) A graph or chart	d) A number
- 7) What is the correct relation between variance (V) and standard deviation (SD)?

a) $SD = (V)^2$	b) $V = SD$
c) $V = (SD)^2$	d) $V = \frac{1}{SD}$
- 8) The degree of peakedness is called _____.

a) Kurtosis	b) symmetry
c) skewness	d) dispersion
- 9) If mean and mode of same data are 4 & 10 respectively, its median will be: _____

a) 1.5	b) 16
c) 5.3	d) 6

- 10) By which another 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

B) Write True/ False. 06

- 1) A sample is the small collection of the population selected with the objective to show or tell properties of the concerned population.
- 2) The harmonic mean of a set of observations is the reciprocal of the arithmetic mean of the reciprocals of the observations.
- 3) Mutually exclusive events that, two events can happen together.
- 4) Bar diagram is a graph on which the data are represented in the form of bars.
- 5) Class mark is the last value of a class.
- 6) Measures of skewness tell us whether the dispersion of items from and average is symmetrical or asymmetrical.

Q.2 Answer the following. 16

- a) Write note on pictogram.
- b) Define multistage sampling with example.
- c) What is probability? Explain with example.
- d) Write short note on tabular presentation.

Q.3 Answer the following. 08

- a) Write an account on primary and secondary data with example. 08
- b) Explain sample & sampling? Describe merits of it. 08

Q.4 Answer the following. 08

- a) Prepare ogive curve (less than and more than) graphically for the following frequency distribution. 08

Age groups	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of people	6	12	10	32	22	18	15	5	4	3

- b) Difference between correlation and regression? Add a note on regression analysis and its application. 08

Q.5 Answer the following. 08

- a) Write detailed note on skewness & kurtosis. 08
- b) What are various measures of central tendency? Explain in detail. 08

Q.6 Answer the following. 08

- a) Explain the importance of various statistical techniques in environmental science? 08
- b) Calculate mode & median for the given grouped data. 08

Length in cm	10-20	20-30	30-40	40-50	50-60	60-70
No. of plants	16	10	32	22	20	18

Q.7 Answer the following. 08

- a) Explain null and alternative hypothesis. Write note on t-test. 08
- b) Explain additional rule of probability with example. 08

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M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE

Environmental Virology, Toxicology and Bio-safety (MSC020401)

Day & Date: Thursday, 09-05-2024
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Question No.1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternatives.

10

- 1) Biomonitoring uses living organisms to:
 - a) Clean up environmental pollutants
 - b) Indicate the presence of environmental contamination
 - c) Produce biofuels
 - d) Improve soil fertility
- 2) What is the LD50 (Lethal Dose 50) used for in toxicology?
 - a) To measure the addictive potential of a drug
 - b) To determine the dose of a toxin that is lethal to 50% of a test population
 - c) To assess the mutagenic potential of a chemical
 - d) To identify the specific mechanism of action of a toxin
- 3) Which of the following is an example of a vector-borne disease?

a) Food poisoning	b) Malaria
c) Common cold	d) Tetanus
- 4) What is the purpose of a Material Safety Data Sheet (MSDS)?
 - a) To provide instructions for using a product safely
 - b) To advertise the benefits of a product
 - c) To compare the price of a product with similar products
 - d) To dispose of a product after use
- 5) Which type of personal protective equipment (PPE) is important to wear when handling hazardous chemicals?

a) Safety glasses	b) Cotton gloves
c) Open-toed shoes	d) Jewelry
- 6) What is the difference between a disinfectant and an antiseptic?
 - a) Disinfectants are used on living tissue, while antiseptics are used on inanimate objects.
 - b) Disinfectants are more effective against viruses, while antiseptics are more effective against bacteria.
 - c) Antiseptics are stronger and can cause tissue damage, while disinfectants are milder.
 - d) There is no difference; they are synonymous terms
- 7) When designing a vaccine, what is a crucial factor to consider?
 - a) The taste and texture of the vaccine formulation.
 - b) The ability of the vaccine to stimulate a protective immune response.
 - c) The cost-effectiveness of large-scale vaccine production.
 - d) The color and packaging of the vaccine for consumer appeal.

