

(4)

Ex/CORE/TH/01/31/2019

BACHELOR OF SCIENCE EXAMINATION, 2019

(1st Year, 1st Semester)

GEOLOGICAL SCIENCES

Earth System Science

Paper - CORE/TH/01

Time : Two hours

Full Marks : 50

Use a separate answer script for each group.

GROUP - A (25 marks)

Answer any *five* questions.

1. “Any theory that cannot, at least possibly, be disproved, is not scientific” – Explain. ‘Space shuttle’ is an example of closed system’ – Justify. Do you consider that geosphere has any role in changing the atmosphere? What is regolith? $2+1+1+1=5$
2. What are the differences between seismic body and surface waves? What is a ‘velocity-depth curve’? What are the differences in relative abundances of elements in whole Earth and in Earth’s crust? $2+1\frac{1}{2}+1\frac{1}{2}=5$

9. Answer any *ten* questions : $1 \times 10 = 10$
- (a) What are allochemical sediments?
 - (b) What are trace fossil?
 - (c) Enumerate different perspectives of relative and actual geologic age dating?
 - (d) How do you define a basin?
 - (e) Name a sedimentary rock which is not a product of weathering.
 - (f) What is unroofing?
 - (g) What is Uniformitarianism?
 - (h) Why is the angle of repose of wet sand higher than that of dry sand?
 - (i) What is outgassing?
 - (j) Why are Archean sedimentary rocks generally dark in colour?
 - (k) How do you distinguish Prokaryotes from Eukaryotes?
 - (l) What are autotrophs and fermenters?
 - (m) How did amino acid formed in early earth?
 - (n) How do you classify sediment load?

— X —

(Turn over)

(2)

3. What is lithosphere? Write the differences between continental lithosphere and oceanic lithosphere. What is geothermal gradient? "Heat reaches the bottom of the lithosphere by convection; it passes through the lithosphere by conduction" – Why? $1+1\frac{1}{2}+1+1\frac{1}{2}=5$
4. What is paleomagnetism? How do you prove that continents move? "Abyssal plains are a major topographic feature of convergent margin setting" – true or false? $1+3+1=5$
5. Why do we study the Mid-Ocean Ridge Basalts to understand the Sea-Floor Spreading? How does continent split? What is the 'Ring of Fire'? $2+2+1=5$
6. What are the mineralogical differences between gabbro and granite? Why are rhyolitic magmas more viscous than basaltic magmas? What is vesicular basalt? "Tephra Cone volcanoes are characterized by basaltic lavas". – Is the statement true or false? What is a laccolith? $1+1+1+1+1=5$
7. Write the name of four minerals that are used as natural resources. Name one mineral that provides solution to environmental problem and one that causes environmental problem. Write short note on the Nebular Hypothesis of origin of the Earth. $2+1+2=5$

(3)

GROUP - B (25 marks)

Answer *all* questions.

8. Answer any *five* questions : $3 \times 5 = 15$
- (a) Define 'erosion'. What are the major agents of erosion? What are the respective roles of degradation and aggradation during peneplanation?
- (b) What is the role of carbonic acids in chemical weathering?
- (c) How did ozone layer form and oxygen rich atmosphere develop on the primitive earth?
- (d) Where does one put the major boundaries in the Geological Time Scale?
- (e) Why is there a marked difference in flow velocity requirement for deposition and subsequent erosion of mud?
- (f) How does paleontological study benefit from the study of sedimentary rocks?
- (g) What are the essential components of life? Discuss.
- (h) Discuss the triggering mechanisms for mass wasting.

(Turn over)