M. Sc. Applied Geology Examination, 2023

(1st Year, 2nd Semester)

Sedimentology

Paper – CORE/TH/07

Time : Two hours Full Marks : 40

(Use a separate Answer script for each Part.)

Part – I (20 Marks)

Answer ***any four*** questions.

1. a) Why do most carbonate slope deposits have apron rather than fan geometry?

   b) What are the distinctive characteristics of marine cements in limestones?

   c) How do you recognize a Rimmed platform in rock record? 1+2+2=5

2. a) What are the advantages of using sequence stratigraphy in place of lithostratigraphy?

   b) How does the burrow concentration vary during

      i) Rapid rate of sedimentation

      ii) Rapid discontinuous sedimentation

      iii) Slow continuous sedimentation 2+3=5

3. What are the factors that control Relative sea-level rise and fall? Illustrate the range of variations in the Relative Sea Level rise scenario depending on variable interactions between eustatic sea level change and basin uplift/subsidence. 1+4=5

4. What are the major differences between siliciclastic and carbonate depositional system? 5

5. a) How do you define 'Forced regression' and 'Normal regression'?

   b) Discuss the significance of drowning unconformity? Why is it used for carbonate sequence only? 2+3=5

6. Discuss briefly the hypothesis of penecontemporaneous dolomitization. 5

Part – II (20 Marks)

Answer **Q. 1** and ***any three*** questions from the rest.

1. Write down the prerequisite conditions for formation of an estuary. What are the major components of an estuarine depositional system? How can an estuary be identified in a rock record? 2+3+3=8

Or

How and why do aeolian environments differ from their subaqueous counterparts? How do you distinguish

between dry and wet aeolian systems? Define aeolian "Supersurfaces". 4+3+1=8

2. Sediment gravity flows are more common in alluvial fans than a fluvial environment – discuss this observation. 4

3. Why does a river meander? How can one measure the meandering index? 3+1=4

4. Evaluate the role of sediment gravity flows in deep-marine sedimentation. 4

5. Describe the different types of fluvial bars. How are they characterized in rock records? 4

6. How can a wave-dominated shelf be recognized in rock record? How does the sedimentary succession of a wave-dominated shelf differs from a tide-dominated shelf? 4

7. Discuss any ***two*** of the following phenomena : 2+2=4

   a) Adhesion ripples are not ripples in proper sense.

   b) Role of graded profile in defining the stacking pattern of fluvial system.

   c) Uniqueness of the lacustrine environment.