- 8) Public health surveillance is important for:
 - a) Tracking the spread of infectious diseases
 - b) Monitoring the effectiveness of new medications.
 - c) Identifying new trends in fashion and consumer preferences.
 - d) Promoting healthy lifestyle choices among the general population
- 9) In environmental toxicology, what is the difference between acute and chronic toxicity?
 - a) Acute toxicity has a delayed effect, while chronic toxicity has an immediate effect.
 - b) Acute toxicity affects only plants, while chronic toxicity affects only animals.
 - c) Acute toxicity is caused by exposure to a high dose for a short period, while chronic toxicity results from repeated low-dose exposures over time
 - d) Acute toxicity is always more severe than chronic toxicity.
- 10) What is the primary goal of biocontainment in a laboratory setting?
 - a) To maximize air circulation within the laboratory.
 - b) To prevent the accidental release of hazardous biological agents
 - c) To create a comfortable and aesthetically pleasing work environment.
 - d) To dispose of biological waste materials safely.

B) Write true/false. 06

- 1) Inactivated vaccines contain weakened or killed viruses.
- 2) Biodegradation can occur naturally without any human intervention
- 3) A disinfectant-can completely eliminate all microorganisms from a surface
- 4) Bioaccumulation primarily affects larger animals at the top of the food chain due to their longer lifespans.
- 5) Environmental toxicology is only concerned with the direct effects of toxins on living organisms.
- 6) Viruses are living organisms.

Q.2 Answer the following. 16

- a) Explain Principles of biosafety.
- b) Write note on Environmental Toxicology.
- c) Write note on Chronic toxicity.
- d) Describe Code of safe laboratory practices.

Q.3 Answer the following. 08

- a) Bioaccumulation - Describe in detail. 08
- b) Explain Classification of toxic materials. 08

Q.4 Answer the following. 08

- a) Write detail note on GCLP. 08
- b) Write note on Environmental Toxicology. 08

Q.5 Answer the following. 08

- a) Describe Toxicant Effects with reference to Cellular effects. 08
- b) What is Definitive toxicity test? Describe it. 08

Q.6 Answer the following. 08

- a) Explain about integrated toxicity testing method. 08
- b) What are various Safety rules for domestic staff? 08

Q.7 Answer the following.

- a) Briefly explain toxicants and xenobiotics.
- b) Write note on LOEC.

08

08

Seat No.	
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M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE
Environmental policy, Acts, and Environmental Management System
(MSC020402)

Day & Date: Saturday, 11-05-2024
 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos. 1 and. 2 are compulsory.
 2) Attempt any three questions from Q. No. 3 to Q. No. 7
 3) Figure to right indicate full marks.

Q.1 A) Choose correct alternative among the following. 10

- 1) Which agreement aims to protect the ozone layer by phasing out the production of substances that?
 - a) Stockholm Conference on Human Environment
 - b) Montreal Protocol
 - c) Kyoto Protocol
 - d) Earth Summit at Rio de Janeiro
- 2) Which environmental movement is known to prevent deforestation through the act of hugging trees?
 - a) Chipko movement
 - b) Tehri dam protest
 - c) Sardar Sarovar agitation
 - d) Silent Valley protest
- 3) Which international conference focused on addressing climate change, biodiversity loss, and sustainable development?
 - a) Stockholm Conference (UNCHE)
 - b) UN Conference on Environment and Development. Rio (UNCED) Summit
 - c) Population Conference, Cairo
 - d) Climatic Change Conference, Kyoto
- 4) Which organization is known for its Red List of Threatened Species?
 - a) International Union for Conservation of Nature and Natural Resources
 - b) UN Environmental Programmers
 - c) World Wide Fund for Nature
 - d) National Green Tribunal
- 5) Which environmental treaty aims to protect the ozone?
 - a) Stockholm Conference
 - b) Montreal Protocol
 - c) Population Conference, Cairo
 - d) Climatic change conference, Kyoto
- 6) What is the primary role of the National Green Tribunal in India?
 - a) Enforcing international environmental treaties
 - b) Resolving disputes related to environmental issues
 - c) Advising the government on wildlife conservation
 - d) Implementing population control measures

