भू-विज्ञान परीक्षा 2012
Geologist Examination

D–HMF–M–HFC

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 are to be drawn to illustrate answers, wherever required.

All parts and sub-parts of a question being attempted are to be completed before moving on to the next question.

PART—I

1. Write short notes/Attempt in brief the following, with sketches wherever appropriate : 5×10=50

(a) Sediment-hosted Pb-Zn sulfide deposits in India

(b) Concept of isochores

(c) Mention the name of a major ore deposit in India

(i) along a crustal scale shear zone;

(ii) in a granitoid complex;

(iii) in a mafic-ultramafic plutonic complex;

(iv) in a kimberlite pipe;

(v) in a strata-bound mineral deposit.

(d) Rajasthan gypsum deposits

(e) Concept of fluid inclusion homogenisation

(f) Common matamorphic ore textures

(g) Sampling methods in an underground mine

(h) Coalification

(i) Any two recently discovered hydrocarbon fields in India

(j) γ-ray logging

PART—II

Section—A

2. *(a)* Describe the geographic extent of a metallogenic province of copper and show the locations of major deposits in a sketch map of India. 15

(b) Discuss the geological environment of the iron ore deposits and metallogeny in space and time in India. 15

3. Write notes on the following : 5×6=30

(a) BIF-hosted iron ores of Karnataka

(b) Geologic setting and host rock association in different gold deposits in the Dharwar craton

(c) Specifications and distribution of limestones for iron and steel industry in India

(d) Sporadic occurrence of chromite ores along Indus-Tsangpo suture

(e) Mineral concession rules in India

(f) Malanjkhand Cu-Mo deposit, Madhya Pradesh

Section—B

4. *(a)* What is an ophiolite? Mention three major world examples and describe any example from India. Draw a labelled stratigraphic column of an ophiolite sequence and point out the different ore types. 15

(b) With the aid of sketches, discuss metallogeny in komatiites. 15

5. Write notes on the following : 5×6=30

(a) Crustal fluids and ore genesis

(b) SEDEX-type deposits

(c) Rarity of Pb in Archean deposits

(d) Algoma and superior types of iron ores

(e) Black smokers

(f) Kuroko and Cyprus types of ore deposits

Section—C

6. *(a)* Distinguish between primary and secondary dispersion patterns. Enumerate the factors which influence such patterns. 10

(b) Discuss the role of primary and secondary dispersion in geochemical exploration of ore deposits. 10

(c) Differentiate between IP and SP methods of electrical surveys. 10

7. Write notes on the following : 5×6=30

(a) Borehole deviation

(b) True and false anomaly

(c) Resistivity logging

(d) Orientation survey

(e) Corrections applied to gravity data

(f) Stream sediment survey

Section—D

8. (a) Give an account of the surface indications that may lead to the discovery of oil and gas. 8

(b) With the aid of labelled sketches, highlight the different types of reservoir traps in which oil and gas accumulate. 12

(c) Discuss the prospects of lignite as a source of energy in India. 10

9. Write notes on the following : 5×6=30

(a) Beneficiation of coal

(b) Neyveli lignite

(c) Secondary uranium minerals

(d) G-M counter, principles of operation and applications

(e) Well logging techniques

(f) Lithotypes and macerals

Section—E

10. (a) What are the geological parameters to be assessed while locating a suitable dam site on *(i)* igneous rocks, *(ii)* metamorphic rocks and *(iii)* sedimentary rocks? Discuss with the aid of Indian examples. 24

(b) What steps can be taken to prevent disasters caused by landslides in hilly terrains? 6

11. Write notes on the following : 5×6=30

(a) Factors that determine the safety and stability of tunnels

(b) Soil properties for engineering projects

(c) Methods of increasing the stability of shorelines

(d) Earthquake zones in India

(e) Foundation problems of bridges

(f) Reservoir failures

★ ★ ★