

[This question paper contains 3 printed pages.]

Your Roll No.

5903

B

B.Sc. (Hons.) Geology/Sem. III

Paper – GEHT-309 : Metamorphic Petrology

Time : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Answer any *Five* questions.

All questions carry equal marks.

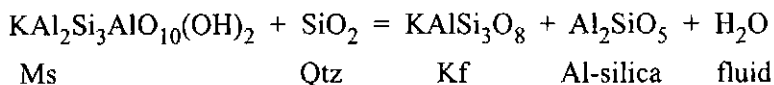
1. (a) Name *two* mineralogical changes which mark transition from greenschist to amphibolite facies in mafic rocks.
- (b) Describe difference between assemblages of granulite and eclogite facies in mafic rocks. 8+7=15
2. What are the major differences in textures of dynamothermal and contact metamorphism ? Illustrate with suitable sketches. 15
3. (a) What is the difference between the nature of reaction curves of solid-solid and devolatilization reactions and why ?
- (b) What defining processes may occur during metamorphism ? Briefly describe each. 7+8=15

[P. T. O.]

4. Write detailed notes on any *three* of the following : $5 \times 3 = 15$
- (a) Metamorphic facies;
 - (b) Phase rule as applied to metamorphic assemblages;
 - (c) Metamorphic reactions;
 - (d) Prograde and retrograde metamorphism;
 - (e) Construction and use of AFM diagram.
5. Answer the following : $3 \times 5 = 15$
- (a) What are metamorphic dehydration reactions ? What kind of rock type generally begins its "metamorphic history" with dehydration reactions, and why ?
 - (b) What is meant by "relict" texture, and what is its significance ?
 - (c) What is a metamorphic "isograd" ?
 - (d) What is "retrograde" metamorphism ?
 - (e) What is the "neomineralization" ?
6. (a) Name six most common types of metamorphic protolith. What chemically characterizes each ?
- (b) Compare the classical notion of an isograd to treating an isograd as a reaction.
7. Eskola originally defined metamorphic facies on the basis of predictable mineral assemblages that develop

in metamorphosed mafic rocks and occur worldwide. How does a modern approach to metamorphic facies differ ? 15

8. (a) What type of reaction is the one below ? Draw rough sketch of reaction curve :



- (b) How do solid-solid net-transfer reactions differ from polymorphic transformations ? Give examples.
- (c) What mineral's absence is diagnostic of the eclogite facies in mafic rocks ? Why is it missing and what replaces it ?
- (d) What is meant by mineral paragenesis ?
- (e) What is the difference between a porphyroblastic and a poikiloblastic garnet in a metamorphic rock ? 3×5=15