Ex./FG/1/IX/40/2017

BACHELOR OF SCIENCE EXAMINATION, 2017

(Final Year, 6th Semester)

GEOLOGICAL SCIENCES

Paper : IX

Principles of Stratigraphy & Environmental Geology

Time : Two hours Full Marks : 50

Use separate Answer scripts for each group.

GROUP - A (25 marks)

(Principles of Stratigraphy)

Answer ***q.no. 5*** and any ***four*** from the rest.

1. Discuss the Law of Superposition. What are the limitations of this law in interpreting a stratigraphic sequence ?

2. (i) What is the difference between the concepts of Uniformitarianism and catastrophism in stratigraphy ?

   (ii) "There are more gaps than records in Stratigraphic sequence"–Explain. 3+2=5

(Turn Over)

3. What is a Lithostratigraphic unit ? How do you define the basic unit of lithostratigraphic classification ? What are the advantages of lithostratigraphic classification over the chronostrigraphic and biostritigraphic classifications ? 1+2+2=5

4. How do you define "Correlative conformity" ? What is the advantage of considering correlative conformity for delineating a stratigraphic succession ? 2+3=5

5. What is net sedimentation ? How does sediment get preserved in rock record ? How do you interpret coarsenting and fining upward sequences? 1+2+2=5

6. What are the major criteria to distinguish between aeolian and fluvial formations in stratigraphic record ? 5

7. A stratigraphic succession starts with a planar laminated limestone (A) followed upward by cross stratified calcarenite beds (B), which is again overlain by a poorly sorted, coarse grained sandstone (C), A distinct irregular surface observed between the B and C. Interpret the succession. 5

(b) A perennial river is an instance of :
   (i) Closed–Dynamic system
   (ii) Isolated–Dynamic system
   (iii) Open–Dynamic system
   (iv) Flow–Gravity system

(c) The percentage of incoming solar energy reflected back by the upper layers of atmosphere is about–
   (i) 16%
   (ii) 29%
   (iii) 5%
   (iv) 25%

(d) The wavelength of microwaves, is normally absorbed by water vapor in the atmosphere ranges between
   (i) 25–50 μm
   (ii) 50–100 μm
   (iii) 150–200 μm
   (iv) 200–250 μm

(e) Unit of absolute permeability is same as the unit of
   (i) Velocity
   (ii) Length
   (iii) Area
   (iv) Volume

—— X ——

8. Write short notes on (any ***two***) : 2.5x2=5

   (a) Criteria for determining stratigraphic top

   (b) Unocnformity and Diastems

   (c) Index fossils and Long ranging fossils

   (d) Onlap and toplap

GROUP - B (25 marks)

(Environmental Geology)

Answer any ***five*** questions.

9. What is feedback in the environmental system ? What are positive and negative feedbacks ?–Explain with examples. 2+3=5

10. What is 'atmospheric window' ? Present the percentage and growth rates of major greenhouse gases responsible for global warming in a tabular format. 2+3=5

11. What is 'insolation' ? How does it vary with latitude ? What is 'albedo' ? 2+1+2=5

12. Mention the major steps of precipitation ? How does 'orographic cooling' differ from 'cyclonic cooling' ? 2+3=5

13. Present a flow chart showing different interactions of the Earth systems with the pedosphere. What is leaching ? 4+1=5

14. What is 'saline intrusion' ? How does it take place in coastal areas ?–Explain. 2+3=5

15. Write short notes on any ***two*** : 2x2.5=5

   (a) Discharge and seepage velocity through porous media

   (b) Nuclear fission and nuclear fusion

   (c) Natural hazards and natural disaster

16. Choose the correct answer from the following : 1x5=5

   (a) The most dominant constituent element of lithosphere is :

      (i) Magnesium

      (ii) Silicon

      (iii) Iron

      (iv) Oxygen