भारतीय वन सेवा परीक्षा 2011
981 Indian Forest Services Examination

D-VSF-L-TYB

GEOLOGY

Paper II

Time Allowed : Three Hours | *Maximum Marks : 200*

INSTRUCTIONS

Candidates should attempt Questions No. 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 part is indicated against each.

Answers must be written in ENGLISH only.

Neat sketches may be drawn, wherever required.

The attached maps are to be used for answering Questions No. 1 (e) and 5 (b). Then the map may be detached from the question paper and attached firmly to your answer book.

SECTION A

1. Answer any ***four*** of the following. Answer to questions 1(a), 1(b), 1(c) and 1(d) should be in about 150 words each. *4×10=40*

(a) Describe the optical and crystallographic properties by which an isometric mineral can be distinguished from minerals of all other crystal systems.

(b) What are the factors responsible for the following properties of minerals ?

(i) colour;

(ii) lustre;

(iii) specific gravity;

(iv) hardness.

Give suitable examples to justify the answer.

(c) Describe the petrographic characteristics of kimberlite. Write a note on the origin of kimberlite. Give Indian examples of kimberlite occurrences.

(d) Draw the phase diagram and describe the P – T conditions of metamorphism in which the alumina-silicate polymorphs andalusite, kyanite and sillimanite are formed.

(e) Mark the following geological features in the given outline map of India along with a brief description :

(i) Deccan volcanic province;

(ii) Cuddapah basin;

(iii) Eastern Ghats granulite terrain;

(iv) Closepet granite.

2. (a) Describe the structural classification of silicates with neat sketches and suitable examples. *20*

(b) Write the differences between

(i) solid solution & exsolution; and

(ii) isomorphism & polymorphism

with suitable examples from minerals. *20*

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

(a) IUGS classification of igneous rocks

(b) Anorthosite, its origin and Indian examples

(c) Contact metamorphism of carbonate sediments

(d) Archean greenstone belt

4. (a) Describe the sedimentary facies in a typical marine environment. *20*

(b) Describe the proxies by which provenance of sediments can be recognised. *20*

SECTION B

5. Answer any ***four*** of the following. Answer to questions 5(c), 5(d) and 5(e) should be in about 150 words each.

4×10=40

(a) Match the following :

(1)	Oxide mineral	Wolframite
(2)	Sulphide mineral	PGE
(3)	Nuclear fuel	Pitchblende
(4)	Fossil fuel	Chromite
(5)	Base metals	Magnetite
(6)	Precious metals	Graphite
(7)	Hydrothermal deposit	Coal
(8)	Magmatic deposit	Phosphorite
(9)	Metamorphic deposit	Copper-lead-zinc
(10)	Sedimentary deposit	Pyrrhotite

(b) Mark the following ore deposits in the given outline map of India along with a brief description :

(i) Zawar zinc-lead deposit;

(ii) Khetri copper belt;

(iii) Byrapur chromite deposit;

(iv) Jaduguda uranium deposit.

(c) Describe different structural types of sulphide minerals with examples.

(d) Write any two diagnostic properties and the principal uses of the following economic minerals :

(i) Chalcopyrite

(ii) Galena

(iii) Chromite

(iv) Hematite

(v) Wollastonite

(e) What are rare earth elements ? Describe their significance in understanding the genesis of igneous rocks.

6. (a) What is magmatic deposit ? What are the processes by which magmatic deposits are formed ? Explain with examples. *20*

(b) Describe the geological characteristics of the following mineral deposits in India : *20*

(i) East coast bauxite deposit;

(ii) Mangampeta barite deposit;

(iii) Gondite type manganese deposit;

(iv) Neyveli lignite deposit.

