

5/H-26 (v) (Syllabus-2015)

2018

(October)

GEOLOGY

(Honours)

**(Igneous and Sedimentary and
Metamorphic Petrology)**

(GELH-501)

Marks : 56

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

Answer four questions, selecting one from each Unit

GROUP—A : IGNEOUS PETROLOGY

UNIT—I

(Introduction)

1. (a) What do you mean by hydrostatic and lithostatic pressure? Discuss briefly on the sources of heat in the earth's interior and how this heat is transferred. 2+6=8
- (b) What factors will determine the movement of magmas? Explain how magma moves through diapirism. 2+4=6

(Turn Over)

(2)

2. (a) When is a system said to be in a state of equilibrium and disequilibrium?

2

(b) Answer the following questions from the given T-X phase diagram :

(i) Why is albite-anorthite system said to exhibit solid solution?

1

(ii) What does the double loop represent?

1

(iii) What is the effect of an albite component if added to pure anorthite?

1

(iv) What is the melting point of pure albite and anorthite?

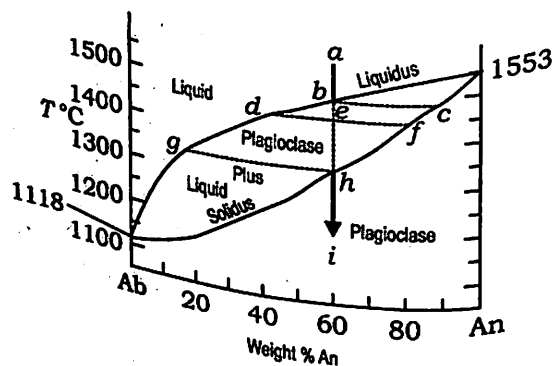
1

(v) Explain the crystallization of melt of composition *a* in the diagram given below.

6

(vi) Write on compositional zoning.

2



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(Continued)

(3)

UNIT—II

(Mineralogy and Petrogenesis)

3. (a) What is nucleation? Explain the relationship between nucleation and crystal growth with the help of a neat diagram.

2+5=7

(b) Write the mineralogical and textural features of any two of the following rocks :

3½×2=7

(i) Nepheline-syenite

(ii) Pyroxenite

(iii) Lamprophyre

4. Discuss on the petrogenesis of basalt. Add a note on its distribution in India.

10+4=14

GROUP—B : SEDIMENTARY AND METAMORPHIC PETROLOGY

UNIT—III

(Sedimentary Petrology)

5. (a) Give the relation between water discharge and flow velocity in an open channel. Discuss on the factors and flow conditions through an open channel.

1+3+4=8

(Turn Over)

D9/105

(4)

(b) Describe with the help of neat sketches how bedforms are generated during sediment transportation. 6

6. (a) What are the various statistical methods used for analysing sedimentary data? Discuss on the estimation of standard deviation from grain size data. 2+3=5

(b) Write short notes on any three of the following : 3×3=9

(i) Walther's Law

(ii) Marine Environment

(iii) Volcaniclastics

(iv) Kurtosis

UNIT—IV

(Metamorphic Petrology)

7. (a) Define metasomatism. Comment on various metasomatic processes. 2+5=7

(b) Explain either (i) isograd and isoreaction grad or (ii) metamorphic grade. 7

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(5)

8. Write short notes on any four of the following : 3½×4=14

(a) Upper limit of metamorphism

(b) Mylonite

(c) Metamorphic facies

(d) Phase rule

(e) Mineral assemblages of metabasic rocks in the amphibolite facies

(f) Metamorphic differentiation

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