PG Even Semester Exam, 2023

Ecology & Environmental Science

4th Semester

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

COURSE NO. ECGCC-403(B)

[Environmental Monitoring & Management]

Answer five questions, taking one from each Unit

UNIT-I

1. What is smelting? How smelting affect our environment? Mention briefly the different bio monitoring techniques used to identify the effect of smelting in our environment. 2+6+6=14

2. Write short note on: 7x2=14
   a. Bioindicators of metal pollution in aquatic systems
   b. Biomonitoring of air pollution

UNIT-II

3. What do you mean by toxicity? Describe briefly the concept of acute, sub lethal and chronic toxicity. 2+12=14

4. Write short notes on the following: 7x2=14
   a. Pesticides in aquatic ecosystem and its harmful effects
   b. Pathogenic contamination of water and health hazard

UNIT-III

5. What do you mean by endocrine disrupting chemicals (EDCs)? Mention the various sources of EDCs. Describe briefly the various harmful effects of EDCs. Mention briefly the various ways by which we can avoid EDCs. 2+2+6+4=14
6. Write short notes on: 7x2=14
   a. Electromagnetic radiation
   b. Toxicogenomics

UNIT-IV

7. What are the different types of ground water sources? Describe briefly the various issues related to ground water. Discuss the different ways of management of ground water resources. 4+5+5=14
8. Write short notes on the following: 7x2=14
   a. Organic farming
   b. Constructed wetland

UNIT-V

9. What is 'ecosystem service'? Mention the different types of ecosystem services with suitable examples. Why valuation of ecosystem

service is important. Discuss briefly citing at least two examples highlighting the application of ecosystem service studies in management of our ecosystems. 2+4+2+6=14

10. Write short notes on: 7x2=14

    a. Ecological footprint

    b. Animal welfare and ethics.

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COURSE NO. ECGCC-403(C)

[Forest and Agricultural Biodiversity]

Answer five questions, taking one from each Unit

UNIT-I

1. State the ecological characteristics of secondary forests. Mention the different typologies of secondary forests and elaborate on the different factors that cause it. State the difference between secondary and primary forests.2+10+2=14

2. Write short notes on: 7x2=14
   a. Biological attributes associated with invasive plant species.
   b. Impact of climate change on forest biodiversity.

UNIT-II

3. Define carbon credits. How do carbon credits work? Describe the benefits of carbon credits. 3+5+6=14

4. Describe the significance of agroforestry in climate change adaptation and mitigation. 14

UNIT-III

5. Specify the difference components of agro biodiversity. Provide an account on the various dimensions of agrobiodiversity. Describe the

UNIT-III

5. Explain the approach of estimation of Biological Richness with appropriate flow charts. 14

6. Write short notes on: 7x2=14
   a. Sensors used in forest studies
   b. Any two applications of RS &GIS in forestry

UNIT-IV

7. What is a natural disaster? How is it different from a natural hazard? Discuss the various techniques of studying disasters using optical remote sensing methods. 2+1+11=14

8. Write short notes on: 7x2=14
   a. SAR and LIDAR to study earthquakes
   b. National database for emergency management

UNIT-V

9. What do you understand by urban sprawl? Discus the causes and consequences of urban sprawl. Explain the use of Shannon's entropy in urban sprawl mapping. 2+6+6=14

10. Write short notes on: 7x2=14
    a. Smart cities
    b. GIS and Urban Planning

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COURSE NO. ECGCC-403(H)

[Remote sensing & GIS Technology & Applications]

Answer five questions, taking one from each Unit

UNIT-I

1. Describe with examples the platforms and sensors used in Aerial Remote Sensing. Add a note on the advantages and disadvantages of aerial remote sensing. 10+4=14
2. Write short note on: 7x2=14
   a. Thermal remote sensing for plant ecology across spatial and temporal scales
   b. Microwave remote sensing and its applications

UNIT-II

3. What are data products? Describe the process of transfer of satellite data to creation of data products with the help of appropriate diagrams. 2+12=14
4. Write short notes on the following: 7x2=14
   a. Image enhancement techniques
   b. Orbit, Swath, Path / Row of satellite and DN value of imageries

nature of agrobiodiversity in India and highlight the factors responsible for its loss. 2+5+7=14

6. Write short notes on: 7x2=14
   a. Important Agricultural Heritage Systems in India
   b. In situ on farm conservation

UNIT-IV

7. Define remote sensing and GIS. Describe the utility of remote sensing and GIS in forestry and ecology. 3+11=14
8. Briefly write about three widely used image classification methods. What are the basic requirements of forest change detection using satellite images? 5+9=14