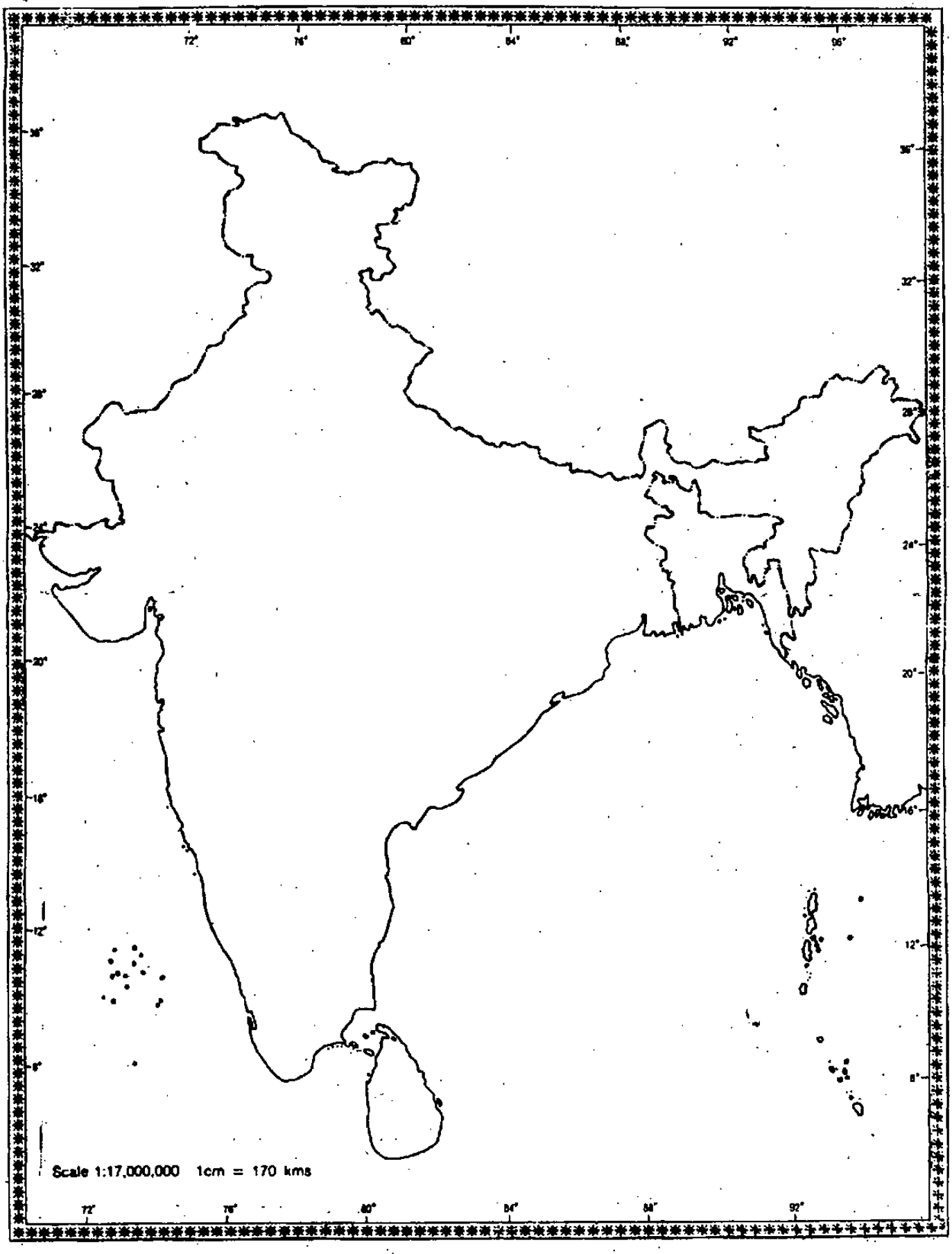
7. (a) Describe various methods of conservation of mineral resources. *20*

(b) A vein type copper ore body is exposed in a plain area and it is explored by trenching. The ore body has a strike length of 175 m along NE-SW and the dip is vertical. Six trenches are made across the ore body at a constant interval of 25 m. Following are the widths of the ore body measured at these trenches from NE to SW : 2·9, 1·7, 3·2, 2·1 and 2·7 m. The specific gravity of ore is 2·85. Calculate the tonnage of ore body up to a depth of 50 m assuming that the ore body is continuous. *20*

