

GUIDANCE IAS

GEOGRAPHY OPTIONAL

PRINTED NOTES

2023-24

ENGLISH MEDIUM

**PREVIOUS YEARS QUESTIONS****PAPER- I****GEOMORPHOLOGY**

1. Discuss the views of W.M. Davis and Walther Penck on the cycle of erosion. (86/1/3/60)
2. Discuss the evolution and characteristics of the landforms of graded regions. (87/1/5/60)
3. Write short note on Karst landforms in about 200 words. (88/1/2/20)
4. Critically analyse the concept of plate tectonics and bring out the evidences to support it. (88/1/5/60)
5. Write short note on rejuvenated landforms in about 200 words. (89/1/2a/20)
6. Write short note on Plate tectonics in about 200 words. (90/1/2a/20)
7. Analyse the differences in the models of slope evolution proposed by Davis and Penck. (90/1/3/60)
8. Write short note: Polycyclic landforms. (91/1/2(a)/20)
9. Analyse the sequential development of landforms in either Karst or Coastal region. (91/1/3/60)
10. Write short note : Classification of Earth Movements. (92/1/2(a)/20)
11. Explain the factors causing rejuvenation in landscape and describe the resultant landforms. (92/1/3/60)
12. Write short note: Treppen concept. (93/1/2(a)/20)
13. Discuss, with examples, the influence of vulcanism and diastrophism on the evolution of landscape. (93/1/3/60)
14. Discuss the concept of cycle of erosion and bring out clearly the difference between the views of Davis and Penck. (94/1/3/60)
15. Discuss the limitations of the theory of Continental Drift and show how the theory of Plate Tectonics is an improvement over it (95/1/3/60)
16. Discuss the processes of mechanical and chemical weathering and show their relationship with soil formation. (96/1/3/60)
17. Write short note : Weathering and soil formation (97/1/2(c)/20)
18. Discuss the concept of polycyclic landforms and present an analytical study of the polycyclic landforms of a selected region. (97/1/3/60)
19. Write short note: Geomorphic processes (98/1/2(b)/20)
20. Discuss the concept of volcanicity and show how the theory of Plate Tectonics explains the mechanism of volcanism and volcanic eruptions. (98/1/3/60)
21. Bring out the distinctions between the 'continental drift' theory and the 'plate tectonics' theory. (99/1/3/60)
22. With reference to the theory of Plate Tectonics, explain the origin and growth of the Young Fold Mountain Systems of the world. (00/1/2/60)
23. Present a critical analysis of the theory of Isostasy. (01/1/2/60)
24. Provide a critique of the 'geographical cycle' model, propounded by Davis. (02/1/2/60)
25. Write short note: Geosyncline (02/1/5(a)/20)
26. Explain the sequential development of landforms associated with the coastal (03/1/2/60)
27. Describe the landforms which are products of endogenetic forces. (04/1/2/60)
28. Write short note: Peneplain (04/1/5(a)/20)
29. "Structure is a dominant control factor in the evolution of landforms." Discuss with suitable examples. (05/1/2/60)
30. Write short note : Role of seismic waves in the study of earth's interior (05/1/5(a)/20)



LECTURE - 1 OCEANOGRAPHY

BOTTOM TOPOGRAPHY OF OCEANS:

Bathymetry Techniques –

- These are used to ascertain the depth of oceans.

(1) Direct Method –

- Way of ascertaining depth by physical means such as by lowering of rope/chains or by divers.

Limitations:

- Gives an idea only up to limited depths.
- Only very limited part of the ocean can be mapped.
- With depth, pressure increases thousand times, therefore need of sophisticated instruments to withstand this pressure,
- Sea water is corrosive in nature (may cause short circuits, fouled by marine organisms.

(2) SONAR Technology

- Sound waves are sent to the ocean floor which are reflected back after hitting the floor. Total distance travelled by them is calculated from the travel time of these sound waves. Thus, theoretical depth can be ascertained ($\text{Depth} = \frac{\text{Total distance travelled}}{2}$).

Limitations:

- limited part of ocean can be mapped (later multi beam sonar was used, however, it could just increase the area covered but could not eliminate other problems: as sound waves disturb marine ecology etc.)

(3) Satellite Imagery –

- Gravity attracts water towards the regions occupied by massive features. Thus, the mountains and the ridges produce elevated areas on the ocean surface while the trenches and the deeps cause slight depression in the ocean surface. These differences over sea surface can be mapped over satellite imagery. This method is advantageous as large parts of oceans can be mapped without having any impact on the ocean ecosystem. Thus, it has emerged as the most important technique of bathymetry. The only disadvantage is that it excludes the role of oceanic movement which causes differences over sea/ocean surface.

