[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 1706 **C** **Roll No.....**

Unique Paper Code : 219403

Name of the Course : B.Sc. (Hons.) Geology

Name of the Paper : GEHT 402 : Economic Geology

Semester : IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer any **five** questions.
3. **All** questions carry equal marks.
4. Question No. **1** is compulsory.

1. Answer the following : (3+6+2+2+1+1)

(i) Arrange the minerals according to their increasing hardness :
Pyrite, Chalcopyrite, Galena, Heamatite, Orpiment, Ilmenite

(ii) Match each appropriate member of the column A with that of B.

A Deposit type	**B Associated rock**
(i) Cu-Pb-Zn sulphides (Kuroko massive sulphides)	Ophiolites
(ii) Cu-Zn-Fe sulphides (Cyprus massive sulphide)	Gabbro
(iii) PGE	Dacite/Rhyolite
(iv) Chromite	Basalt
(v) Porphyry Cu Deposit	Diabase sills/dykes
(vi) Fe–Ti magnetite	Calc alkaline rock

P.T.O.

(iii) Garnet, pyroxene, and amphibole are present in all skarn types and they show marked compositional variability. Complete the following sentences.

(a) The manganiferous pyroxene, johannsenite is present almost exclusively in _____ skarns. Its presence is definitive of this skarn type.

(b) Amphiboles from Cu, Mo, and Fe skarns are progressively more _____ rich in the tremoliteactinolite series.

(iv) What are ore and gangue ?

(v) Banded iron formation in India formed by _____ .

(vi) A process of ore formation, by which leaching of soluble elements leaving concentrations of insoluble desirable elements takes place, is _____ .

2. Write short notes on (any **three**) :

(a) Secondary supergene enrichment

(b) Discordant ore bodies

(c) Genetic classification of ores

(d) PGE (5×3=15)

3. Distinguish between the following **(any three)** :

(a) Stratiform and Podiform chromite

(b) Origin of ore due to internal processes and that due to surface processes

(c) Syngenetic and Epigenetic Deposits

(d) Algoma type iron and Superior type iron (5×3=15)

4. Write diagnostic optical properties to distinguish between :

(i) Chalcopyrite and Pyrrhotite

(ii) Pyrite and Galena

(iii) Psilomelane and Ilmenite (5×3=15)

5. (a) Discuss in detail the origin, properties and transport of hydrothermal fluids. How are metals transported in hydrothermal solutions ? (15)

OR

(b) Discuss in detail the chemical controls and stratigraphic controls of ore localization.

6. Describe the distribution, geological setting and mineralogical characteristics of Cu ore deposits in India. (15)

OR

Describe the distribution, geological setting and mineralogical characteristics of Pb-Zn deposits in India.

7. What are placer deposits and what factors affect their formation ? Name their different types and four minerals that commonly form placer deposits. (15)

8. Write notes on nature and distribution of Indian deposits used in the following industries **(any three)** (15)

(a) refractory

(b) chemical

(c) fertilizer

(d) cement