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3 (Sem-2/CBCS) GLG HC 1

2023

GEOLOGY

(Honours Core)

Paper : GLG-HC-2016

(Elements of Geochemistry)

Full Marks : 60

Time : Three hours

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

1. Answer the following question as directed : 1×7=7

- (a) Which one is the second most abundant element in the earth ?
- (b) How many elements are there in lanthanide series of periodic table ?
- (c) Based on what stable isotopes are fractionated ?
- (d) What is the pH of acid rain ?

Contd.

(e) What type of bonding is found in mineral diamond ?

(f) Which one of the following constitutes more than 90% of the earth's crust ?

(i) Sulphides

(ii) Silicates

(iii) Carbonates

(iv) Sulphates

(Choose the correct answer)

(g) In which type of meteorites, do we find Widmanstätten structure ?

2. Answer the following question : $2 \times 4 = 8$

(a) What is polar bond ? Give one example.

(b) Why core composition of the earth is compared with iron meteorites ?

(c) What is hydrothermal reaction ? Give one example.

(d) Write the ionic radius and atomic weight of K.

3. Answer **any three** question of the following :

$5 \times 3 = 15$

(a) What is chromatography ? Mention the name of different types of chromatography. $2+3=5$

(b) What are the types of diffusion ? What does involve in volume diffusion of solids ? $2+3=5$

(c) What makes stable isotopes useful in geological interpretation ? $2+3=5$

(d) What is chondrule ? Give a brief classification of chondritic meteorites. $2+3=5$

(e) Briefly explain similarities and differences of geochemical behaviour of Si and Al.

4. Answer **any three** question of the following :

$10 \times 3 = 30$

(a) What do you understand by chemical bonding ? Describe briefly ionic bonding and covalent bonding. How does metallic bonding differ from covalent bonding ? $2+5+3=10$

(b) What is partition coefficient ? How bulk distribution coefficient can be calculated ? State the distribution of compatible and incompatible during crystallization of magma. $2+3+5=10$

(c) Briefly describe chemical and mineralogical composition of crust, mantle and core of the earth. Why these three layers are compositionally different ? $8+2=10$

(d) Define ionic potential, hydrogen-ion concentration and oxidation-reduction potential. What is the pH of sea water ? How elements can be divided in sea water ? $6+1+3=10$

(e) What are decay mechanisms ? Briefly describe the U-Th-Pb method of age dating. $3+7=10$

(f) What is variability of magma ? Briefly explain different mechanisms responsible for variability of magma. $3+7=10$