

Serial No.

4099

D-FDN-K-HC

GEOLOGY
Paper—III

Time Allowed : Three Hours

Maximum Marks : 200

INSTRUCTIONS

Candidates should attempt SIX questions in all including Question No. 1, which is compulsory, from Part—I and attempt ONE question each from Sections A, B, C, D and E from Part—II.

The number of marks carried by each question is indicated at the end of the question.

Answers must be written only in ENGLISH.

Symbols and abbreviations are as usual.

Neat sketches may be drawn to illustrate answers, wherever required.

PART—I

1. Write notes on any TEN of the following :—

5×10=50

(i) Skarns and ore deposits

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(Contd.)

- (ii) Minerals used in ceramic industries
- (iii) Rare earth mineral occurrences of India
- (iv) Mineralisations associated with acidic igneous rocks
- (v) Assaying and Assay width
- (vi) Macro- and Micro-textures of metamorphosed ores
- (vii) Marine and Palaeo Placers
- (viii) Geochemical Sampling
- (ix) Coal measures and Cyclothems
- (x) Petroleum oil logging
- (xi) Failures of Reservoirs
- (xii) Magnetic anomaly and its interpretation.

PART—II

SECTION—A

2. Describe the mode of occurrence, structural control if any and genesis of lead-zinc deposits of Zawar group of mines of Rajasthan. 30
3. Write notes on the following :— 6×5=30
- (i) Khetri Copper belt, Rajasthan
 - (ii) Iron and Manganese ores of Bihar and Orissa
 - (iii) Gems and Gemstones of India
 - (iv) Miner Price Index and its Calculation
 - (v) Minerals and Sustainable Development.

SECTION—B

4. What are the different classes of Volcanogenic Sulphide-deposits found in nature ? How these deposits are distributed in space and time ? Describe the tectonic setting and genesis of such deposits. 7+8+15=30
5. Write notes on the following :— 6×5=30
- (i) Regional metamorphism of manganese ores
 - (ii) Submarine volcanism and ore deposition
 - (iii) Sources of hydrothermal ore mineralisation
 - (iv) Podiform and stratiform chromite ores
 - (v) Kimberlites and diamond genesis.

SECTION—C

6. Describe different methods of underground mine mapping and sampling. How are you going to determine the 'Assay width' of (a) vein type and (b) stratiform ore bodies ? How are you going to calculate the average width and grade of such ore bodies ? 16+7+7=30
7. Write notes on the following :— 6×5=30
- (i) Diamond drill
 - (ii) Pedgeochemical and Atmogegeochemical methods of Prospecting methods.
 - (iii) Application of Remote Sensing for mapping altered rocks and mineralogical composition around a mineral deposit.
 - (iv) Principles of Gravity method of exploration.
 - (v) Local Prospecting of economic mineral deposits.

SECTION—D

8. Attempt a critical review of in situ and drifted theories of accumulation of coal deposits. Describe the Coalification Processes. Write briefly on regional and contact metamorphism of coal deposits. $10+10+10=30$
9. Write notes on the following :— $6 \times 5 = 30$
- (i) Organic origin of Petroleum
 - (ii) Petroleum Exploration
 - (iii) Coal Seam Correlation
 - (iv) Gas Hydrate and Natural Gas Deposits
 - (v) Radioactive Placer Minerals of India.

SECTION—E

10. Give a general account of stability of a slope. In what condition a particular part of a slope is likely to suffer failure ? What are different types of 'Mass Failures' ? Explain salient features in each case. $5+5+10+10=30$
11. Write notes on the following :— $6 \times 5 = 30$
- (i) Geological investigations necessary for Reservoir Construction
 - (ii) Methods of Tunnelling
 - (iii) Monitoring and Controlling of Mass Movements
 - (iv) Engineering Protection of erosion of Shores
 - (v) Problems of Groundwater in Engineering Projects.