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(Pages: 2)

Name:

Reg.No:

SEVENTH SEMESTER M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, NOV. 2025

(CBCSS)

(Regular/Supplementary/Improvement)

CC20GLO7IB14 - ADVANCED IGNEOUS AND METAMORPHIC PETROLOGY

(Geology)

(2020 Admission onwards)

Time : Three Hours

Maximum : 80 Marks

Credit: 4

(Draw neat sketches, wherever necessary)

Section A

I. Answer in one or two sentences. Answer any **ten** questions. Each question carries 2 marks.

1. Rheological critical melt percentage.
2. Perthitic texture.
3. Mode.
4. TAS classification.
5. Boninite.
6. Liquid evolution curve.
7. According to Gibbs Phase rule for the same number of phases when the number of component increases the degree of freedom increases. Evaluate this statement using Di-An and Di-An-Fo system.
8. Discuss Non-equilibrium and metastable mineral formation.
9. Distinguish tension fractures, flattening and shearing.
10. List the possible mineral assemblages for mafic rocks in Eclogite facies.
11. Define Gibbs free energy.
12. Define paired metamorphic belts.

(10 × 2 = 20 Marks)

Section B

II. Write short notes on any **five** of the following. Each question carries 8 marks.

13. IUGS classification.

14. Using the Forsterite-Silica binary system, explain the process of incongruent melting and the formation of different phases. How does this system apply to the crystallization of olivine and quartz in igneous rocks?
15. Crystallization of Forsterite - Diopside - Silica system.
16. Albite – Anorthite - Orthoclase.
17. MgO - Al₂O₃ - SiO₂.
18. Discuss the limits of metamorphism.
19. Discuss contact metamorphism and plot the possible rocks in the metamorphic field gradient.

(5 × 8 = 40 Marks)

Section C

III. Write long essay on any *two* of the following. Each question carries 10 marks.

20. Write an brief essay on Uranium Thorium Lead dating techniques in Igneous Petrology? Add short note on concordia and discordia.
21. Write a brief essay on the Forsterite - Anorthite - Silica.
22. Recall solid-solid reactions and Dehydration reactions.
23. Compare ACF, AKF and AFM diagrams a) Plot Muscovite, Tremolite, Diopside and staurolite in ACF diagram b) Plot Muscovite, Chlorite and Cordierite in AKF diagram c) Plot Biotite in AFM diagram.

(2 × 10 = 20 Marks)
