

Instructions: (i) Draw neat diagrams whenever necessary.
 (ii) Write proper answer number.

Q-1. Describe pressure-temperature time paths in recrystallized rocks. (14)

OR

Q-1. (a) Chemical equilibrium in metamorphic rocks. (07)
 (b) Schreinmakers rule and construction of petrogenetic grids. (07)

Q-2. Explain diffusion, nucleation, mineral growth and zones in metamorphism. (14)

OR

Q-2. (a) Eclogite facies with suitable examples. (07)
 (b) Amphibolite facies with Indian examples. (07)

Q-3. Write an illustrative note on metasomatism and metamorphism. (14)

OR

Q-3. (a) Ultra-high temperature metamorphism. (07)
 (b) Paired metamorphic belts. (07)

Q-4. Explain Gibb's energy, equilibrium constant and activity coefficients. (14)

OR

Q-4. (a) Equilibrium constant and mole fraction. (07)
 (b) Regular and subregular solutions. (07)

Q-5. **Attempt any seven questions out of twelve.** (14)

- (i) Give differences between schistose fabric and slaty fabric.
- (ii) Draw a diagram of mortar fabric with example.
- (iii) Define retrograde metamorphism and iso reaction grid.
- (iv) Provide mineral constituents of blue schist facies.
- (v) What is the difference between of charnockite and khondalite.
- (vi) Mention the index minerals of sanidinite facies.
- (vii) Define migmatite. and preferred orientation.
- (viii) Draw a labeled diagram of ptygmatic folding and give example.
- (ix) What is ocean floor metamorphism?
- (x) Define close system and isolated system in thermodynamics.
- (xi) Define fugacity and activity.
- (xii) Mention standard state conditions for elements and enthalpy of formation