UNIT-V

9. Describe the importance of agrobiodiversity conservation in advancing food security. 14
10. Write short notes on: 7x2=14
    a. International Code of Botanical Nomenclature
    b. Importance of people's biodiversity registers in the preservation of traditional knowledge

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COURSE NO. ECGCC-403(E)

[Algal Ecology and Physiology]

Answer five questions, taking one from each Unit

UNIT-I

1. Explain symbiosis? Discuss how algal symbiosis is operative in lichen and *Azolla*. 4+10=14
2. Write short notes on: 7x2=14
   a. Extracellular products in algae
   b. Pigment composition in cyanobacteria

UNIT-II

3. What are the various physico-chemical factors which influence the growth of algae. Narrate the effect on temperature and pH on algal growth. 4+10=14
4. Write short notes on: 7x2=14
   a. Sun-shade adaptation
   b. High rate algal ponds

UNIT-III

5. Briefly discuss chemical stress in a freshwater ecosystem. Illustrate on the mode of adaption in algae in relation to heavy metal stress. 4+10=14

   b. Cross culture enthnobotanical study

UNIT-IV

7. Write down the scientific name and family of Sarpagandha. Describe agropractice and commercial cultivation of Sarpagandha & mention its uses. 1+9+4=14
8. Write notes on: 7x2=14
   a. Secondary metabolites
   b. Non-timer forest products

UNIT-V

9. Define conservation. Write down the principle & practices of medicinal plants conservation. Write in details about the Livelihood of tribals vis-à-vis forest management. 1+3+10=14
10. Write short notes on: 7x2=14
    a. In-situ conservation
    b. Traditional ethics toward the conservation of medicinal plants.

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COURSE NO. ECGCC-403(G)

[Ethnobotany & Conservation of Medicinal Plants]

Answer five questions, taking one from each Unit

UNIT-I

1. What is ethno pharmacology? Describe the role of ethno botany in human welfare. 1+13=14

2. Write short note on the following: 7x2=14
   a. Dynamism in ethnobotany
   b. Indian's contribution to ethnobotanical studies

UNIT-II

3. What are the sources of ethnobotanical materials? Write in detail about the objectives of ethnobotanical study 6+8=14

4. Write short notes on the following: 7x2=14
   a. Traditional Botanical knowledge
   b. Importance of Herbaria in ethnobotanical studies

UNIT-III

5. What is Biopiracy? Write in details about the traditional knowledge Digital Library (TKDL). 1+13=14

6. Write short notes on: 7x2=14
   a. Intellectual Property Rights

6. Write short notes on: 7x2=14
   a. Algal Biomonitoring
   b. Algal toxins

UNIT-IV

7. Discuss the light harvesting complex (LHC) in algae. Elaborate on the mode of ETC in photosystems in algae. 7+7=14

8. Write short notes on: 7x2=14
   a. Nitrogenase complex in heterocyst
   b. Role of phosphorus nutrient in algal growth

UNIT-V

9. What are the economic importance of algae? Name four algal species used as bio fertilizers. 10+4=14

10. Write short notes on: 7x2=14
    a. Role of algae in ecorestoration
    b. Immobilization of algae and its applications

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COURSE NO. ECGCC-403(F)

[Wildlife Conservation Ecology]

Answer five questions, taking one from each Unit

UNIT-I

1. Mention in brief the Ecological role played by wetland as the habitat of variety of wildlife. Write about the ecological features and faunal characteristics of any two important wetlands of north east India. 6+4+4=14

2. Write short note on: 7x2=14
   a. Canopy gap dynamics & their impact on wildlife
   b. Umbrella species

UNIT-II

3. Write an account on the various mechanisms involved in the migration of birds. 14

4. Write in detail the point transect method used in bird census. Write a sample data sheet used for bird census. 8+6=14

UNIT-III

5. What do you mean by Man-animal conflict? Explain the man-animal conflict in the light of human population explosion. Suggest some measures for its mitigation. 3+8+3=14

6. Write short notes on: 7x2=14
   a. Penal provisions against crimes on wildlife as per the Wildlife (Protection) Act, 1972.
   b. Census technique of Rhinoceros and the present status of Rhinoceros in India.

UNIT-IV

7. Write an account on the role of Zoos and Aquarium in the conservation of wildlife. 14

8. Write notes on: 7x2=14
   a. Population of Tiger in India as per 2022 census
   b. Project Tiger

UNIT-V

9. Write an account on the Principles and Strategies of Wildlife Management in India. 14

10. Write short notes on: 7x2=14
    a. Role of Indian NGOs in wildlife conservation.
    b. Impact of climate change on wildlife.

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