M.Sc. Examination 2024

Sem-III

Environmental Science

Course: MEC 32
(Ecology)

Time: 3 Hours **Full Marks: 40**

Questions are of value as indicated in the margin.

Answer ***Question No.1*** and ***<u>any four</u>*** from the rest

1. Write short notes on **any four** of the following 2×4 = 8
   a. Carrying capacity
   b. Autogenic and allogenic succession
   c. Hybrid sterility
   d. Homeorhesis
   e. Genepool
   f. Secondary production

2. a) What is speciation? 2+(2+2+2) = 8
   b) How can a new species form through allopatric, parapatric, and sympatric speciation?

3. a) What are the problems faced by agro-ecosystems at present?
   b) Discuss how can one overcome the problems by adopting lower input sustainable agriculture. Explain by providing suitable diagrams 3+5 = 8

4. Write short notes on the following: 4+4 = 8
   a. Phsphorus cycles
   b. Y- shape model of energy flow

5. Explain 'J' and 'S' shape population growth curve. 4+4 = 8

6. Write brief notes on the following: 4+4 =8
   a. Classical approach of ecological succession
   b. Lotka-Volterra model

7. a) Briefly describe Liebig's law of minimum and Blackman's law of limiting factor.
   b) Discuss Shelford's law of tolerance. (2.5+2.5)+3 = 8

M.Sc. Examination 2024

Sem-III
Environmental Science

Course: MEC 33
(Environmental Toxicology)

Time: 3 Hours **Full Marks: 40**

Questions are of value as indicated in the margin.

Answer **Question No.1** and **any four** from the rest

1. Write short notes on any four: 2×4 = 8

   (a) Toxicodynamics

   (b) Toxins & Toxicants

   (c) ID_{50}

   (d) EDC

   (e) Grasshopper effect

   (f) K_{OW} and K_{OC}

2. Explain the processes of absorption and excretion of a toxicant. How Phase I and Phase II enzymes help in biotransformation of chemicals? 3+5=8

3. What is therapeutic index? Define oxidative stress. Give some examples of detoxifying enzymes. How is additive effect differentiated from potentiation? 2+2+1+3= 8

4. What is Forensic toxicology? What can be the sources of samples for a toxicological death investigation in forensic toxicology? What are the analytic techniques involved in forensic toxicology? Define acute and subchronic toxicity. 1+2.5+2.5+2=8

5. Explain the toxic mechanism and effects of cadmium on kidney and bone.

   (2.5+2.5) + (1.5+1.5) =8

6. a) What is graded and quantal dose-response?
   b) Discuss the physico chemical and pollution biology of organic pollutants on a river?

   (1+1) +3+3) =8

7. Explain the toxicity of asbestos with special reference to occupational health. Give a note on silicosis. 5+3=8

M.Sc. Examination 2024
Sem-III
Environmental Science
Course: MEC-34
(Remote Sensing and GIS)

Time: 3 hours **Full Marks: 40**

Questions are of value as indicated in the margin.
Answer **question No.1** and **any four** from the rest.

1. Write short notes on **any four** of the following. 2 × 4 = 8

   a) Stereoscopic vision
   b) Absorption bands
   c) Active sensor
   d) Raster data model
   e) Precision agriculture
   f) Kinetic and Radiant temperature

2. a) Define 'remote sensing'? Discuss the advantages and limitations of satellite based remote sensing.
   b) Discuss the steps involved in remote sensing technique. What are the ideal conditions for remote sensing? (1+2+1) +(3+1) = 8

3. a) What do you mean by remote sensing data? Explain the different data formats used to store remote sensing data.
   b) Discuss the different types of resolutions used in remote sensing data with examples. (2+2) +4 = 8

4. a) How aerial photographs are taken? How the scale of an aerial photograph can be determined?
   b) Describe the system parameter and terrain parameters of radar image.
   (2+2) + (2+2) = 8

5. a) What are Radiometric and Geometric corrections?
   b) Discuss the differences between the supervised and unsupervised method of image classification. (2+2) + (2+2) = 8

6. What are the key components of disaster management? Discuss the role of Geospatial technology in natural disaster management. 2 + 6 = 8

7. a) Distinguish between sun-synchronous and geo-synchronous satellites.

   b)What are GNSS (Global Navigation Satellite Systems) and what are their utilities?
   4 + (2+2) = *8*

M.Sc. Examination, 2024
Semester-III
Environmental Science
Course: MEC-35
(Environmental Economics and Sustainable Development)

Time: 3 Hours **Full Marks: 40**

Question are of value as indicated in the margin

Answer question No. **1** and a**ny four** from the rest.

1. Write short notes on **any four** of the following 2x4=8
   (a) Budget line
   (b) Edgeworth box
   (c) Environmental Kuznet curve
   (d) Market failure
   (e) Law of demand
   (f) Marshallian consumer surplus
2. What is Pareto optimality? How does the concept of Pareto optimality criterion apply in the context of environmental economics? 2+6=8
3. What is an externality in economic terms? How the Coase Theorem is applied to a situation of pollution between two parties? 2+6=8
4. Illustrate the stages of Cost Benefit analysis? Find out the optimum pollution point through pollution damage and control curve. 4+4=8
5. Discuss the scope and significance of environmental economics. What is the role of government policy in addressing environmental issues? (2+2)+4=8
6. Define indifference curve. What is the relationship between budget constraints and indifference curves in determining consumer equilibrium? Illustrate the law of Diminishing marginal utility with example. 2+2+4=8
7. What is the difference between private and social costs in environmental economics? How do externalities associate with industrial output? 4+4=8
