Course Work Examination, July 2023

Aryabhatta School of Earth Sciences

EARTH SCIENCE

Course No. CW-703
(Researth Methodology in Geosciences)

Full Marks: 100
Pass Marks: 50

Time: 3 Hours

The figures in the margin indicate the full marks for questions.
Answer Five Questions, Choosing atleast one from each Unit.

UNIT-I

1. (a) Outline the Principles and applications of Sequence Stratigraphy. 6+4=10

   (b) Describe various graphic measures of grain size analysis. 10

2. (a) What is sedimentary facies? How does it relate to sedimentary environments? 8

   (b) What is facies analysis? How do you measure and record vertical profile sections in the field. 8

   (c) Comment on detritus mineralogy and paleoclimate. 4

UNIT–II

3. (a) Describe the mechanism of magma genesis in an arc tectonic setting with appropriate diagram. Comment on the chemical characteristics of calc-alkaline magma. 10+4=14

   (b) Write on fractionalcrystallization and liquid immiscibility as Magma differentiation processes. 6

4. (a) Discuss the equilibrium crystallization behaviour of magma in the binary diopside-anorthite system and its bearing on fractional crystallization. 10+4=14

   (b) Illustrate the Genesis of tholeiitic magma. 6

UNIT-III

5. (a) Write a descriptive note on the different factors controlling the distribution of foraminifera. 15

   (b) Write a note on the environmental distribution of ostracoda. 5

6. (a) Write a descriptive note on the significance of microfossils in the petroleum exploration. 10

   (b) Give a detail account of planktic foraminifera. 10

UNIT-IV

7. (a) Discuss the deformation mechanisms of rocks at grain scale with neat sketches. 10

   (b) Write descriptive notes on the following: 6+4=10

   (i) Stress-strain relationship for elasto-plastic deformation of rocks.

   (ii) Balance cross section

8. (a) Discuss the principles of stereographic projection techniques with suitable diagrams. 10

   (b) Write descriptive notes on the following: 6+4=10

   (i) Microstructural shear sense indicators

   (ii) Continuum mechanics in structural geology

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