

**CC/M/EXAM.
2020**

GEOLOGY

PAPER—II

Time : 3 hours]

[Full Marks : 250

Note : Question Nos. **1** and **5** are compulsory and out of the remaining, any **three** are to be attempted choosing at least ONE question from each Section. The number of marks carried by a question/part is indicated against it.

SECTION—A

1. Answer *any five* of the following questions :

- (a) Write on the symmetry elements of the holohedral class of the isometric crystal system. Represent the symmetry elements using Hermann–Mauguin crystallographic notation. 7+3=10
- (b) Write on the types of twinning in feldspars. 10
- (c) Explain Bowen's reaction principle. 10
- (d) Write on petrogenetic significance of textures in igneous rocks. 10
- (e) What is retrograde metamorphism? Write on the evidences of retrograde metamorphism. 10
- (f) Explain how heavy minerals in sediments help in predicting the provenance. 10
- (g) Write on the types of cross-stratifications found in sedimentary rocks. 10

2. Answer the following questions :

- (a) Discuss silicate structures of rock forming minerals and explain how the silicate minerals are grouped. 20
- (b) Write on compositional variation and optical properties of the feldspar group of minerals. 15
- (c) Write on the optical properties observed under microscope to identify mineral grains. 15

3. Answer the following questions :

- (a) Elaborate the textures and structures of igneous rocks. 20
- (b) Write briefly on magmatic differentiation and assimilation processes. 15
- (c) Explain what causes the metamorphic grade. Write on the recognizable attributes of metamorphic rocks of different grades. 5+10=15

4. Answer the following questions :

- (a) Write in detail on classification of clastic sedimentary rocks on the basis of mineralogy and texture. 20
- (b) Give an overview on sedimentary basins of India and also briefly discuss their petroleum prospects. 10+5=15
- (c) Write on the depositional primary sedimentary structures. 15

SECTION—B

5. Answer *any five* of the following questions :

- (a) What are metallogenic epochs and provinces? Give Indian examples. 8+2=10
- (b) Write on marine mineral resources of India. 10
- (c) Explain the processes of ore localization. 10
- (d) Explain how reserve estimation of stratified ore deposits is made. 10
- (e) Write the importance of geochemical mapping for mineral exploration. 10
- (f) Write briefly on cosmic abundance of elements. 10
- (g) Discuss the likely environmental impact of improper dumping of coal mine waste. 10

6. Answer the following questions :

- (a) Write on textures and structures of ore and their significance. 20
- (b) Give a geological account on East Coast bauxite deposits of India. 15
- (c) Write on the distribution and quality of Tertiary coal deposits of India. 15

7. Answer the following questions :

- (a) Write the methods of geological prospecting for mineral exploration. 20
- (b) Discuss the principles of geophysical prospecting. 15
- (c) Give a schematic outline for exploration of copper and its subsequent mining. 15

8. Answer the following questions :

- (a) Write the internal elemental composition of the earth. 20
- (b) Discuss the causes of pollution of surface as well as subsurface water in urban area and its immediate surroundings. 15
- (c) Explain the causes of sea-level changes through geological time. 15
