

M.Sc Integ in App Geo Sem-4 Examination

AGLFC-207

Metamorphic Petrology

April 2022

Time : 2-00 Hours]

[Max. Marks : 50

Instructions : All questions in **Section –I** carry equal marks.
 Attempt any **Three** questions in **Section-I**.
 Questions I in **Section-II** is **COMPULSORY**.

Section-i

Q-I	A Explain in detail the concept of protolith and metamorphism	7
	B Explain the terms foliation, banding, schistosity, lineation, pygmatic folds, A-type, S-type, I-type granites, pluton, hydrothermal alteration, exhumation, metamorphic aureole, granofels, and hornfels	7
Q-II	A Providing examples explain the terms paleosome, neosome, leucocratic, melanocratic, mesocratic, metatexites, diatexites, xenoliths, schlieren effect, open system and closed system. Also explain the difference between granites and granitoids	7
	B Explain the concepts of metamorphism and metasomatism and state the major differences in both the process	7
Q-III	A Explain the following 2 processes in detail 1) Hydrothermal alteration 2) Skarn formation and name any 4 types of migmatites	7
	B Stating the definition of metamorphosis, write short notes on pyrometamorphism, combustion, dislocation and cataclastic metamorphism	7
Q-IV	A Defining the grades of metamorphism explain in detail giving examples how grade of metamorphism affects the rock formation process	7
	B Explain in detail the relation of metamorphism with plate tectonics and deformation processes	7
Q-V	A Explain in detail with examples lithostatic and deviatoric stress	7
	B Explain in detail all the controlling factors on the size and shape of the contact aureole	7
Q-VI	A Explain mineralogical phase rule, phase diagram and Gibbs free energy	7
	B State and explain the three criteria's employed in the classification of metamorphic rocks	7
Q-VII	A Based on the mineral assemblage explain the terms describing the general bulk chemical composition of metamorphic rocks	7
	B Define metamorphic facies and explain all its types in detail	7
Q-VIII	A Define metamorphic differentiation and explain its various mechanisms	7
	B Explain in detail the concept of index minerals	7

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Section II

QIX	MCQs	8
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- 1) _____ mineral forms deepest in the earth, where pressures can reach over four kilobars.
 - a) Andalusite
 - b) Kyanite
 - c) Perthite
 - d) Sillimanite

- 2) Phyllite is rich in tiny sheets of _____ mica
 - a) Muscovite
 - b) Biotite
 - c) Sericite
 - d) none

3. Few zeolites can be readily dehydrated and rehydrated, and are used as _____ exchangers and molecular sieves
 - a) Cation
 - b) Anion
 - c) Any
 - d) None

- 4 Anatectic _____ are typically associated with local, in situ partial decompression melting of rock triggered by rapid, tectonic unroofing
 - a) granitoids
 - b) schists
 - c) granofels
 - d) granites

- 5 Hornblende is an _____ rock
 - a) mafic
 - b) ultramafic
 - c) felsic
 - d) ultrabasic

- 6 _____ cleavage occurs when fine clay flakes grow in a plane perpendicular to the compression direction.
 - a) schistose
 - b) platy
 - c) gneissose
 - d) slaty

- 7 Charnockites are found in high-grade metamorphic _____
 - a) Eclogite facies
 - b) granulite facies
 - c) Congreenschist facies
 - d) Blueschist facies

- 8 The concept of " _____ " was introduced into the world of metamorphic geology by E. Bailey in 1962
 - a) Eclogite facies
 - b) Greenschist facies
 - c) Blueschist facies
 - d) Metamorphic facies