M.Sc.(Geology) (NEP Pattern) Semester-I

NEP-52 / PSCGEOT02 - Paper-II : Igneous Petrology

P. Pages : 2 **GUG/W/24/15104**

Time : Three Hours * 5 9 8 7 * Max. Marks : 80

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat sketches wherever necessary.

1. Discuss the nature and composition of magma. Describe the types of magma based on their chemical composition.

OR

Give a brief account of the following:

a) Mid-Ocean Ridge Magmatism.

b) Role of mafic dyke swarms in igneous petrology.

c) Mantle plumes and hot spots.

d) Chemical signatures of magmatism associated with island arcs.

2. Explain the concepts of batch melting and fractional melting.

OR

Explain the following in brief:

a) Liquid Immiscibility in Magma.

b) Phase equilibrium studies in binary and ternary systems.

c) Role of crystal fractionation in magmatic differentiation.

d) Dynamic melting.

3. Discuss the different textures found in igneous rocks.

OR

Discuss briefly the following:

a) AFM Diagrams.

b) Mg number.

c) Alternation index

d) Lever Rule and Its Application.

4. Discuss the significance of alkaline rocks in India, focusing on their petrology and petrogenesis.

OR

Explain the following in brief:

a) Komatiite and its occurrence in India.

b) Petrology of anorthosites and discuss their petrological significance

c) Characteristics of pegmatite formations and their economic importance.

d) Occurrence and characteristics of boninite.

5. Write short notes on:

a) Define magma

b) Metasomatism.

c) Ternary phase

d) Oxygen fugacity

e) Saturation index

f) TAS diagram

g) QAPF Diagram

h) Cation Norm.

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