- 7) Which authority has jurisdiction over environmental matters and issue orders for environmental protection?
 - a) Trial court
 - b) National Green Tribunal
 - c) High Court
 - d) Supreme Court
- 8) Which method involves collecting and analysing data related to environmental parameters for environmental quality?
 - a) Environmental Modelling
 - b) Ethics and Environment
 - c) Environmental Monitoring
 - d) Principles of Environmental Management
- 9) Which concept emphasizes the needs and interests of both present and future generations?
 - a) Intra-generational Equity
 - b) Precautionary Principle
 - c) Intergenerational Equity
 - d) Public Trust Doctrine
- 10) Which tool is utilized for mapping and analysing environmental data, for spatial analysis and decision-making?
 - a) Principles of Environmental Management
 - b) Application of Remote Sensing and GIS
 - c) Environmental Monitoring
 - d) Ethics and Environment

B) Fill in the blanks.

06

- 1) _____ on Wetlands, aims to protect and conserve wetlands of international importance.
- 2) _____ regulates the transboundary movement of hazardous waste and its disposal.
- 3) _____ Protocol, aimed to reduce greenhouse gas emissions to combat climate change.
- 4) Rotterdam Convention aims to promote shared responsibility and cooperation in the international trade of _____.
- 5) _____ is a specialized judicial body in India for effective and expeditious disposal of environmental cases.
- 6) _____ Act, aim to regulate industrial activities to prevent pollution and ensure worker safety.

Q.2 Answer the following.

16

- a) Discuss the significance of the National Forest Policy, 1989, in relation with sustainable forest management.
- b) Analyse the constitutional provisions regarding environmental protection, focusing on Article 48 A and Article 51 A (g).
- c) Explain the objectives and future directions outlined in the National Water Policy.
- d) Discuss the objectives and outcomes of the Earth Summit at Rio de Janeiro, 1992.

Q.3 Answer the following.

- a) Discuss the role of environmental movements in shaping environmental policies and raising awareness about conservation in India. **08**
- b) Evaluate the effectiveness of Johannesburg Conference, 2002 in addressing global environmental challenges. **08**

- Q.4 Answer the following.**
- a) Discuss the outcomes and significance of the Stockholm Conference (UNCHE), 1972 **08**
 - b) Examine the roles and contributions of the IUCN, UNEP, and WWF in global environmental conservation efforts. **08**
- Q.5 Answer the following.**
- a) Evaluate the effectiveness of the Water (Prevention and Control of Pollution) Act, 1974 in addressing water pollution challenges. **08**
 - b) Discuss the key provisions and objectives of Air (Prevention and Control of Pollution) Act, 1981 in India. **08**
- Q.6 Answer the following.**
- a) Explain the concept and importance of environmental monitoring highlighting the key parameters and methods used in monitoring. **08**
 - b) Discuss the role of environmental modelling in environmental management, in relation with its utility in predicting impacts and decision-making. **08**
- Q.7 Answer the following.**
- a) Discuss the challenges and opportunities faced by India in meeting its climate commitments and sustainable development goals. **08**
 - b) Evaluate applications of Intergenerational and Intra-Generational Equity, Polluter Pays Principle, Precautionary Principle, Public Trust Doctrine in shaping environmental regulations. **08**

Seat No.	
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M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2024
ENVIRONMENTAL SCIENCE
Environmental Impact Assessment and Environmental Audit
(MSC020403)

Day & Date: Tuesday, 14-05-2024
 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Question no. 1 and 2 are compulsory.
 2) Attempt any three questions from Q. No. 3 to Q. No. 7.
 3) Figure to right indicate full marks.