MAJOR FEATURES OF BOTTOM TOPOGRAPHY OF OCEANS

(I) CONTINENTAL SHELVES:

- These are gently sloping submerged surface of the continents extending seaward from the shoreline. It is found up to 100 fathoms and covers 8.6% of total oceanic area.



#1 BIOGEOGRAPHY Lecture Hand-out:

Taxonomical order:

Life > Domain > Kingdom > Phylum > Class > Order > Family > Genus > Species.

A.R. Wallace classified the subject matter of biogeography along 2 lines:

a) Geographical biology: studies the space related properties of plants and animals, particularly the regularities of distribution. It is a systematic study. Here we focus on factors affecting distribution and study of biomes.

b) Biological Geography: it divides the earth's surface into geographical units based on similarities and differences, in the occurrence of species, higher systematic Taxa and Ecosystems. Here basic task is Areal differentiation i.e. making biogeographic regions: Floristic regions, faunistic regions, biotic regions (by UNEP) (for conservation of species).

BASICS:

Habitat: is a place where individual species and population both marine and terrestrial tend to live. There can be Macro habitat, Meso habitat, and Micro habitat.

Patches: are fairly homogenous areas that differ from their surroundings. Ex: - small field, Woods.

Corridor: is a strip of land that differs from land to either side. Corridors connect patches.

Diagram:

Background matrix: means background ecosystems in which patches and corridors are set.

Ecological Niche: Address and Profession i.e. optimum habitat for growth of species.

A. Systematic Biogeography:

Factors controlling distribution of plants and animals.

I. ENVIRONMENTAL FACTORS: it behaves as a limiting factor in the distribution of species.

Limiting factors slow down the growth of the population of species.

2 LAWS:

a) Law of minimum: [Given by J.V. Leibig]: It means that there is a minimum limit required for growth & reproduction of organisms with respect to environmental factors which behave as resources.

b) Law of Maximum: where population growth is curtailed by an environmental factor conceding an upper limiting level.

**1****THE DEVELOPMENT & TRENDS IN GEOMORPHOLOGY****DEFINITIONS**

If we defined geomorphology in terms of the three Greek roots from which the word was derived, it would mean a discourse on earth forms. Generally, it is thought of as "the science of land forms" and it will be so used, although we shall extend it to include submarine forms. Although widespread use of the term geomorphology has come about within the past few decades, it appears that the term was used in its present sense by Keith as long ago as 1894.

Designation of the study of land forms as geomorphology has come about as a result of dissatisfaction with the term physiography, which was formerly applied to this subject. Physiography, particularly as used in Europe, includes considerable climatology, meteorology, oceanography, and mathematical geography.

Geomorphology is primarily geology, despite the fact that some geomorphology is taught both in Europe as a part of physical geography. In most geography courses landforms are treated rather incidentally as a part of the discussion of the physical environment of man, but emphasis usually is placed upon man's adjustments to and uses of landforms rather than upon landforms per se.

THE DEVELOPMENT OF MODERN GEOMORPHIC IDEAS

During the many centuries which followed the decline of the Roman Empire there was little or no scientific thinking in Europe. Such knowledge as survived was largely in monasteries, but it was not natural science. Some survival of learning persisted in Arabia, and we find certain ideas expressed there that have a modern flavor. Avicenna (IbnSina, 980-1037) held views upon the origin of mountains which divided them into two classes, those produced by "uplifting of the ground, such as takes place in earthquakes," and those which result "from the effects of running water and wind in hollowing out valleys in soft rocks." Thus the concept of mountains resulting from differential erosion was expressed. The idea of slow erosion over long periods of time was also held by him.

Apparently paving the way for Avicenna was a work by a group of unknown Arabic scholars known as The Discourses of the Brothers of Purity written sometime between the years 941 and 982 AD (said, 1950). In this four volume work we find reference to what today we would call erosion and transportation by streams and wind, weathering and even the germinal idea of peneplanation.

As Fenneman (1939) has stated, so little progress was made in Europe from the days of the first century AD until the opening of the sixteenth century that little need be said about it. During the fifteenth, sixteenth, and seventeenth centuries landforms were explained largely in terms of the then prevailing philosophy of catastrophism, according to which the features of the earth were either specially created or were the result of violent cataclysms which produced sudden and marked changes in the surface of the earth. As long as the earth's age was measured in a few thousand years, there was not much chance for the importance of slow geologic processes to be appreciated.

HUTTON AND PLAYFAIR

James Hutton (1726- 1797) was born in Edinburgh, Scotland, and was educated as a physician, but his interests were in science, especially chemistry and geology. He is most famous, perhaps, for the role he played as a leader of a group known as the Platonists, which maintained that granite was of igneous origin in opposition to