

7. (i) State the importance of porosity and permeability in sediments and how does it change as the sediments form solid rock? Explain with sketches.
- (ii) Describe the forces that combine to entrain a grain. Draw a picture to explain your answer?
- (iii) With the help of a labeled diagram, describe the different types of particle movement in a stream and explain the following :
1. Movement of bedload
 2. Transport of suspended load and the conditions under which it settles.
 3. Concept of dissolved load and why it is usually not depicted in diagrams.
8. (i) Discuss the factors controlling limestone formation in marine environments, emphasizing the role of carbon dioxide removal from seawater?
- (ii) Explain the classification scheme for carbonate rocks, detailing how it distinguishes between allochemical and s components, and discuss its significance in understanding carbonate rock composition and origin.

(200)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5808

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Unique Paper Code : 2192012302 (DSC 8)

Name of the Paper : Sedimentary Geology

Name of the Course : B.Sc. (H.) Geology (NÉP-UGCF)

Semester : III

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
 2. Attempt any **five** questions.
 3. **All** questions carry equal marks.
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1. (i) Explain how weathering, sedimentation, and recycling of sediments contribute to the evolution of the continental crust.
 - (ii) Explain how variations in relief, temperature, and moisture influence the type and composition of weathering products generated in the arid and humid climate.

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2. (i) Explain the statistical parameters (mean, median, mode, standard deviation, and skewness) in the context of sediment granulometry, and discuss their significance in interpreting sediment characteristics, sorting, transport history, and depositional environments.
- (ii) Discuss the "flow regime concept" considering Reynolds' and Froude numbers.
3. (i) With the help of grain-size classification, discuss major categories of terrigenous sediments and their associated sedimentary rock types.
- (ii) List and briefly describe the methods used to measure grain size in both unconsolidated sediments and consolidated (stratified) rocks.
- (iii) Explain the stages of textural maturity in sandstones and describe the changes in grain characteristics and sorting that occur during each stage.
4. Write a short note on any **three** of the following :
(6×3=18)
 - (a) Influence of climate, relief, and source rock on the characteristics of primary detrital sediments.
 - (b) Relative stability of common rock-forming minerals (Goldich Stability Series).

- (c) Walther's law of facies succession.
- (d) Grain sphericity and roundness and their significance.
- (e) Role of organisms in the precipitation of calcium carbonate.
5. (i) Describe how geologists identify the stratigraphic 'up' direction in a sedimentary sequence, with reference to common bedding plane structures.
- (ii) Describe how directional sedimentary structures can be utilized to infer paleocurrent directions, paleoenvironmental conditions, and the top/bottom orientation of sedimentary layers.
6. Briefly explain (**any three**) : (6×3=18)
 - (i) Relative abundance of major sedimentary rock types.
 - (ii) Diagenetic changes in sedimentary rocks with depth and temperature, including physical, chemical, and mineralogical transformations.
 - (iii) Role of fluid flow in the formation and preservation of sedimentary structures.
 - (iv) Significance of stromatolites in interpreting past environments and early life on Earth.