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)

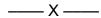
Answer *q.no.* 5 and any *four* from the rest.

- 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

- 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?
- 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.

- (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) $25-50 \mu m$
 - (ii) 50–100 μm
 - (iii) 150-200 μm
 - (iv) 200–250 μ m
- (e) Unit of absolute permeability is same as the unit of
 - (i) Velocity
 - (ii) Length
 - (iii) Area
 - (iv) Volume



- 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

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

(Turn Over)