

Ex/SC/GEOL/UG/CORE/TH/12/2025

B.Sc. GEOLOGICAL SCIENCE EXAMINATION, 2025

(3rd Year, 1st Semester)

GEOLOGICAL SCIENCE

PAPER : CORE 12

(ECONOMIC GEOLOGY)

Time : Two Hours

Full Marks : 40

Use a separate Answer Script for each Part.

PART—I (20 Marks)

Answer **all** questions :

1. (a) What is an ore body? Explain 'Metallogenic Province' in the background of occurrence of different ore deposits in the Singhbhum Craton. 3

(CO1, CO2, CO3, CO6)

- (b) "First-order control on localization of mineral deposits is tectonic setting". Explain 2

(CO1, CO2, CO3)

2. (a) What are the major ore-forming processes? Answer with examples. 3

(CO2, CO4, CO5)

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[Turn Over]

(2)

- (b) Explain the genetic relationship between magmas and mineral deposits. 1

(CO2, CO4, CO5)

- (c) Write the simplified classification of ultramafic-mafic bodies that are important for orthomagmatic ore deposits. 5

(CO2, CO4, CO5)

3. Write short notes on : (i) Layered Mafic Intrusion, (ii) Ophiolitic Complex and (iii) Origin of stratiform chromitites. 6

(CO3, CO4, CO5, CO6)

PART—II (20 Marks)

Answer *any four* questions : 5×4=20

1. Define the term ore mineral, ore, ore deposit and tonnage. What is cut-off grade? Briefly discuss the factors that control the cut-off grade of a deposit. CO1

2+1+2

2. What is connate water? How is this different from metamorphic water? Using suitable diagrams, explain the differences in the release of connate water during gradual burial of a sandstone and a shale. CO1

1+1+3

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[Continued]

(3)

3. Explain why I-type granites produce porphyry Cu-Mo deposits whereas S-type granites produce porphyry Sn-W deposits. Also, explain why porphyry Cu-Mo deposits are associated with extensive potassic alteration whereas porphyry Sn-W deposits are associated with extensive sodic alteration. CO2

2½+2½

4. “Fluid mixing is the most important mechanism of ore mineral precipitation in Volcanogenic Massive Sulfide (VMS) deposits” - accept or reject the statement with reasons. “VMS deposits often show vertical as well as lateral metal zoning” - explain the statement with relevant temperature- and pH-dependent solubility of Cu and Zn. CO2

2+3

5. What do you understand by the term “supergene enrichment”? “Presence of pyrite helps significantly in the formation of supergene enrichment” - accept or reject the statement with reasons. What is gossan? Using suitable reactions, explain how gossan form. CO2

1+1½+1+1½

6. “A large number of young porphyry deposits are concentrated along the western coast of North America and South America” - why? “Porphyry deposits are mostly restricted in rocks younger than 500 Ma” - why? Quartz Pebble Conglomerate (QPC) type uranium deposits are restricted mostly in rocks than 2022 Ma” - why? CO5

1+2+2

★ ★ ★

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