SL No of QP 10032

# University of Delhi

## B.Sc.(H), NEP Theory Examinations, 2025

**Semester: VII**

**Subject: Environmental Geology** **Maximum Marks: 90**

**Paper code: 2193010015** **Time Duration: 3 hrs.**

*Note: Attempt any five questions. All questions carry equal marks.*

**Q.1**

**(a)** Analyse the interconnected impacts of large-scale deforestation on the lithosphere, hydrosphere, and atmosphere, with specific emphasis on the feedback loops involved. **(12 Marks)**

**(b) Using a specific example, demonstrate that the functional role of a species is often more critical to ecological integrity than its relative abundance. (6 Marks)**

**Q.2**

**(a)** Discuss the relevance of the 'Public trust Doctrine' for the protection of critical geological features like aquifers and river systems from irreversible degradation. **(12 Marks)**

**(b)** Explain the precautionary principle with an example and citing the judgment. **(6 Marks)**

**Q.3**

**(a)** Explain the main causes of floods. How do catchment characteristics and land use changes influence flooding?

**(b)** Differentiate between earthquake magnitude and intensity.

**(c)** What is a landslide? Discuss the major techniques of slope stabilisation.

**(6X3= 18 Marks)**

**Q.4**

**(a) Differentiate between slow and fast geologic processes and explain their role in shaping Earth's surface. (9 Marks)**

**(b) Briefly describe the main objective of calculating a WQI. What is the fundamental limitation of using a single index value to represent overall water quality? The weighted arithmetic mean method is a common approach for WQI calculation.**

**i) What is the purpose of assigning a 'weight' ($w_i$) to each water quality parameter?**

**ii) The formula for the unit weight is often given as $w_i = K / S_i$, where $S_i$ is the standard permissible value. What is the role of the constant 'K'?**

**(9 Marks)**

**Q.5** Write short notes on *any six* of the following

**(a)** Gaia hypotheses
**(b)** Geological substrate of catchment and flood response
**(c)** Desertification
**(d)** Cyclone
**(e)** Biological Oxygen Demand
**(f)** Particulate Matter
**(g)** Neotectonics
**(h)** Environmental Impact Assessment **(6X 3 = 18 Marks)**

**Q.6**

**(a) Differentiate between *primary* (natural) and *secondary* (anthropogenic) salinization, providing a cause for each. Also, explain the specific mechanism of how irrigation in dry areas, without proper drainage, leads to the accumulation of salts in the root zone. Describe two sustainable land management practices that can be used to prevent or reverse soil salinization.**

**(9 Marks)**

**(b) Describe the visual characteristics of a fanning plume and explain the atmospheric conditions during a strong inversion that cause the plume to take this specific shape.**

**(5 Marks)**

**(c) Provide a contrast of the fanning plume with a looping plume. Which of these two plume types would result in higher short-term ground-level concentrations downwind of the stack, and why?**

**(4 Marks)**

**Q.7** Describe soil pollution with respect to the movement of contaminants in the vertical soil layer. Explain the difference between Coffer dam and surface insulation system. List the advantages and disadvantages of both. **(18 Marks)**

**Q.8 What are the key observable indicators identified by IPCC as evidence for global climate change? Explain major human activities that are the primary drivers of this change, and** propose widely applicable strategies to mitigate (reduce) the impacts of climate change. **(18 Marks)**