'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 3rd Semester Examination, 2022

CC5-GEOLOGY

IGNEOUS PETROLOGY

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.

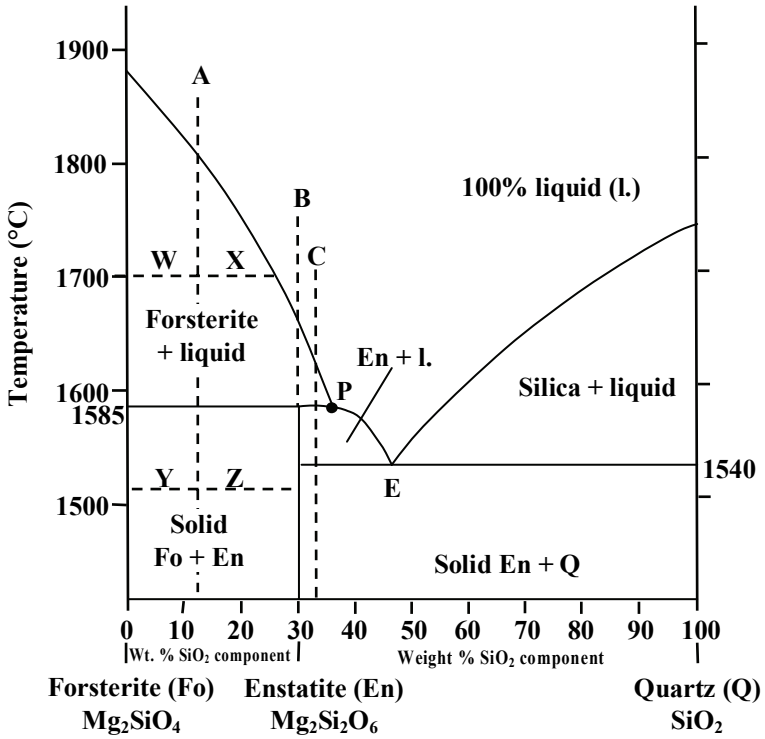
1. Write short notes on any ***five*** of the following: 1×5 = 5
   (a) Phacolith
   (b) Rapakivi texture
   (c) Ropy lava
   (d) Graphic texture
   (e) Mineralogical composition of 'Norite'
   (f) Lapilli
   (g) The volcanic equivalent of 'Granodiorite'
   (h) Picro-Basalt.

2. Answer any ***three*** questions from the following: 5×3 = 15
   (a) Describe Bowen's Reaction Principle and its importance in the evolution of Igneous rocks.
   (b) Describe some of the major physical properties of magma.
   (c) Briefly explain why Earth's Geothermal Gradient shows a bend at the lithosphere Asthenosphere boundary. Draw the Geothermal Gradient for Subduction Zone.
   (d) Describe the significance of QAPF classification using a suitable diagram.
   (e) A crustal rock is at a lithostatic pressure of 3 kbar and a temperature of 275°C. If the lithostatic pressure increases at uniform rate of 0.3 kbar/km and the surface temperature is 25°C, find the Geothermal Gradient.

3. Answer any ***two*** questions from the following: 10×2 = 20
   (a) Draw the effect of water pressure (>500 MPa) on Or-Ab system. What kind of textural features does this phenomenon give rise to?
   (b) Define solid solution. Describe with sketch the equilibrium crystallisation of Albite-Anorthite binary solid solution system.

(c) Describe in brief the course of equilibrium crystallization in Diopside-Anorthite Binary Eutectic System (1 atm dry) for a melt having initial composition Di80-An20 and also show the application of lever rule by using suitable tie lines. What type of texture do you expect at the Eutectic point?

(d) Briefly explain the course of crystallization of points A, B and C in the Fo-Qtz peritectic system given below:



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