Q.1 A) Choose correct alternative.

10

- 1) The Govt. of India approved the Environmental Impact Assessment (EiA) clearance on:

a) 26 Jan. 1996	b) 03 April 1998
c) 27 Jan. 1994	d) 31 March 1998
- 2) "An audit of the purchasing department against ISO 14001" would best be described as which of the following audit types?

a) Due diligence audit	b) Activity audit
c) Third party audit	d) Legal compliance audit
- 3) A local authority decides to develop housing on land that was formerly occupied by a steel works. Identify the correct time frame of the risk assessment process.
 - a) Current and future activities
 - b) Past and current activities
 - c) Past, current and future activities
 - d) Past and future activities
- 4) BIS Stands for _____.
 - a) Bureau of Indian Standards
 - b) Bureau of Investigation of Soil
 - c) Bureau of Information Survey
 - d) None of the above
- 5) The areas up to the 100 meters around the premises such as hospitals, educational institutions and courts are _____.

a) Silence Zones	b) Atrophic Zones
c) EMP Zones	d) Irrigation Zones
- 6) In Environmental assessment study, interpretation and evaluation should consider _____.
 - a) Uncertainty of possible impacts
 - b) Significance of measured impacts
 - c) Comparison of compulsions
 - d) Option a and b
- 7) Who are responsible for the public consultation process of EIA?
 - a) State Pollution Control Board
 - b) State Pollution Control Board and District Collector
 - c) State Pollution Control Board and CPCB Chairman
 - d) State Pollution Control Board and Civil Society

- 8) NABET stands for _____.
 - a) National Accreditation Board for Education and Training
 - b) National Accreditation Board for Environment and Training
 - c) National Assessment Board for Education and Training
 - d) National Accreditation Board for Education and Testing
- 9) Strategic Environmental Assessment (SEA) preferred for _____.
 - a) Mining Projects
 - b) Developmental Projects
 - c) Policies, plans, and programs
 - d) Impact on socio-economic environment
- 10) The impacts caused by construction of dams and reservoirs include _____.

a) soil erosion	b) loss of vegetation cover
c) changes in microclimate	d) All of the above

B) Write True / False. 06

- 1) EIA is including mechanism for monitoring, auditing and evaluation. (TRUE / FALSE)
- 2) Screening criteria based on partial devolvement. (TRUE / FALSE)
- 3) Prediction is scientific data and technical knowledge. (TRUE / FALSE)
- 4) Lead agency decision on whether issue permit approved or the project. (TRUE / FALSE)
- 5) EIA is social and benefit environmental impacts. (TRUE / FALSE)
- 6) Environmental attributes is evident that order to identify assess and predict the environmental impacts. (TRUE / FALSE)

Q.2 Answer the following. 16

- a) Write brief on Environmental impact statement?
- b) Explain NEPA?
- c) What is Environmental inventory?
- d) What is scope and objectives of EIA?

Q.3 Answer the following.

- a) Explain procedure to review report of Environmental Impact assessment? 08
- b) What is EIA and EIS? Explain EIA guidelines 1994 notification Govt. of India? 08

Q.4 Answer the following.

- a) Explain applicability and objective of environmental audit? 08
- b) What is NABET? Explain functional areas and procedure of accreditation? 08

Q.5 Answer the following.

- a) What is checklist? Elaborate types and examples of checklist method? 08
- b) What do you understand about overlay? How it is useful in the EIA? 08

Q.6 Answer the following.

- a) What is carrying capacity? Explain linkage between development and environment in EIA studies? 08
- b) Write note on developmental projects Category B state level appraisal? 08

Q.7 Answer the following.

- a) Elaborate Category A national level appraisal projects for the EIA studies? 08
- b) What is ISO? Give in brief role of environmental audit in sustainable development? 08