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3 (SEM 4) GEL M1

2015

GEOLOGY

(Major)

Theory Paper : M-4.1

(Crystal Chemistry and Geochemistry)

Full Marks – 60

Time – 2½ hours

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

1. Fill up the blanks with appropriate answers :

1×7=7

- (a) The radius ratio in 12-fold coordination is _____.
- (b) The term Isomorphism was first introduced by _____.
- (c) _____ defect is created by a series of edge dislocations at a regular interval.

[Turn over

- (d) _____ elements have ionic potential greater than 2.
- (e) The hydrogen ion concentration of pure water at 25°C is _____.
- (f) The _____ Rule states that the elements of even atomic number are more abundant than those of odd atomic numbers.
- (g) The _____ elements belongs to the B subgroups of the Periodic Table, whose ions have 18 electrons in the outer shells.

2. Write very short answer of the following : $2 \times 4 = 8$

- (a) What is Enantiotropism ? Give a suitable reaction.
- (b) Differentiate between capture and camouflage.
- (c) What are chondrites ? Give their composition.
- (d) Define hydrogen ion concentration. Mention its importance in sedimentary processes.

3. Write short notes on any *three* of the following :

$5 \times 3 = 15$

- (a) Packing and density.

- (b) Point Defects
- (c) Oxidation- Reduction Potential
- (d) Composition of Lunar rocks.

4. What is geological thermometry ? Briefly describe the different types of geothermometers and their specific uses in geological studies. $2+8=10$

Or

Write short notes on any *two* of the following :
 $5 \times 2 = 10$

- (a) Structure of Diamond
- (b) Isomorphism
- (c) Atomic substitution.

5. What are meteorites ? Briefly describe the different types of meteorites. State the reasons as to why the study of meteorites has gained significance in the recent years. $2+6+2=10$

Or

What are the differences between radioactive and stable isotopes ? Write briefly on the uses of stable isotopes in different geochemical studies.

6. Differentiate between major and trace elements. Briefly describe how major elements get distributed during magmatic crystallization.

2+8=10

Or

What are the principles that govern the distribution of different elements in our cosmos ? Describe briefly the elemental distribution in lunar rocks.

8+2=10