

2016

GEOLOGY

(Major)

Paper : 4-2

(Petrology—II)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Choose the correct answer : 1×7=7

(a) Which of the following magma types is most viscous?

(i) Andesitic magma

(ii) Rhyolitic magma

(iii) Basaltic magma

(iv) Trachytic magma

(b) In the AFM diagram, 'A' stands for

(i) Al_2O_3

(ii) $\text{Al}_2\text{O}_3 + \text{Na}_2\text{O}$

(iii) $\text{Al}_2\text{O}_3 + \text{K}_2\text{O}$

(iv) $\text{Na}_2\text{O} + \text{K}_2\text{O}$

- (c) Andesitic magma is commonly produced by
- (i) heat rising in mantle plumes
 - (ii) pressure release at midoceanic ridges
 - (iii) wet partial melting in subduction zones
 - (iv) compression due to deep burial
- (d) The lateral variations in sediment type in a sedimentary formation are called
- (i) sedimentary structure
 - (ii) sedimentary texture
 - (iii) sedimentary facies
 - (iv) None of the above
- (e) Sediments that are composed primarily of the organic remains of plants and animals are
- (i) arkoses
 - (ii) detrital
 - (iii) biogenic
 - (iv) diagenetic
- (f) Charnockites of India are
- (i) igneous rocks
 - (ii) metamorphic rocks
 - (iii) dynamothermal metamorphism
 - (iv) regional metamorphism

(g) In the thermal metamorphism of impure calcareous rocks, grossularite and diopside are associated with

(i) wollastonite

(ii) anorthite

(iii) either wollastonite or anorthite

(iv) enstatite

2. Answer the following briefly : 2×4=8

(a) Give the Bowen's reaction series.

(b) Write a short note on petrographic province.

(c) Write a note on the basic porosity types seen in carbonate rocks.

(d) Write on geothermobarometry in metamorphism.

3. Answer the following : 5×3=15

(a) Describe the syenite-trachyte family.

Or

What is primary magma? Write a note on origin of magma.

(b) Give petrographic description of limestone.

Or

Write briefly about the physico-chemical factors of sedimentation.

- (c) Write about the petrography and origin of charnockite.

Or

Discuss about prograde and retrograde metamorphism.

4. Answer the following :

- (a) Define the concepts of system, phase and component. Explain with sketches the phase equilibria system of Diopside ($\text{CaMgSi}_2\text{O}_6$) and Anorthite ($\text{CaAl}_2\text{Si}_2\text{O}_8$). Add a note on their petrological significance. 3+5+2=10

Or

Describe the different processes of magmatic differentiation. 10

- (b) Write briefly the classification of sandstone. 10

Or

Write a note on the different types of depositional sedimentary environment. 10

- (c) Describe the various types of metamorphic reactions. 10

Or

Describe the mineral assemblages that form during regional metamorphism of basic igneous rock. 10
