Indian Forest Service Examination-2012

D–GT–M–HMB

GEOLOGY

Paper—II

Time Allowed : Three Hours	Maximum Marks : 200

INSTRUCTIONS

Candidates should attempt Question Nos. 1 and 5 which are compulsory, and any THREE of the remaining questions, selecting at least ONE question from each Section.

The number of marks carried by each question or its parts is indicated against each.

Answers must be written in ENGLISH only.

Neat sketches may be drawn, wherever required.

Important Note

All parts/sub-parts of a question being attempted are to be answered contiguously on the answer-book. That is, where a question is being attempted, all its constituent parts/sub-parts must be answered before moving on to the next question.

Pages left blank, if any, in the answer-book(s) must be clearly struck out. Answers that follow pages left blank may not be given credit.

Section—A

1. In about *150* words each, answer the following : 10×4=40

(a) Describe the symmetry elements and unit form of the normal class of cubic system. Mention the names of common minerals that crystallise in this class.

(b) Write a note on twinning and its various types that are generally observed in the minerals.

(c) Explain the crystallisation of silicate magmas on the basis of reaction principle.

(d) With the help of neat sketches, bring out the difference between porphyritic and poikilitic type of textures in igneous rocks.

2. (a) Briefly describe the minerals that belong to the mica group, stating the diagnostic physical and optical properties of each of them. Add a note on their mode of occurrence and common associations citing Indian examples. 30

(b) Discuss the significance of grain size in the studies of sedimentary rocks. 10

3. Write explanatory notes on the following : 10×4=40

(a) Pleochroism

(b) Ophiolite complexes

(c) Zones of metamorphism

(d) Diagenesis and lithification

4. (a) Classify the common types of continental and marine environments of sedimentation, mentioning the conditions of deposition and resulting deposits of each type. 30

(b) Bring out the general diagnostic physical and optical properties of the felspar group of silicate minerals. 10

Section—B

5. Answer the following. Answers to be brief and to the point : 8×5=40

(a) Identify the State to which the following mineral deposits belong and state the common mode of occurrence and principal process of formation of each of them :

(i) Dalli-Rajhara iron ore deposit

(ii) Sukinda chromite deposit

(iii) Neyveli lignite deposit

(iv) Panna diamond deposit

(v) Ankleshwar petroleum deposit

(b) Cite any two examples each of the mineral deposits formed by the following processes :

(i) Hydrothermal cavity-filling process

(ii) Supergene sulphide enrichment

(iii) Residual concentration

(iv) Mechanical concentration in beaches

(v) Metamorphism

(c) Clarify the difference between—

(i) resources and reserves;

(ii) proved and possible categories of reserves;

(iii) channel and grab sampling;

(iv) geobotanical and biogeochemical surveys.

(d) Compare and contrast the phenomenon of isomorphism and polymorphism of minerals, giving suitable examples.

(e) Discuss the hazards of unscientific disposal of industrial and radioactive wastes in nature.

6. (a) Give a brief account of the physico-chemical environments of formation of hydrothermal deposits and their classification on this basis. Give appropriate Indian examples. 30

(b) Briefly describe the structural controls of ore localisation. 10

7. (a) Enumerate various methods of prospecting of mineral deposits. 20

(b) Which prospecting method(s) will you recommend for prospecting of gold and why? 20

8. Write brief notes on the following : 10×4=40

(a) Ionic bonding in minerals

(b) Zonal structure of earth

(c) Advantages and disadvantages of open-cut mining

(d) Coastal erosion

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