2019

B.Sc.

1st Semester Examination

GEOLOGY (Honours)

Paper - C 2-T

(Mineral Science)

Full Marks : 40 Time : 2 Hours

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Group - A

Answer any *five* questions of the following : 2×5=10

1. Give examples of two minerals each, having columnar and botryoidal form. 2

2. Name the softest and hardest silicate mineral present in the Moh's scale of hardness. 2

3. What is tenacity ? 2

[Turn Over]

4. Find out the Miller indices of a crystal face that intersecls "a" axis at 3 units, "b" axis at $^1/_3$rd of "a" axis and is parallel to "c" axis. 2

5. Give examples of two minerals each, having silky and pearly luster. 2

6. What is an interference figure ? 2

7. Write down the crystal parameters and axial ratio of hexagonal system. 2

8. What is pleochroism ? Name two pleochroic minerals. 2

Group - B

Answer any *four* questions of the following : 5×4=20

9. (a) Write short note on order-disorder transformation of k-feldspar polymorphs.

   (b) What is exsolution ? Give example. 3+2

10. How would you differentiate between the following in thin section ? (any two)

    (a) Hornblende and Clinopyroxene

    (b) Calcite and Plagioclase Feldspar

    (c) Quartz and Olivine 2.5×2

11. How would you determine optic sign of an uniaxial mineral using gypsum accesory plate ? 5

12. (a) State the law of constancy of inter facial angle.

    (b) What are zone and zone axis ?

    (c) Define roto-inversion. 1+2+2

13. Write down the diagnostic physical properties of any five of the following :

    Pyrite, Galena, Calcite, Garnet, Kyanite, Asbvestos 1×5

14. (a) Define unit cell and crystal lattice.

    (b) What is a Spheroid ?

    (c) Mention the symmetry elements present in a cubic crystal. 2+2+1

Group - C

Answer any *one* question of the following : 10×1=10

15. (a) Classify silicate structures based on Si : O ratio.

    (b) State and explain Pauling's second rule of co-ordination. 6+4

[Turn Over]

16. (a) Write a note on the general formula, structure and chemical composition of pyroxene group of minerals.

(b) When would an anisotropic mineral remain completely dark during 360° stage rotation under crossed polars ? ৫+2