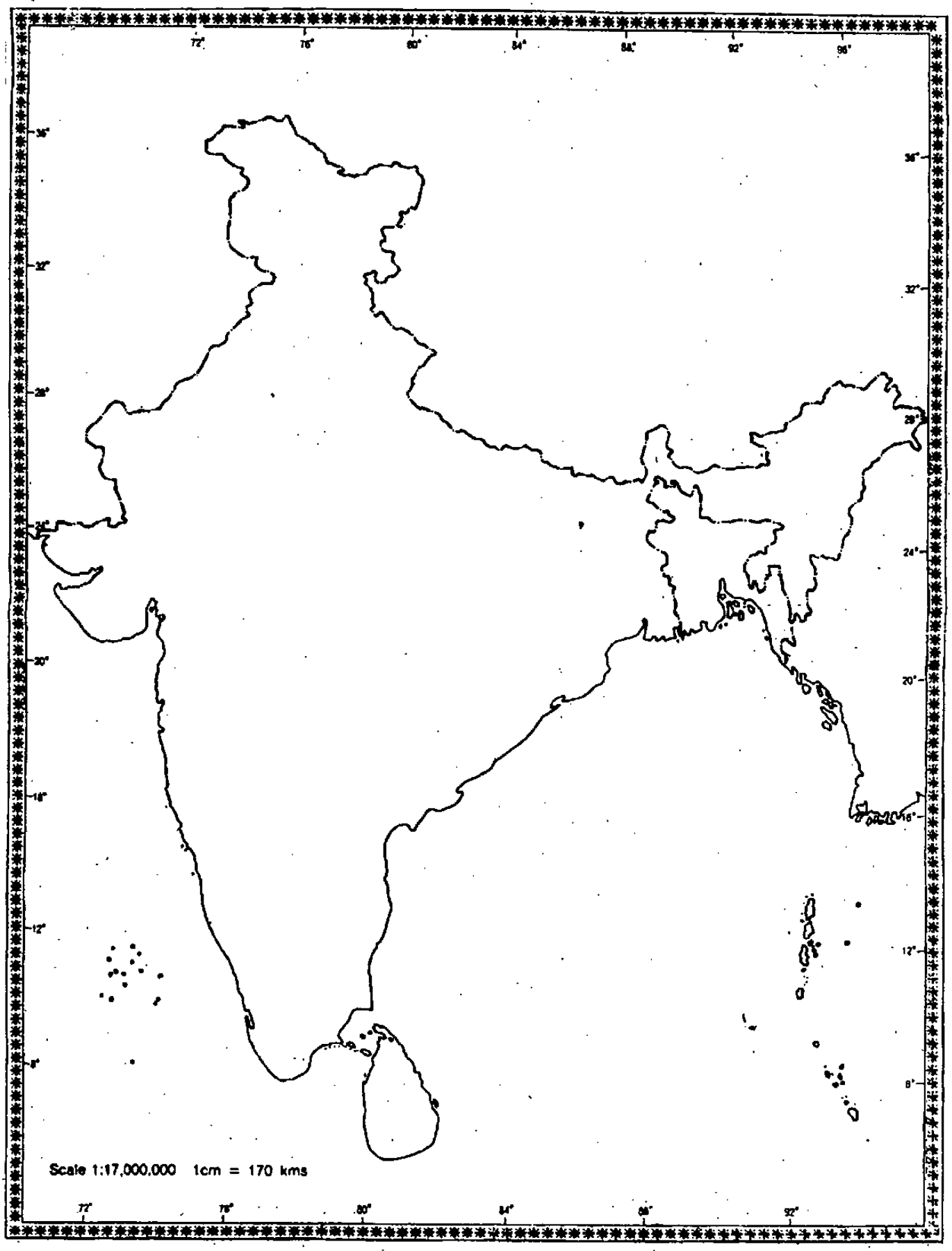
8. (a) Describe the variation in silicate mineral assemblage and silicate structure in the mantle. *20*

(b) What is hazard zonation ? Describe the zonation mapping of any one natural hazard in the Indian context. *20*

For Q. 5 (b)



For Q. 1 (e)


72°
76°
80°
84°
88°
92°
96°
36°
32°
28°
24°
20°
16°
12°
8°
Scale 1:17,000,000 1cm = 170 kms