

2017

GEOLOGY

( Major )

Paper : 2·2

( Physical and Descriptive Mineralogy )

Full Marks : 60

Time : 3 hours

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

1. Choose the correct answer : 1×7=7

(a) Aluminium can substitute for which element in phyllosilicates?

(i) Magnesium

(ii) Iron

(iii) Oxygen

(iv) Silicon

(b) Which of the following mineral groups exhibits cyclosilicate structure?

(i) Garnet

(ii) Olivine

(iii) Tourmaline

(iv) None of the above

- (c) What is the value for intercleavage angle in amphiboles?
- (i) 120°
  - (ii) 90°
  - (iii) 78°
  - (iv) 168°
- (d) Aluminosilicate group of minerals include which of the following minerals?
- (i) Sillimanite
  - (ii) Olivine
  - (iii) Pyroxene
  - (iv) Both (i) and (iii)
- (e) Which mineral has a hardness of three (3) in Mohs' scale of hardness?
- (i) Gypsum
  - (ii) Fluorite
  - (iii) Feldspar
  - (iv) Calcite
- (f) The 'streak' of a mineral is the color it produces when
- (i) observed under microscope
  - (ii) powdered by rubbing against a hard surface
  - (iii) hand specimen is observed under sunlight
  - (iv) None of the above

- (g) Epidotes exhibit which silicate structure?
- (i) Orthosilicate
  - (ii) Sorosilicate
  - (iii) Cyclosilicate
  - (iv) Phyllosilicate

2. Answer any *four* of the following questions :

2×4=8

- (a) Define lustre and streak of a mineral.
- (b) Name the minerals having the following compositions :
- (i)  $Mg_3Al_2Si_3O_{12}$
  - (ii)  $KAlSi_3O_8$
  - (iii)  $KAl_2(AlSi_3O_{10})(OH)_2$
  - (iv)  $Fe_2Si_2O_6$
- (c) Write the characteristic features of phyllosilicates. Give suitable examples.
- (d) Write a short note on tourmaline.
- (e) What are the characteristic features of tectosilicates? Name one mineral group exhibiting tectosilicate structure.

3. What is the silicate structure of olivine group? Write the chemical, physical and optical characters of olivine group of minerals.

1+(3+3+3)=10

( 4 )

4. What do you mean by perthite and antiperthite? Give the chemical composition, physical and optical properties of feldspar group of minerals.  $4+(2+2+2)=10$

5. Write short descriptions of any *three* of the following minerals :  $5 \times 3 = 15$

(a) Kyanite

(b) Apatite

(c) Chlorite

(d) Rutile

(e) Calcite

6. Write a note on the atomic structure, chemical composition and physical and optical properties of mica group of minerals. 10

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