

2019

Part – II

GEOLOGY

(Honours)

Paper – IV

(Theory)

Full Marks – 90

Time : 4 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Result must be recorded in tabular form as far as possible.

GROUP – A

- A. Answer the following questions: (any two)**
1. What do you understand by palaeomagnetism and geomagnetism ? What is Apparent Polar Wandering Path (APWP) ? 3+2
 2. What is ophiolite ? Draw a neat sketch of the ophiolite sequence. 5

3. Describe with neat sketch, Wilson cycle. 5
4. Discuss sea floor spreading. Why are rocks older than 200 ma not found on ocean floor? 5

B. Answer the following questions : (any one)

1. Write evidences in favour of the continental drift theory. 10
2. What is plate tectonic theory ? Describe different types of plate boundaries and their characteristic features, with neat sketches. 2+8

GROUP – B

A. Answer the following questions : (any two)

1. Write a note on Ramsay's classification of strain ellipses. Where does a sphere plot in this diagram? 4+1
2. What are principal axes and principal planes of stress ? Define normal and shear stress. How would you represent stress at a point in two dimensions ? 2+2+1

3. How would you recognize faults in field ? 5
4. How are hook-shaped folds formed ? Differentiate between a duplex structure and an imbricate structure with sketches. 2+3

B. Answer the following questions : (any one)

1. What do you understand by the terms brittle, plastic and viscous behavior of rocks ? Illustrate your answer with suitable stress-strain diagrams. Give examples of geological structures that develop during brittle and plastic deformation. 8+2
2. What are fringe joints and rib marks ? Establish the geometrical relations of joints with folds and faults with neat sketches. 2+8

GROUP – C

A. Answer the following questions : (any three)

1. (i) Define alkaline rock. Give example. 2
- (ii) Classify the alkaline rock according to agpaicity index. 3

2. (i) State the phase rule. 1
- (ii) Describe the phase rule through a binary eutectic system. 4
3. (i) Write the petrographic significance of Fo-SiO₂ system. 3
- (ii) Why olivine crystals formed in Fo-SiO₂ system are not magmatically dead? 2
4. (i) What is petrogeny's residua system? 1
- (ii) Write a short note on the thermal valley of this system. 2
- (iii) What is Lucite albite incompatibility? 2
5. Describe the equilibrium crystallization of Fo rich liquid in Di-Fo-SiO₂ system. 5
6. Write a short note on basalt tetrahedron. 5

B. Answer the following questions : (any one)

1. (i) Write two differences between massive and layered anorthosite with their Indian occurrences. 2
- (ii) Write different types of granite according to the depth and according to their origin. 4
- (iii) Write the petrology of lamprophyre and kimberlite. 4
2. (i) Describe the fractional crystallization of Di rich liquid in Di-Ab-An system. 6
- (ii) Write petrogenetic significance of Ab-An system. 4

GROUP – D

A. Answer the following questions : (any three)

1. (i) What is devolatilization reaction ? 2
- (ii) Write the different types of devolatilization reaction. 3

2. (i) What is the relation between metamorphic grade, zone and facies ? 3
- (ii) Write the Barrovian sequences of index minerals. 2
3. (i) What is UHT metamorphism ? 2
- (ii) What types of mineralogy you can expect in metamorphosed calcsilicate rocks and mafic granulite ? 2
- (iii) What is migmatite ? 1
4. Write a short note on eclogite and blueschistfacies. 5
5. Write regional metamorphism of pelitic rocks in medium P-T. 5
6. Write the significance of ACF and AKF diagram. 5

B. Answer the following questions : (any two)

1. (i) State schrnmaker's rule. 3

- (ii) Construct a P-T diagram using the above rule with the phase spinel, Enstatite, Corundum, Cordiarite, Fosterite with full description. 7
2. (i) Describe contact metamorphism of calcsilicate rock in open system. 6
- (ii) Write a short note on P-T-t path. 4
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