

GEOLOGY

Time Allowed : 3 hours

Full Marks : 100

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

Question no. 1 is compulsory.

*Attempt any other 6 (six) questions
taking at least 3 (three) questions from each section.*

- 1.** Write the correct answer using code
[(i) or (ii) or (iii) or (iv)]
- (a) The Mid-Atlantic Ridge System is an area of: **(1½)**
- (i) Shear Plate Boundary.
 - (ii) Consuming Plate Boundary.
 - (iii) Accreting Plate Boundary.
 - (iv) Stable Plate Boundary.
- (b) Sand-dunes migrate in the **(1)**
- (i) Leeward direction.
 - (ii) Windward direction.
 - (iii) Both leeward and windward directions.
 - (iv) None of the above.

(Contd. 2)

- (c) Schuppen structures are associated with **(1½)**
- (i) Normal faulting.
 - (ii) Reverse faulting.
 - (iii) Thrust faulting.
 - (iv) Recumbent folding.
- (d) Nummulites were the abundant rock-building foraminifers during **(1)**
- (i) Silurian period.
 - (ii) Jurassic period.
 - (iii) Permian period.
 - (iv) Eocene epoch.
- (e) Which of the following is a fundamental rock unit? **(1)**
- (i) Group
 - (ii) Formation
 - (iii) Member
 - (iv) Bed
- (f) An impermeable formation that neither contains nor transmits water is called **(1)**
- (i) Aquifer
 - (ii) Aquiclude
 - (iii) Aquifuge
 - (iv) Aquitard

(Contd. 3)

- (g) Leucosene is a variety of **(1½)**
- (i) Tourmaline
 - (ii) Talc
 - (iii) Topaz
 - (iv) Sphene
- (h) The process of crystallization in a binary magma of eutectic proportions takes place in **(1½)**
- (i) Three stages
 - (ii) Two stages
 - (iii) A single stage
 - (iv) None of the above
- (i) The evaporite that is typical of non-marine environment is **(1½)**
- (i) Gypsom
 - (ii) Halite
 - (iii) Trona
 - (iv) Calcite
- (j) Kudremukh in Karnataka is famous for **(1½)**
- (i) Copper deposit
 - (ii) Iron deposit
 - (iii) Gold deposit
 - (iv) Pb-Zn deposit

(Contd. 4)

- (k) A horizontal entry into an ore-body is called **(1½)**
- (i) Adit
 - (ii) Shaft
 - (iii) Bench
 - (iv) Pit
- (l) Rubidium is commonly found dispersed in **(1½)**
- (i) K-rich minerals
 - (ii) Ca-rich minerals
 - (iii) Na-rich minerals
 - (iv) Al-rich minerals

SECTION - A

2. Write descriptive notes on the following: **(4×3½=14)**
- (a) Interior of the Earth.
 - (b) Sea-floor spreading.
 - (c) Solar system.
 - (d) Volcanic belts.
3. (a) Explain how geomorphology is useful in mineral exploration citing suitable examples. **(7)**
- (b) Discuss broad geomorphic features of Indian-subcontinent **(7)**
4. (a) Give a detailed classification of folds. **(7)**
- (b) Discuss in detail and with suitable sketches the mechanics of faulting. **(7)**
5. (a) Elucidate the evolutionary trends in Equidae. **(7)**
- (b) Discuss Cretaceous-Tertiary boundary citing Indian examples. **(7)**
6. Write explanatory notes on any four of the following **(4×3½=14)**
- (a) Movement of subsurface water
 - (b) Water bearing properties of rocks.
 - (c) Ground water recharging.
 - (d) Earthquake resistant structures.
 - (e) Alkali-aggregate reaction.

(Contd. 6)

SECTION - B

7. Write short notes on any seven of the following:
(7×2=14)
- (a) Pleochroism
 - (b) Extinction angle
 - (c) Double refraction
 - (d) Birefringence
 - (e) Twinning
 - (f) Optic axis
 - (g) Nicol prism
 - (h) Symmetry elements
 - (i) Bragg's law
 - (j) Crystal defects
8. Write Petrological notes on any four of the following:
(4×3½=14)
- (a) Reaction Principle
 - (b) Magmatic differentiation
 - (c) Magmatic assimilation
 - (d) Granitisation
 - (e) Migmatites
 - (f) Metasomatism

(Contd. 7)

9. Give tectonic classification of sedimentary basins of India citing Indian examples for each type. **(14)**

10. (a) Define the following: **(4×1=4)**

- (i) Ore
- (ii) Ore minerals
- (iii) Gangue
- (iv) Tenor of ore

(b) Write one most important ores for each the following metals: **(10×½=5)**

- (i) Aluminium
- (ii) Chromium
- (iii) Copper
- (iv) Gold
- (v) Lead
- (vi) Zinc
- (vii) Manganese
- (viii) Uranium
- (ix) Iron
- (x) Thorium

(c) Write descriptive notes on the following: **(2×2½=5)**

- (i) National Mineral Policy
- (ii) Law of Sea

(Contd. 8)

11. (a) Define the following; **(4×1=4)**
- (i) Trace Elements
 - (ii) Coordination number
 - (iii) Isomorphism
 - (iv) Polymorphism
- (b) Discuss the following: **(4×2½=10)**
- (i) Environmental impact of urbanization
 - (ii) Radioactive waste disposal
 - (iii) Dumping of mine waste and fly-ash
 - (iv) Legislative measures of environmental protection in India.

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