2016/ODD/14/35/ESC–103/402

PG Odd Semester (CBCS) Exam., December—2016

EARTH SCIENCE

(1st Semester)

Course No. : ESCCC–103

(Mineralogy)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. What are chemical bonds? Describe various types of bonds in minerals and write on their properties citing examples. 2+6+4+2=14

2. *(a)* Give an illustrative account of Pauling's rule governing ionic structure of minerals.

(b) What is packing efficiency? Explain giving examples. 10+4=14

UNIT—II

3. Describe garnet group of minerals with respect to their general formula, classification, atomic structure and chemistry. 2+4+4+4=14

4. What are aluminosilicate polymorphs and their petrogenetic significance? Write on their atomic structure giving neat sketches. 6+8=14

UNIT—III

5. Giving general formula and structure, outline the classification of mica group of minerals. Add a note on polytypism. 2+6+4+2=14

6. Write notes on the following : 7+7=14

(a) General formula of Amphibole

(b) SiO_2-polymorphs

UNIT—IV

7. *(a)* What are twinned crystals? Enumerate various symmetry operations that define twinning.

(b) Illustrate common twin laws in feldspars. (2+4)+8=14

8. Enumerate CFT assumptions and discuss crystal field interactions in relation to mineral colours. 4+10=14

UNIT—V

9. Write explanatory notes on the following : 5+5+4=14

(a) Mineral extinction

(b) Biaxial interference figure

(c) Sign of elongation

10. Compare and contrast the following pairs : 5+5+4=14

(a) Wave front and Wave normal

(b) Reflection and Refraction

(c) 2 V and 2 e

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