U.G. 1st Semester Examination - 2023

GEOLOGY

[MAJOR]

Course Code : BGELMAJ01T

Course Title: Earth System Science

[NEP-20]

Full Marks : 75 Time : 3 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **fifteen** questions: 2×15=30

a) Arrange in order of abundance (decreasing) the three most abundant elements of the Earth.

b) What is the distinction between meteorite and asteroid?

c) Define Biozone.

d) What is Plutonism?

e) Name the topmost layer of the soil, which supplies fertility to the soil.

f) What is an Epicentre of an earthquake?

g) What is the estimated time of 'Big Bang'?

h) Define Low Velocity Zone (LVZ).

i) What are Pyroclastic flows?

j) What are Calderas?

k) Define Mohorivicic discontinuity.

l) What do you call the failed arm of a continental rift? Give an example.

m) What kind of plate boundary is associated with deep focus earthquake?

n) When was the last ice age transpired?

o) What causes formation of magnetic stripes in the ocean?

p) What is lithostratigraphy? Name the lithostratigraphic units from smallest to largest.

q) Which radioactive isotope would be most useful to age date a rock from the Archean and why?

r) What is the Airy's hypothesis?

s) Give two examples of Shield volcano.

t) What is Law of Superposition?

u) What do you understand by Coriolis force?

v) Name different types of meteorites and their general composition.

w) Describe, very briefly, nature of Loess.

2. Answer any **five** questions : $5 \times 5 = 25$

a) Briefly describe the formation of oxygen and oceans in the early earth.

b) What is geothermal gradient? Explain with an arbitrary graph. Describe how heat is generated in the interior of the earth.

c) What is Geological time scale? Differentiate between relative and absolute dating. Define Principle of Faunal Succession.

d) Write a short note on the processes of weathering.

e) Prove that for any media, P-waves will always travel faster than S-wave. What is seismic shadow zone?

f) Define isostasy and differentiate between the two theories of isostasy.

g) Describe the main driving forces behind Plate Tectonics.

h) Describe different types of plate boundaries with neat sketches.

3. Answer any **two** questions from the following: $10 \times 2 = 20$

a) Describe four major types of soil. Describe how do climate and topography control soil formation. $4+6=10$

b) Define geochronology. Describe the basic principle of radiometric age dating. Write the names of different methods of radiometric age dating. What are the chronostratigraphic units? Give one example of each type.

1+5+2+2=10

c) Draw a conical section of the Earth and show its layered structure. Name the layers and show the depth of two most prominent discontinuities. Briefly describe its internal structure.

d) Mention the mechanism through which earthquake takes place. Which places are most favourable for an earthquake to take place? Define Tsunami and explain how it is related to earthquake.
